

Fishery Management Report No. 15-09

2013 Annual Management Report Norton Sound-Port Clarence Area and Arctic- Kotzebue Area

by

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Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the *Système International d'Unités* (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

| Weights and measures (metric) | | General | | Mathematics, statistics | |
|---|--------------------|--|---|---|-------------------------|
| centimeter | cm | Alaska Administrative Code | AAC | <i>all standard mathematical signs, symbols and abbreviations</i> | |
| deciliter | dL | all commonly accepted abbreviations | e.g., Mr., Mrs., AM, PM, etc. | alternate hypothesis | H_A |
| gram | g | all commonly accepted professional titles | e.g., Dr., Ph.D., R.N., etc. | base of natural logarithm | e |
| hectare | ha | at | @ | catch per unit effort | CPUE |
| kilogram | kg | compass directions: | | coefficient of variation | CV |
| kilometer | km | east | E | common test statistics | (F, t, χ^2 , etc.) |
| liter | L | north | N | confidence interval | CI |
| meter | m | south | S | correlation coefficient (multiple) | R |
| milliliter | mL | west | W | correlation coefficient (simple) | r |
| millimeter | mm | copyright | © | covariance | cov |
| | | corporate suffixes: | | degree (angular) | $^\circ$ |
| Weights and measures (English) | | Company | Co. | degrees of freedom | df |
| cubic feet per second | ft ³ /s | Corporation | Corp. | expected value | E |
| foot | ft | Incorporated | Inc. | greater than | > |
| gallon | gal | Limited | Ltd. | greater than or equal to | ≥ |
| inch | in | District of Columbia | D.C. | harvest per unit effort | HPUE |
| mile | mi | et alii (and others) | et al. | less than | < |
| nautical mile | nmi | et cetera (and so forth) | etc. | less than or equal to | ≤ |
| ounce | oz | exempli gratia | e.g. | logarithm (natural) | ln |
| pound | lb | (for example) | | logarithm (base 10) | log |
| quart | qt | Federal Information Code | FIC | logarithm (specify base) | log ₂ , etc. |
| yard | yd | id est (that is) | i.e. | minute (angular) | ' |
| | | latitude or longitude | lat or long | not significant | NS |
| Time and temperature | | monetary symbols (U.S.) | \$, ¢ | null hypothesis | H_0 |
| day | d | months (tables and figures): first three letters | Jan, ..., Dec | percent | % |
| degrees Celsius | °C | registered trademark | ® | probability | P |
| degrees Fahrenheit | °F | trademark | ™ | probability of a type I error (rejection of the null hypothesis when true) | α |
| degrees kelvin | K | United States (adjective) | U.S. | probability of a type II error (acceptance of the null hypothesis when false) | β |
| hour | h | United States of America (noun) | USA | second (angular) | " |
| minute | min | U.S.C. | United States Code | standard deviation | SD |
| second | s | U.S. state | use two-letter abbreviations (e.g., AK, WA) | standard error | SE |
| Physics and chemistry | | | | variance | |
| all atomic symbols | | | | population | Var |
| alternating current | AC | | | sample | var |
| ampere | A | | | | |
| calorie | cal | | | | |
| direct current | DC | | | | |
| hertz | Hz | | | | |
| horsepower | hp | | | | |
| hydrogen ion activity (negative log of) | pH | | | | |
| parts per million | ppm | | | | |
| parts per thousand | ppt, ‰ | | | | |
| volts | V | | | | |
| watts | W | | | | |

FISHERY MANAGEMENT REPORT NO. 15-09

**2013 ANNUAL MANAGEMENT REPORT
NORTON SOUND-PORT CLARENCE AREA AND ARCTIC-KOTZEBUE
AREA**

By

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ABSTRACT

This report provides information about the 2013 commercial and subsistence fisheries of Norton Sound-Port Clarence and Arctic-Kotzebue management areas of the Arctic-Yukon-Kuskokwim Region of the Alaska Department of Fish and Game, Division of Commercial Fisheries. The management areas consist of all waters from Point Romanof north of the Yukon River and west of 141 degrees W longitude and those waters draining into the Bering Sea north of Yukon River; the Chukchi Sea, Beaufort Sea and Arctic Ocean. Commercial and subsistence fisheries target 5 species of salmon (Chinook *Oncorhynchus tshawytscha*, sockeye *O. nerka*, chum *O. keta*, coho *O. kisutch*, and pink *O. gorbuscha* salmon), Pacific herring *Clupea pallasii*, red king crab *Paralithodes camtschaticus*, and miscellaneous species such as inconnu (sheefish) *Stenodus leucichthys*, whitefish *Coregonus laurettae*, Dolly Varden *Salvelinus malma*, saffron cod *Eleginus gracilis*, and capelin *Mallotus villosus*.

Key words: Norton Sound, Port Clarence, Kotzebue Sound, Arctic, subsistence, commercial fishery, management, escapement, salmon, Chinook salmon *Oncorhynchus tshawytscha*, chum salmon *Oncorhynchus keta*, coho salmon *Oncorhynchus kisutch*, pink salmon *Oncorhynchus gorbuscha*, sockeye (red) salmon *Oncorhynchus nerka*, red king crab *Paralithodes camtschaticus*, Pacific herring *Clupea pallasii*, inconnu sheefish *Stenodus leucichthys*, whitefish *Coregonus laurettae*, *Coregonus pidschian*, *Coregonus sardinella*, *Coregonus nasus*, Dolly Varden *Salvelinus malma*, saffron cod *Eleginus gracilis*, Annual Management Report (AMR), Fishery Management Report (FMR).

INTRODUCTION

This report summarizes the 2013 season and historical information concerning management of the commercial and subsistence fisheries of Norton Sound-Port Clarence, Arctic-Kotzebue management areas of the Arctic-Yukon-Kuskokwim Region. Data from select management and research projects are included in this report. A more complete documentation of project results is presented in separate reports. Historical harvest and escapement information in this report goes back to 1990. For information prior to 1990 see Menard et al. 2013.

Data presented in this report supersede information found in previous management reports. An attempt has been made to correct errors present 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) Management Area Overviews
- 2) Salmon Fisheries
- 3) Pacific Herring Fisheries
- 4) King Crab Fisheries
- 5) Miscellaneous Species

Tabular data have been separated into 2 categories to facilitate use of this report: 1) Tables 1–13 present annual data, and 2) Appendices generally present historical comparisons. Not all appendices are cited in the text, and those that are cited are not necessarily cited in order.

SECTION 1: MANAGEMENT AREA OVERVIEWS

BOUNDARIES

Norton Sound-Port Clarence Area and Arctic-Kotzebue Area include all waters from Point Romanof in southern Norton Sound and St. Lawrence Island and west of 141 degrees W longitude, to the U.S.-Canada border (Figure 1). This area encompasses over 100,000 mi², and has a coastline exceeding that of California, Oregon, and Washington combined. For crab management the southern boundary is Cape Romanzof.

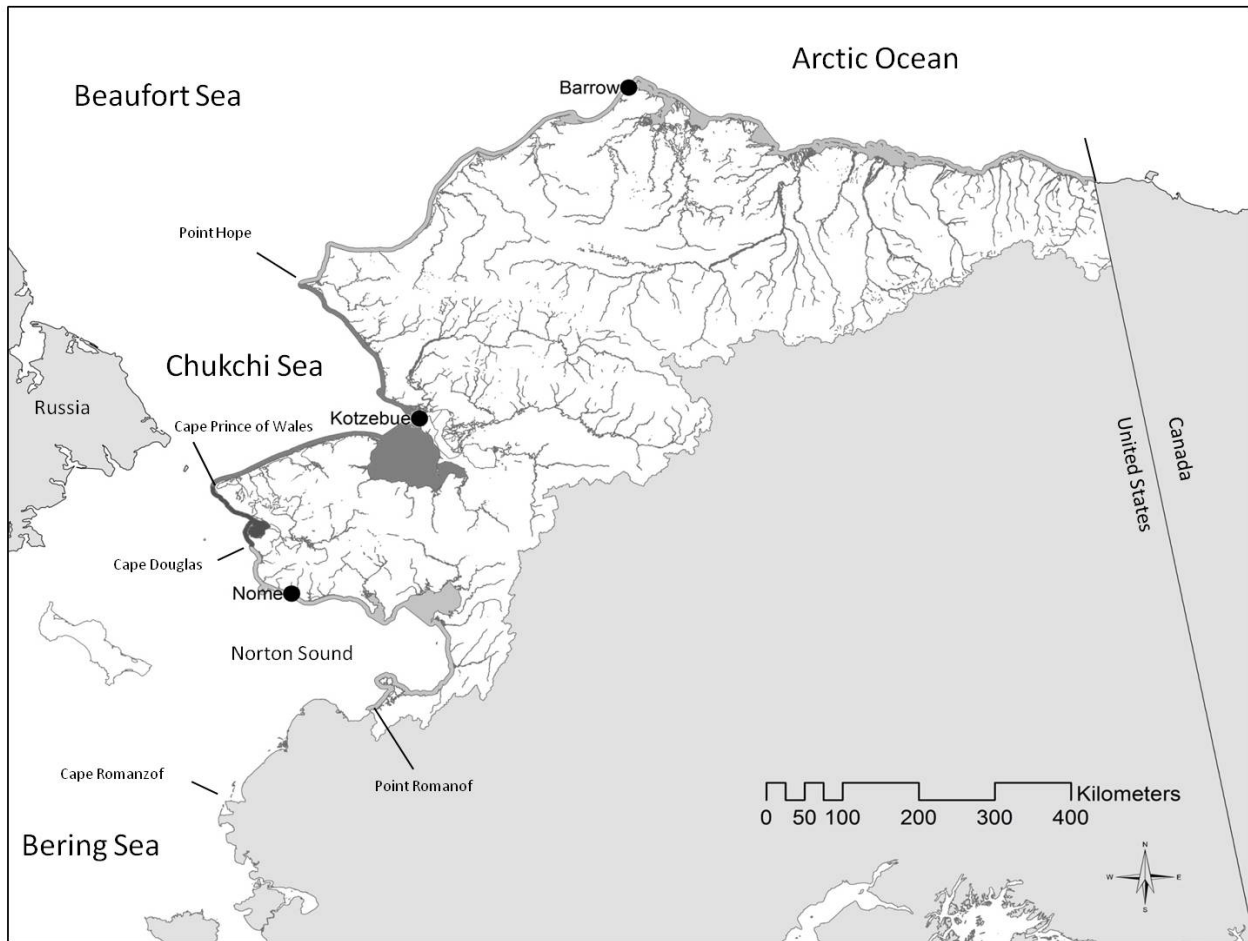


Figure 1.—Norton Sound, Port Clarence, Kotzebue Sound, and Arctic management districts.

SALMON OVERVIEW

There are 5 species of Pacific salmon indigenous to the area; however, chum *Oncorhynchus keta* and pink salmon *O. gorbuscha* historically are the most abundant. Chum and Chinook (king) salmon *O. tshawytscha* are found as far north as Barrow, but they are less common north of the Kotzebue Sound drainages. The northernmost large concentrations of chum salmon are found

within Kotzebue Sound drainages, but large numbers of 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. Pink salmon have been observed by aerial survey in increasing numbers in rivers north of Point Hope to Barrow. Small numbers of chum, pink, sockeye, and Chinook salmon have been reported by subsistence fishermen along the Arctic coast.

COMMERCIAL SALMON 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, Port Clarence, and Kotzebue districts. Historically, ADF&G has supported liberalizing various regulations by encouraging processors to explore and develop new fishing grounds since statehood. As a result, commercial salmon fishing activity grew significantly in the region and enabled some local residents to obtain cash income.

Currently, most commercial fishermen and many buying station workers are resident Native Alaskans (Yupik, Inupiat, and Siberian Yupik). Commercial fishermen operate set gillnets from outboard powered skiffs, and all commercial caught salmon are harvested in coastal marine waters.

There is no commercial salmon fishery in the Arctic District.

SUBSISTENCE SALMON FISHERY

There are approximately 23,000 people in the area, the majority of whom are Native Alaskans residing in more than 40 small villages scattered along the coast and major river systems. Nearly all local residents are dependent to varying degrees on fish and game resources for their livelihoods.

Subsistence fishermen operate gillnets or seines in the main rivers and to a lesser extent in coastal marine waters to harvest salmon. Beach seines are used to catch schooling or spawning salmon and other species of fish. The major portion of fish taken during summer months is air-dried or smoked for later consumption by residents or occasionally their dogs.

Historical subsistence harvest information is discontinuous. Prior to 1960, subsistence data are either incomplete or entirely lacking. From the early 1960s until 1982, ADF&G conducted annual household surveys in communities with major salmon fisheries. In 1983, budgetary restrictions made it impossible to conduct surveys in each Norton Sound village, so surveys in many areas were suspended until 1994, when ADF&G initiated a new annual postseason household subsistence salmon harvest survey program. This program was also cut after the 2003 season in Norton Sound and after 2004 in Kotzebue Sound due to budget constraints. However, expansion of subsistence salmon permits in 2004 to Port Clarence District (affecting the communities of Teller and Brevig Mission), and Norton Sound Subdistricts 2 and 3 (affecting the communities of Council, White Mountain, Golovin, and Moses Point/Elim) has resulted in fewer household surveys because subsistence harvests for those communities are now reported through subsistence permits.

Also, in 2004, the Division of Commercial Fisheries began doing subsistence salmon household surveys annually in Shaktoolik and Unalakleet (and in Koyuk starting in 2008) and in other southern Norton Sound villages periodically. Surveyors attempt to contact all households.

ADF&G staff members use a community household list and each year update any new households and delete those no longer there. Salmon survey data are expanded to include those households that usually fish but ADF&G was unable to contact.

Prior to the fishing season, ADF&G personnel usually make one visit to each village to issue subsistence salmon fishing permits. Villagers can also call the Nome office toll free, and a permit will be mailed or faxed when possible. Village residents are able to mail completed permits to the Nome office postage free. Attempts are made to contact, by phone or letter, all permit holders who did not return their household permit. Also, trips to villages are made postseason by ADF&G personnel to collect permits and discuss the fishing season.

In 2008, a cooperative project was initiated and is ongoing (ADF&G Divisions of Commercial Fisheries, Habitat, and Subsistence; and North Slope Borough Department Wildlife Management and Planning) to assess Pacific salmon resources in the Arctic District. Components of the project include 1) documenting subsistence salmon fishing patterns such as species targeted, fishing gear and methods, harvest timing, local salmon abundance and run timing, historical knowledge, and observations of spawning locations; 2) conducting aerial surveys to document adult salmon distribution in river systems and determine which rivers could be used as index areas for future monitoring; and 3) acquiring age, sex, length and genetic samples for salmon.

SALMON MANAGEMENT

The Division of Commercial Fisheries of ADF&G is responsible for management of commercial and subsistence fisheries in this vast area. Permanent full-time staff assigned to this area during 2013 consisted of an Area Management Biologist, an Assistant Area Management Biologist, a Research Biologist, and a 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, Port Clarence, and Kotzebue Sound. Biologists from regional staff provided additional assistance. In 2013, interns funded by Norton Sound Economic Development Corporation (NSEDC) were utilized as fisheries technicians at some projects. There are 5 cooperative projects staffed by NSEDC and 2 projects jointly operated by NSEDC and ADF&G in Norton Sound that supplemented salmon escapement monitoring activities of area staff.

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

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

The cornerstone regulation that governs commercial salmon harvest in all districts is the scheduled weekly fishing period. Commercial salmon fishing regulations allow for variable fishing periods 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 run. Occasionally, fishing time is increased or decreased by emergency order. Emergency orders issued in 2013 are listed in Appendix G9. 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 with fishery status and schedules are broadcast during the fishing season over radio stations KICY and KNOM in Nome, and fishery news articles are published in the *Nome Nugget* and *Arctic Sounder*.

NORTON SOUND SALMON OVERVIEW

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 6 subdistricts and corresponding statistical areas: Subdistrict 1, Nome (333-10); Subdistrict 2, Golovin (333-20); Subdistrict 3, Elim (333-31, 32, 33); Subdistrict 4, Norton Bay (333-40); Subdistrict 5, Shaktoolik (333-50); and Subdistrict 6, Unalakleet (333-60). The subdistrict and statistical area boundaries were established to facilitate management of individual salmon stocks, and each subdistrict contains at least 1 major salmon-producing stream (Figure 2).



Figure 2.–Norton Sound commercial salmon fishing subdistricts.

All commercial salmon fishing in the district is by set gillnets in marine waters; however, 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 in September. Pink salmon are much more abundant in even-numbered year returns. A pink salmon directed fishery may coincide with or may be scheduled to alternate periods with the historical chum salmon directed fishery.

Salmon management had changed significantly since the mid-1990s because of limited market conditions and marginal returns of several salmon stocks within the district; however, rebounding salmon returns in the mid-2000s resulted in renewed buyer interest. There had been no commercial interest in pink salmon from 2000 to 2006, but beginning in 2007 there was some commercial fishing to harvest a small portion of the pink salmon run. Also, since 2007 there has been renewed buyer interest in Golovin and Elim Subdistricts and since 2008 in Norton Bay Subdistrict. Commercial fishery managers use estimates of run strength from escapement counting projects, test fishing, aerial surveys, and commercial fishing indexes. 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 (Bockstoe 1979). The largest precontact 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 usually disperse in groups composed of 1 or 2 families and set up camps near the mouths of streams. Harvest levels of fish on any 1 stream were relatively small because of low concentrations of people who caught only what their families and 1 or 2 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 affected fish populations significantly. Nearly every stream on the Seward Peninsula has had some sort of mining operation, ranging from simple gold panning or sluice boxes to hydraulic giants or 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 the large number of people who came to live in the region between 1900 and 1930. Communities like Nome, which had a population of 30,000, and Council, which had 10,000 residents, did not exist before gold was discovered.

In the late nineteenth century the size of dog teams increased from 2 or 3 to as many as 10 to 20. 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 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; 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 2 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 \$0.10 per lb from the fishermen. One elder in the area thought fishermen retained more fish for their own use, which may have averaged 5 to 10 bundles per household, compared to the amount sold (Thomas 1982).

The number of people gradually decreased over the next 20 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, and the last dog-team mail contract ended in 1962 at Savoonga. However, local stores continued to trade and barter in dry fish at Shaktoolik, St. 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 \$0.06 per lb and then sell them for \$0.10 per lb or their equivalent in groceries and supplies (Thomas 1982). By the early 1960s, commercial salmon fishing developed into a source of summer cash and snow machines 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 began in Shaktoolik and Unalakleet Subdistricts in 1961. Most 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 Golovin. 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 midseason in 1988. Two Japanese freezer ships were permitted to buy directly from domestic fishermen limited to salmon caught in the internal waters of Golovnin and Norton Bays. The most consistent markets are at Shaktoolik and Unalakleet, and onshore processing occurs at Unalakleet. Appendix G3 provides a list of commercial processors and buyers that operated in Norton Sound and Kotzebue Sound in 2013.

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 terminated their operations before regulatory closure dates in the past. However, during recent years Norton Sound Seafood Products (NSSP) has remained operational until the regulatory fishing season closure. Commercial fishing periods are set by emergency order. No commercial salmon fishing periods occurred in the Nome Subdistrict 1997–2012 because of regulatory restrictions on chum salmon, lack of buyer interest, or weak runs. In 2013, limited commercial fishing occurred for chum and pink salmon (Appendix A6).

Commercial fishing gear is restricted to gillnets. A maximum aggregate length of 100 fathoms is allowed for each fisherman and there are no depth restrictions. However, mesh size is often

restricted in an attempt to direct harvest toward a specific species of salmon. Fishing periods restricted to 6.0 in and smaller mesh gillnets are used to target chum and coho salmon. Most gillnets fished are approximately 5.875-inch stretched mesh. In Unalakleet and Shaktoolik Subdistricts, 8.25-inch stretched mesh gillnets are commonly used if there are Chinook salmon fishing periods in June through early July. During years when large pink salmon runs occur and there is a buyer, ADF&G establishes fishing periods allowing only 4.5-inch mesh or less to be used. These special small-mesh periods are an attempt to target pink salmon while reducing harvest of larger sized salmon species.

COMMERCIAL FISHERY MANAGEMENT

Norton Sound District is managed on comparative commercial catch data, escapements, and weather conditions. A combination of factors are considered before managers issue emergency orders affecting seasons, fishing periods, allowable mesh size, and fishing areas.

Aerial surveys are used to monitor escapements in most Norton Sound streams. Weather conditions, time of day, type of aircraft, water and bottom conditions, date of survey, and efficiency of surveyor and pilot must be taken into account when making interannual aerial survey comparisons. Counting towers and weirs are a more consistent and accurate method of obtaining migration information and have been utilized on several river systems in Norton Sound. In 2013, there were 3 counting towers and 7 weirs in operation. One sonar project was operated on the Shaktoolik River, but the project was still in development and was not used for inseason management.

Early management emphasis is on Chinook salmon switching to chum salmon around July 1, and then gradually shifting to coho salmon during the fourth week in July. Pink salmon are abundant during even-numbered years, but often no buyer is available for this species except as incidentally caught fish when there are other salmon directed fisheries. Coho salmon catches have remained fairly stable in recent years, although they have dropped from the record levels seen in Norton Sound in the mid-2000s. Chum salmon catches have been rebounding in recent years. Management actions have consisted of a series of emergency orders that open and close fishing seasons and periods and establish gillnet mesh size specifications.

Commercial fisheries in Golovin and Elim Subdistricts have targeted chum salmon and during even-numbered years pink salmon in June and July, and coho salmon in late July and August. Commercial chum salmon harvests have dropped dramatically since the mid-1980s. Poor chum salmon runs resulted in restrictive management actions during the late 1990s and early 2000s, but in the mid-2000s there was little market interest even as runs began to rebound. However, continued improving chum salmon runs in the late 2000s in Norton Sound has sparked renewed buyer interest in the northern subdistricts.

Little or no commercial salmon harvest had occurred in Nome and Norton Bay Subdistricts since the early 1980s. Nome Subdistrict has had very depressed chum salmon stocks that, until the mid-2000s, had required closure or severe restrictions of the subsistence fishery. Although salmon runs have improved greatly with record runs of pink and coho salmon in recent years and the best chum salmon runs since the 1980s, Nome Subdistrict had been unable to attract a buyer for pink and coho salmon until recently and was closed to commercial chum salmon fishing by regulation until 2013. The Norton Bay Subdistrict often has healthy stocks, but it had been unable to attract markets willing to operate in this remote area until recently. Since 2008, improving market conditions resulted in NSSP bringing more tenders to the subdistrict, and

commercial salmon fishing has resumed in Norton Bay. Commercial salmon harvest for Norton Sound in 2013 by subdistrict is listed in Table 1.

SUBSISTENCE FISHERY OVERVIEW

Norton Sound District subsistence salmon harvest surveys have been conducted sporadically since statehood. From 1994 through 2003, ADF&G conducted an annual subsistence postseason salmon harvest assessment effort in northwest Alaska to provide more extensive, complete, and reliable salmon harvest estimates than had previously existed. These household subsistence harvest surveys were primarily funded by ADF&G Division of Commercial Fisheries and were conducted by the Division of Subsistence during the fall in 8 villages (Brevig Mission, Teller, Golovin, White Mountain, Elim, Koyuk, Shaktoolik, and Unalakleet). In 2004, surveys were replaced by permits in most of northern Norton Sound. Over the last 10 years in Norton Sound Subdistricts 1–6 (2003–2012), the average subsistence harvest was 70,149 salmon, with the majority being pink salmon (Appendix A13). However, from 2004 to 2007, the village of Koyuk was not surveyed, and therefore no harvest data from Norton Bay Subdistrict are included for those years.

Two goals of the postseason household subsistence survey are to collect harvest data to estimate subsistence salmon catch by species and community, and to compile information on gear types, participation rates, sharing, use of salmon for dog food, and household size. A copy of the Norton Sound subsistence salmon harvest survey form is shown by village in Appendices G4–G6.

In 2004, ADF&G’s subsistence salmon harvest assessment program changed substantially when household surveys were discontinued in most communities because the household subsistence permit system was expanded from Nome to include Port Clarence District (affecting the communities of Teller and Brevig Mission) and Norton Sound Subdistricts 2 and 3 (affecting the communities of Council, White Mountain, Golovin, and Elim). Thereafter, subsistence salmon harvest for those communities are reported totals from subsistence permits, so household surveys have not been necessary. Permits issued at the Nome office, and by ADF&G personnel in the field, identify gear restrictions, bag limits, subsistence zones (for Subdistrict 1, Salmon Lake and Pilgrim River only), location and access descriptions, and subsistence regulations for each location or body of water. In addition, the permit contains a catch calendar for household members to record gear type used, area fished, and catch in numbers by species for each day fished. If subsistence fishermen reach their harvest limit in one river, they can fish in other rivers until they reach the limit in those rivers. Subsistence permits are important to management because they identify users, fishing effort, harvests, and limits. Subsistence salmon harvests for the current year in northern Norton Sound are listed in Table 2.

In Subdistrict 1 (Nome), low salmon stock levels combined with a large concentration of users has required subsistence fishing permits since 1975. By regulation, permits with catch calendars are issued to each requesting household listing all Nome Subdistrict fishing locations, catch limits, and gear restrictions. After the fishing season, households are required to return the completed permit to ADF&G, whether or not they actually fished. Due to the subsistence permit program, all subsistence salmon catches from Norton Sound Subdistrict 1 have been determined from returned permits since 1975. However, not all fishermen obtained or returned permits from 1975 to 2003, and the data were not expanded for unreturned permits because the assumption was that those permit holders did not fish. Beginning in 2004, stricter enforcement of regulations

including fines for failure to return a permit resulted in nearly 99% of all permits issued being returned, and since 2010, all subsistence salmon permits issued have been returned or permit holders have reported catches in person, by telephone, or by email.

Norton Bay, Shaktoolik, and Unalakleet Subdistricts have continued to be surveyed postseason by household interviews. Additionally, daily surveys of Unalakleet River and ocean subsistence fishermen have been conducted annually during the Chinook salmon run since 1985. Although total harvests by subsistence fishermen were not documented, effort and catch information were used to judge timing and magnitude of the Chinook salmon return. The commercial fishery is delayed until it becomes apparent subsistence needs are being met and Chinook salmon are beginning their upstream migration as indicated by ADF&G test net in lower Unalakleet River.

HISTORICAL REGULATORY ACTIONS IN NORTON SOUND SUBDISTRICTS

Nome Subdistrict (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 Nome Subdistrict 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 may have intercepted nonlocal stocks. A 1978–1979 Norton Sound stock separation study (Gaudet and Schaefer 1982) showed that some salmon tagged near Nome were recaptured 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 Alaska Board of Fisheries (BOF), in response to an advisory committee petition, directed ADF&G to manage the Nome Subdistrict commercial fishery for optimal chum salmon escapement after poor chum salmon escapements during the 1982 and 1983 seasons. During 1984 fall BOF 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 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 regulation 5 AAC 04.360. In addition to these restrictions, a proposal to restrict sport fishery in Nome and Snake rivers was adopted in 1984 that allowed “a bag and possession limit of 15 salmon, other than Chinook salmon, of which 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 fishing were restricted. Even with such

drastic fishery restrictions, escapement goals for chum salmon were not attained during 1987 in 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 BOF in 1987 restricting gillnet length and mesh size in the subsistence fishery. Beach seine use in specific waters in the subsistence fishery was also eliminated.

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. Regulation changes in 1992 affected the use of beach seines for subsistence fishing in Nome Subdistrict. Managers were given authority to permit subsistence harvest of chum or pink salmon by beach seine if escapement needs were likely to be met. 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.

Through a series of BOF-directed meetings, BOF concluded that the previous management plan did not provide adequate opportunity for all subsistence salmon users to supply their annual needs for chum salmon. Therefore, Nome Subdistrict was designated a Tier II subsistence chum salmon permit fishery during a special BOF meeting held in Nome, March 1999. Tier II permits are dispensed to individuals prioritized by fishing history and dependence and are based on projected harvestable surplus. As a result, ADF&G allowed 20 individuals who scored highest on the Tier II application process in 1999 to subsistence fish. The intent was to allow Tier II permit holders first priority over other subsistence users if only a small harvestable surplus of chum salmon returned. If the run was assessed to be strong, then the subsistence fishery would open to all Alaskan residents who obtain a Tier I permit and individual harvests would be restricted to prescribed bag limits. In addition, BOF 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 6 Nome Subdistrict streams into regulation. In 1999, due to poor chum salmon returns, ADF&G closed even the Tier II fishery, and in 2000, only 10 Tier II permits were issued.

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

Based upon the stock of concern determinations, BOF made several changes to regulations for management of Norton Sound salmon. In January 2001, BOF repealed the existing biological escapement goals (BEG) in regulation and adopted optimal escapement goals (OEG) for chum salmon for 5 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 OEGs are in actual number of fish and based on ADF&G escapement goal analysis (Clark 2001). For rivers where an escapement project (tower or weir) are operated, 4 of 5 OEGs were established. BOF established OEGs, by subdistrict, are as follows:

Nome 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

Elim Subdistrict (Subdistrict 3)

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

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

A chum salmon management plan for Nome Subdistrict (Subdistrict 1) and a salmon management plan for Golovin and Elim Subdistricts (Subdistricts 2 and 3) were adopted by BOF. 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 4 consecutive years.

ADF&G was given authority to establish subsistence gillnet mesh size restriction of 4.5 in or less by emergency order when necessary to conserve chum salmon in Subdistricts 1, 2, and 3. Also, the Cripple and Penny rivers were closed to subsistence fishing for chum salmon.

In addition, BOF expanded legal gear for the subsistence fishery to include a line attached to a rod or pole, from Cape Espenburg on the northern Seward Peninsula along the coast to Bald Head (between Elim and Koyuk). Bald Head is the boundary between Subdistricts 3 and 4. Therefore, west of Cape Espenburg in the Kotzebue District, in Port Clarence District, and in Norton Sound District from Cape Douglas to Bald Head, hook and line became legal subsistence gear. Although hook and line can be used for subsistence fishing, sport fish methods and means requirements still apply to harvesting of fish (for example, no snagging of fish is allowed). Sport fish bag and possession limits, by species, as specified in regulation 5 AAC 70.022 also apply, except when fishing through ice or in the Nome Subdistrict subsistence areas designated for each river. However, fishermen cannot combine sport fish bag and possession limits with subsistence harvest permit limits.

In 2001, chum salmon runs began to improve in Nome Subdistrict and additional permits were issued in the Tier II chum salmon fishery. Beginning in 2004, BOF expanded the salmon subsistence permit requirement for the Norton Sound area to include all marine waters, and fresh waters flowing into marine waters from Cape Prince of Wales to Bald Head. This regulation required salmon permits to be issued in Brevig Mission, Teller, White Mountain, Golovin, and Elim in addition to Nome.

Improving chum salmon runs in Nome Subdistrict resulted in Tier II chum salmon fishery restrictions being suspended beginning in 2006. A permit is still required for subsistence salmon fishing, but there is no longer a Tier II fishery that restricts participation in subsistence fishing. In addition, the BOF allowed commercial chum salmon fishing beginning in 2013.

Regulatory actions were also undertaken in other subdistricts. Subdistricts 5 and 6 Chinook salmon were designated a stock of yield concern in 2004, and BOF continued this designation in 2007 and 2010. To increase Chinook salmon escapements, BOF also adopted a more conservative *Subdistricts 5 and 6 King Salmon Management Plan* (5 AAC 04.395) that was first implemented during the 2007 season. Under the new plan, commercial fishing directed at Chinook salmon can only occur if the midpoint of the North River tower SEG range is projected to be reached. Additionally, the plan directs ADF&G to provide escapement windows by

restricting subsistence gillnet fishing for salmon from mid-June to mid-July to two 48-hour fishing periods a week in marine waters, and two 36-hour fishing periods a week in Unalakleet River. Subsistence fishing time can only be liberalized if the department projects that the lower end of the SEG range will be achieved. If North River Chinook salmon passage is projected to fall short of the SEG, ADF&G is directed to close the Chinook salmon fishery.

PORT CLARENCE SALMON OVERVIEW

DISTRICT BOUNDARIES

Port Clarence District encompasses all waters from Cape Douglas north to Cape Prince of Wales including Salmon Lake and Pilgrim River drainages (Figure 3). Salmon, saffron cod *Eleginus gracilis*, whitefish, and herring *Clupea pallasii* are the major subsistence species.

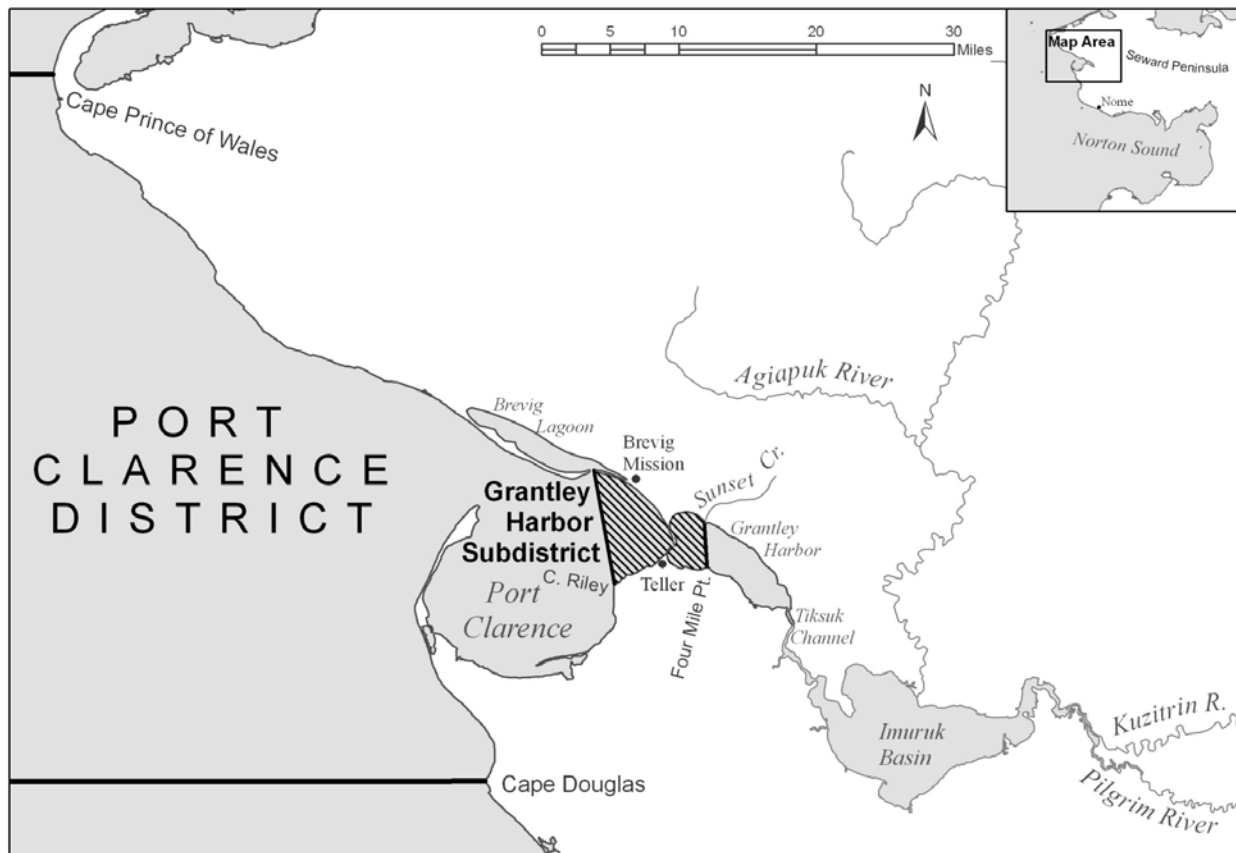


Figure 3.—Port Clarence District.

Note: Cross-hatched area on map shows location where commercial salmon fishing may be opened.

COMMERCIAL FISHERY OVERVIEW

In contrast to Norton Sound District, commercial fishing has been limited in Port Clarence District. In 1966, a commercial salmon fishery was established in the Grantley Harbor/Tuksuk Channel area of the Port Clarence District, but the fishery that year yielded less than 2,300 combined chum, pink, and sockeye salmon (Menard et al. 2013). It was closed later that same season, due to small salmon runs and concerns from local residents about impacts to area subsistence salmon fisheries, and had remained closed until relatively recently. In the mid-2000s, there were large increases in sockeye salmon runs as well as positive results from an ADF&G

test fishery in 2006. Consequently, in 2007, the BOF reestablished by regulation a Port Clarence District commercial salmon fishery. The BOF also established an inriver run goal of at least 30,000 sockeye salmon as a trigger point to allow a commercial fishery. The 2007 fishery harvest was 1,152 sockeye salmon, and 3,183 chum salmon, whereas the 2008 fishery harvest was 89 sockeye salmon, 256 chum salmon, and 910 pink salmon (Menard et al. 2010). The 2008 commercial fishery was closed when the inriver goal of 30,000 sockeye salmon for Pilgrim River was projected to fall short. The commercial fishery has remained closed since 2009 because of poor runs of sockeye salmon.

SUBSISTENCE FISHERY OVERVIEW

Salmon Lake, which empties into the Pilgrim River in the Port Clarence District, along with Glacial Lake in the northwestern portion of the Nome Subdistrict, supports the northernmost sockeye salmon populations of significant size in North America. Subsistence harvests of sockeye salmon in the Sinuk River, which drains Glacial Lake, have historically been low due to difficulties navigating this shallow, boulder-laden river. In contrast, sockeye salmon harvests in the Pilgrim River are much higher because it is more easily traveled and several beach seining and set gillnet fishing locations are accessible via the Kougarok Road (Nome–Taylor Highway) emanating from Nome. 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 fishermen of Brevig Mission fish northern and northeastern sections of Port Clarence District, and Teller fishermen utilize Grantley Harbor and Tuksuk Channel. Interviews with local residents indicated substantial fishing effort within Agiapuk River.

Beginning in 2007, regulations allowed for cash sales of up to \$200 worth of subsistence-taken finfish per household, per year, in the Norton Sound–Port Clarence Area only, and starting in 2013 the amount allowed was raised to \$500. From 2007 to 2012, 5 or less customary trade finfish permits were issued per year. Sales in most years were confidential because less than 4 permits were issued (Appendix A34).

Village subsistence surveys were conducted annually by the Division of Commercial Fisheries until 1983 (Appendix B3). The Division of Subsistence conducted a partial survey of Brevig Mission in 1989 and conducted full-scale household surveys of both villages from 1994 to 2003. Since expansion of the subsistence salmon permit program in 2004, subsistence salmon harvests for residents of Teller and Brevig Mission have been determined from reported totals on permits.

Salmon Lake and Pilgrim River stocks have been fished by Nome residents in addition to residents of Brevig Mission and Teller for quite some time. To conserve declining sockeye salmon stocks, BOF adopted a regulation in 1972 to close Salmon Lake and its tributaries to subsistence salmon fishing from July 15 through August 31. However, because Pilgrim River is accessible from the road system there has been increased fishing effort from Nome area residents due to increased fishing restrictions in Nome Subdistrict beginning in the 1990s (Figure 4) and more so in the mid-2000s when there were record runs of sockeye salmon to Salmon Lake.

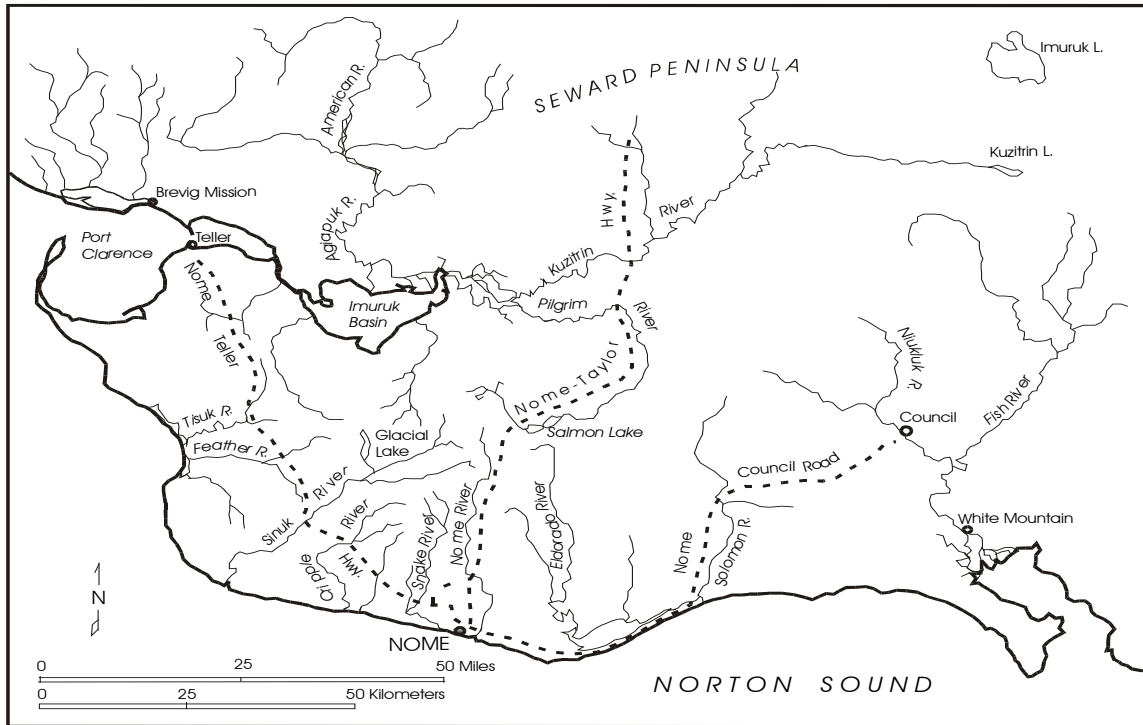


Figure 4.—Seward Peninsula with road-accessible waters.

From 1997 to 2001, ADF&G conducted a fertilization program at Salmon Lake, partially funded by NSEDC and the Bureau of Land Management (BLM) to restore sockeye salmon to historical levels by applying liquid fertilizer. However, ADF&G could not determine whether the method was effective and suspended fertilization in 2001. After impressive 2003 sockeye salmon returns, the project was reevaluated and fertilizer was applied at a reduced rate in 2004, stopped again in 2005 and 2006, restarted in 2007 by NSEDC, and has continued in subsequent years (Appendix B4).

KOTZEBUE SALMON OVERVIEW

DISTRICT BOUNDARIES

Kotzebue Sound District encompasses all waters from Point Hope to Cape Prince of Wales, including those waters draining into the Chukchi Sea (Figure 5). Salmon, saffron cod, whitefish, and herring are major subsistence species.

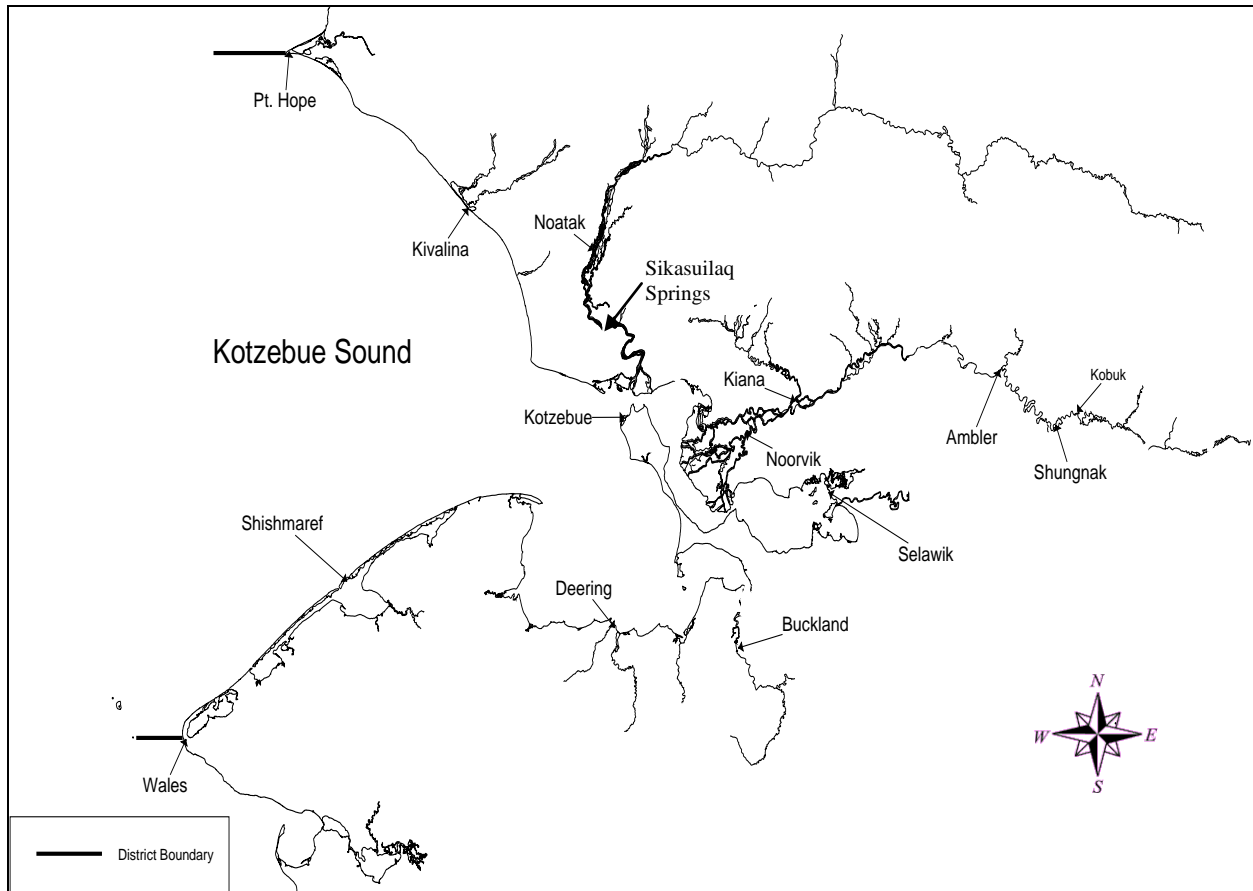


Figure 5.—Kotzebue Sound District, villages and subsistence fishing area.

COMMERCIAL FISHERY OVERVIEW

Kotzebue Sound District supports the northernmost commercial salmon fishery in Alaska. Kotzebue Sound District is divided into 3 subdistricts. Subdistrict 1 has 6 statistical areas where commercial salmon fishing may occur (Figure 6).

The commercial fishery under state management opened in 1962. Salmon harvests consist primarily of chum salmon, although limited amounts of Dolly Varden and a few Chinook, sockeye, pink, and coho salmon are harvested during the salmon fishery.

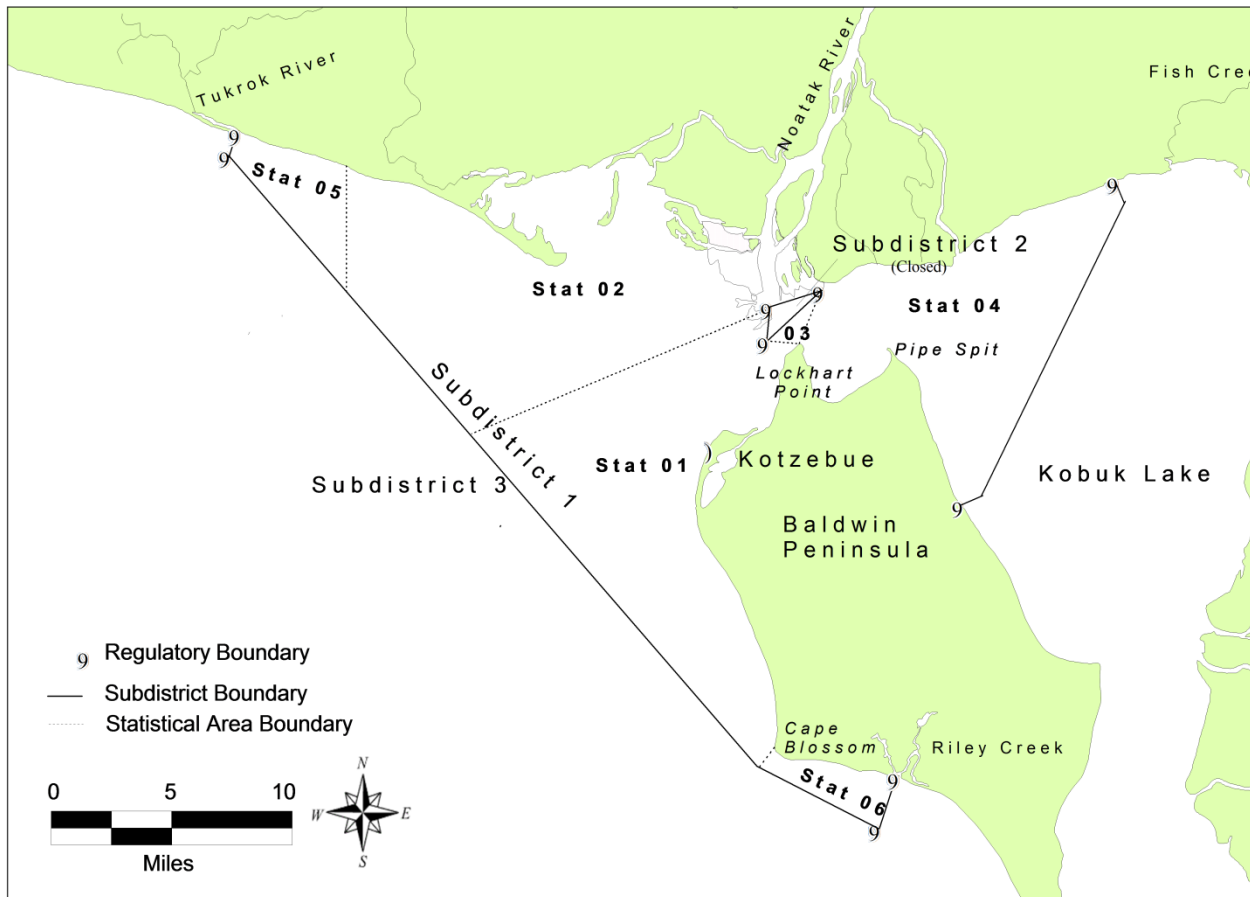


Figure 6.—Kotzebue Sound commercial salmon fishing subdistricts and statistical areas.

The earliest documented sales of salmon in Kotzebue District were in 1909 when Lockhart’s store purchased 21,906 lb of salmon from local Native Alaskans and resold it at \$0.05/lb. Of those sales, 21,366 lb were sold to gold miners on the Kobuk River drainage and 540 lb were sold to a company in Seattle. A commercial fishery occurred from 1914 to 1918. Salmon were canned and the bulk of the harvest is assumed to have been sold to miners who worked in the upper Kobuk River drainage. The next organized commercial fishery began under state management in 1962 and continues to the present. The current fishery became fully developed in the mid-1970s. The fishery displayed a gradually declining pattern of overall run strength with 4-year cycles of stronger returns followed by weaker returns (Appendix C1). In 1987, the fisheries managers’ new program emphasized attaining escapement goals. Before 1987, harvests were proportional to total return. Since 1995, poor market conditions and/or limited buyer capacity have caused harvests to fall short of their potential.

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

SUBSISTENCE FISHERY OVERVIEW

Subsistence salmon fishing in Kotzebue Sound District continues to be important, but fish abundance and fishing activities vary from community to community. Along the Noatak and Kobuk rivers where chum salmon runs are strong, household subsistence activities in middle and late summer revolve around catching, drying, and storing salmon. In southern Kotzebue Sound, fewer salmon are taken for subsistence because of low availability. Some fishermen base their fishing effort out of their village, while others move seasonally to fish camps where they stay for several days to several weeks. The predominant species in the district is chum salmon, although small numbers of other salmon species are present.

Historical subsistence surveys for the Kotzebue area have been less complete than for Norton Sound and Port Clarence Districts. However, expanded documented surveys from 1995–2004 result in an estimated total subsistence salmon harvest for the Kotzebue Sound area to be 57,977 annually (Appendix C5). During these years, ADF&G Division of Subsistence (DOS) conducted annual household subsistence salmon surveys in select Kotzebue District communities. Due to budget constraints these surveys were discontinued in 2005 but were restarted in 2012, when comprehensive subsistence fish harvest data were again collected from Kotzebue area villages by DOS. The town of Kotzebue was surveyed in 1995–2001 using a mail-in postcard but has not been surveyed since.

ARCTIC SALMON OVERVIEW

DISTRICT BOUNDARIES

The Arctic District includes all waters of Alaska north of the latitude of the western most tip of Point Hope and west of 141 degrees W longitude, including those waters draining into the Chukchi Sea, Beaufort Sea, and Arctic Ocean (Figure 7).

SUBSISTENCE FISHERY OVERVIEW

There are no commercial salmon fisheries in the Arctic District. Small numbers of chum, pink, and Chinook salmon have been reported by subsistence fishermen along the Arctic coast, with pink salmon being the most numerous and then chum salmon (Craig George, North Slope Borough, senior wildlife biologist, personal communication). Salmon are caught in gillnets as an incidental species when subsistence fishermen are targeting other non-salmon finfish. In October 2012, a fisherman caught 2 sockeye salmon in Ikroavik Lake, approximately 5 miles south of Barrow, subsistence fishing with gillnets under the ice targeting least cisco (Geoff Carroll, ADF&G, Barrow; personal communication). There are no reliable reports of coho salmon being caught.

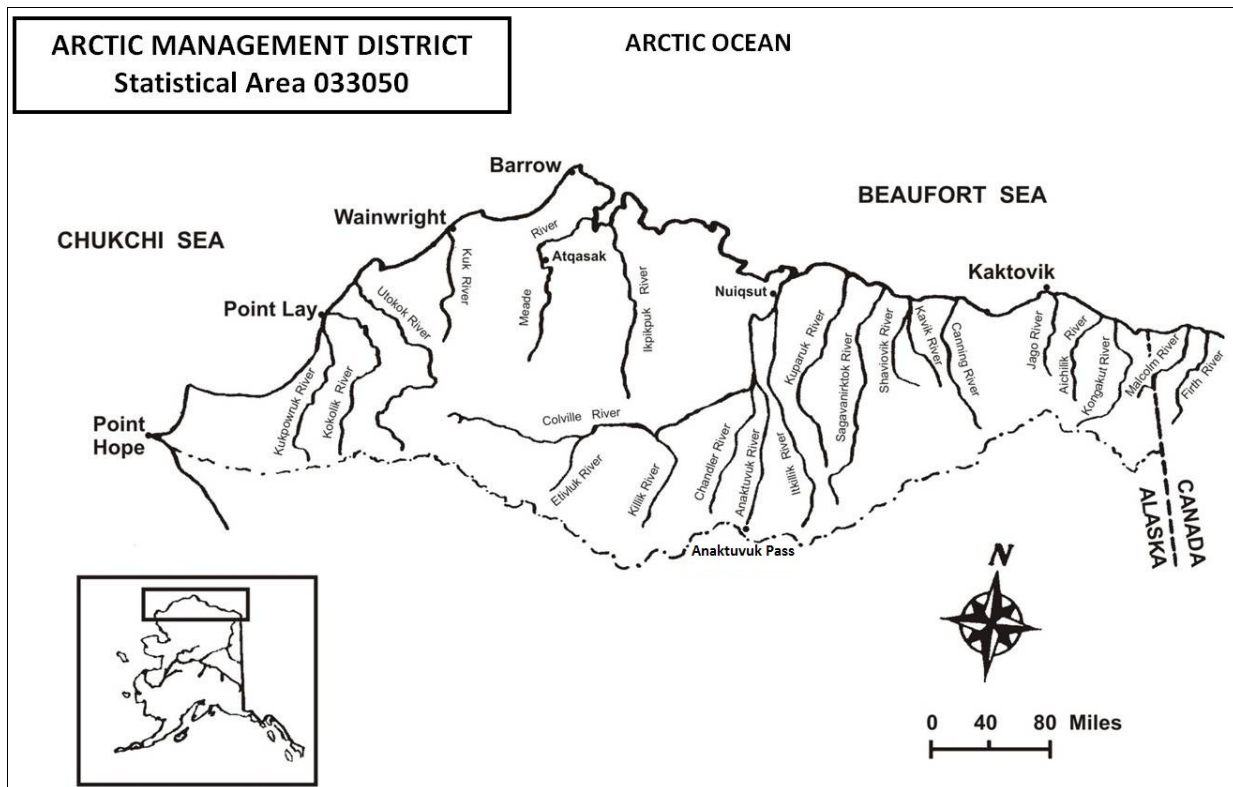


Figure 7.—Arctic management district.

PACIFIC HERRING OVERVIEW

DISTRICT BOUNDARIES

Pacific herring *Clupea pallasii* are present in Norton Sound, Port Clarence, Kotzebue Sound, and Arctic Districts. Norton Sound Herring District consists of all state waters between the latitude of the westernmost tip of Cape Douglas and the latitude of Point Romanof (Figure 8). Port Clarence Herring District consists of all Alaska waters between the latitude of Cape Douglas and the latitude of Cape Prince of Wales. Kotzebue Sound Herring District consists of all Alaska waters between the latitude of Cape Prince of Wales and the latitude of Point Hope. The Arctic District does not have herring district boundaries in regulation.

SPAWNING AREAS AND TIMING

Arrival of herring 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.

The largest abundance of herring in the Arctic-Yukon-Kuskokwim Region is in Norton Sound District. 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. Additional northerly spawning areas have been more difficult to identify because of small herring stock

sizes and limited investigations. Likely spawning areas include Imuruk Basin in Port Clarence District, and Shishmaref Inlet, Deering–Kivalik coast, and Hotham Inlet in Kotzebue District. Although subsistence herring catches have been reported in the Arctic District near Barrow, there is no information available on spawning areas.

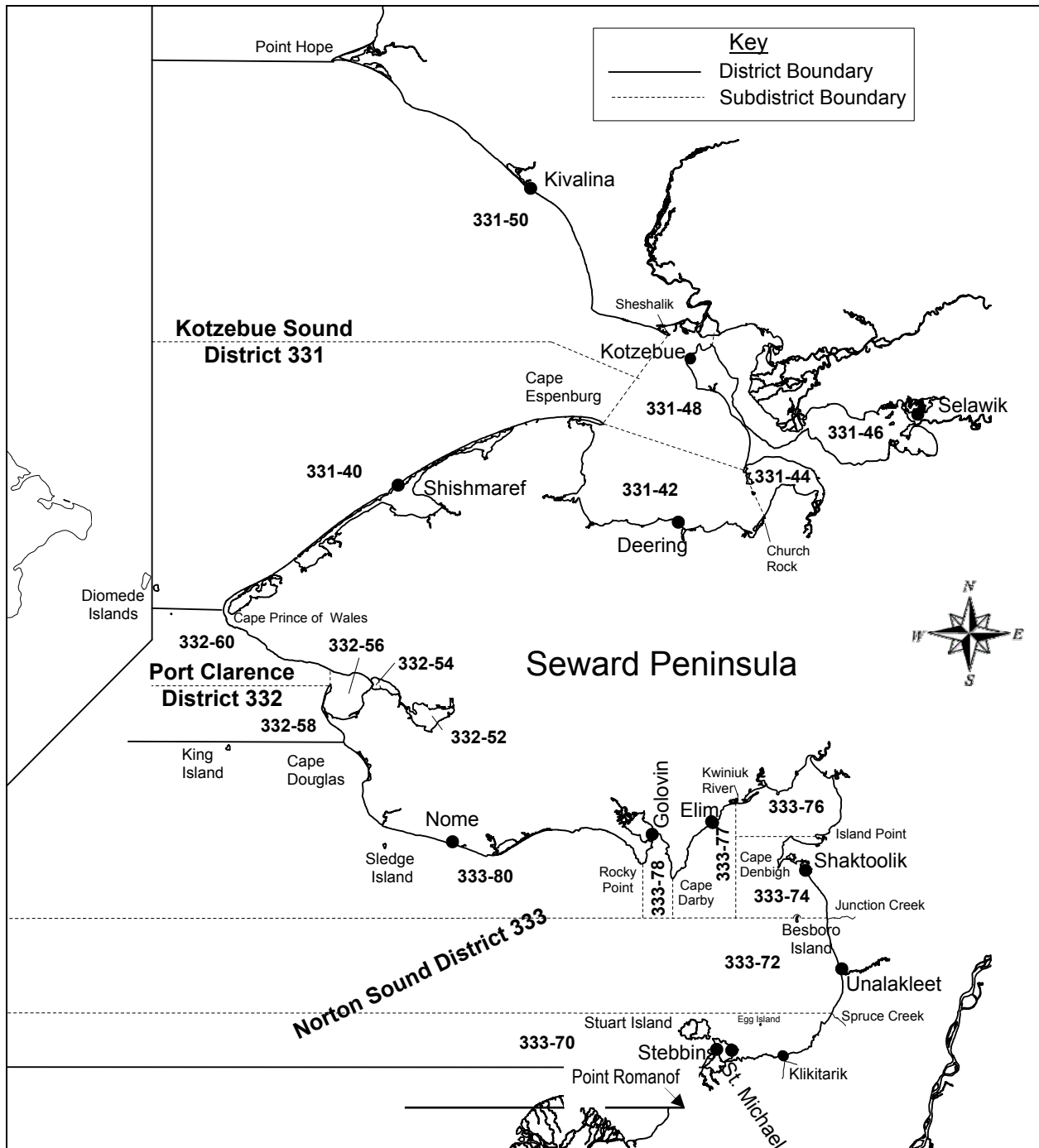


Figure 8.—Commercial herring districts and statistical areas of Norton Sound, Port Clarence, and Kotzebue Sound.

NORTON SOUND PACIFIC HERRING OVERVIEW

COMMERCIAL FISHERY OVERVIEW

Sac Roe

The earliest American commercial effort on Bering Sea herring apparently took place in the early part of the 1900s near Golovin in Norton Sound (Menard et al. 2013). 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 (Menard et al. 2013). 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 fishermen (13 purse seiners, 50 gillnetters). Purse seiners took 70% of the total catch.

After the 1979 season, BOF adopted a public proposal that 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. The regulation attempted to encourage local fishermen to participate in this developing fishery.

During the 1980 season, 294 gillnet fishermen harvested 2,452 tons of herring (Menard et al. 2013). Because gillnet fishermen demonstrated they were capable of taking the available harvest, a regulation was passed in 1981 to prohibit any purse seine gear within Norton Sound District.

Before the 1984 season, harvest by beach seine fishermen was negligible, but in 1984, 10 beach seine fishermen harvested 327 tons. In 1984, BOF set a beach seine gear limit of 100 fathoms and limited harvest to “not exceed 10% of the total herring sac roe harvest projections as published by the ADF&G.” During the fall 1987 BOF meetings, beach seine gear was further restricted to a limit of 75 fathoms. Beach seine harvests from 1985 to 2000 were only about 8% of total reported harvest, and since 1998, little market interest has existed for herring caught with beach seines because of the smaller average size of herring captured.

As with most developing fisheries, fishing effort and harvest increased with each season. In 1984, Norton Sound became a superexclusive herring fishing district to slow growth and bolster local involvement, but it had limited success. The 1987 herring sac roe gillnet harvest was 3,759 tons and had the highest level of fishing effort on record (Menard et al. 2013). This effort was more than twice the average from 1980 through 1986, yet Norton Sound area residents accounted for only about a third of both the effort and total harvest. Then, in 1987 after a public proposal adopted at the fall BOF meeting, the Commercial Fisheries Entry Commission (CFEC) changed Norton Sound Herring District to Limited Entry status with a maximum number of 301 gillnet and 4 beach seine permits. Beginning in 1988, a moratorium was placed on Norton Sound and no new entrants were allowed into the sac roe herring fishery.

No harvest occurred in 1992 due to very late ice breakup, but both the gillnet and beach seine fisheries continued with a total of more than 200 participating fishermen until 1998. The 1995 gillnet harvest of 6,033 tons was the highest on record, and the 1993 beach seine harvest of 742 tons was the largest harvest on record by this gear type. Combined dollar value for both the beach seine and gillnet fisheries peaked in 1996 at \$4.5 million (Appendix D2).

Since 1997, poor market conditions have been the primary influence on the level of commercial harvest. There has been no harvest by beach seine since 2000. Number of fishermen has

decreased from 122 in 1999 to an average of 19 for the past 5 years. From 1999 to present, the number of buyers has steadily declined from 4 to 1, with no buyers present in 2004. Even when there was a buyer, sometimes only bait was purchased, as happened in 2007–2009. One bright spot was the high recovery of over 13% roe in 2010 and 2011. In 2012 there was no sac roe fishery due to late ice breakup.

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 periods ranged from less than 1 ton (1977) to approximately 47 tons (1981). During the 1984 season, 1 ton of *Macrocystis* kelp imported into Norton Sound resulted in a harvest of approximately 3 tons of product (Menard et al. 2013). In response to a public proposal, BOF 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. An experimental herring spawn-on-*Macrocystis*-kelp fishery was approved by BOF to operate in Norton Sound during the 1998 season. The commissioner approved emergency regulations to allow a herring spawn-on-wild-*Fucus*-kelp fishery shortly before the normal start of the sac roe fishery. The intent of these decisions was to allow as much opportunity as possible to sac roe permit holders, because only a small minority would have an opportunity to participate in the sac roe fishery.

At the January 1999 meeting, BOF 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, and the guideline harvest level may not exceed 30 metric tons. The herring pound spawn-on-kelp guideline harvest level may not be more than 90 tons, to include combined weight of herring eggs and kelp.

Since 2001, little (less than 1 ton) or no harvest has occurred from either the *Macrocystis* kelp or wild *Fucus* spawn-on-kelp fisheries (Appendix D2).

Food and Bait Fishery

Early records indicate about 3,200 tons of “fall herring” were processed in Norton Sound from 1916 to 1941 (Menard et al. 2013). This fishery, dependent on salt curing, declined because foreign competition produced poor marketing conditions. Japan began gillnetting in Norton Sound during 1968 with 3 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 (Menard et al. 2013). An average annual harvest of approximately 450 tons was reported in Norton Sound by the Japanese during 1968–1974. All foreign fleets were prohibited in 1977 from gillnet fishing in the area.

Since 1977, there has not been a consistent domestic commercial food and bait herring fishery in Norton Sound. The majority of reported food and bait herring harvest estimates were initially harvested as sac roe but bought and processed as food and bait, so they were considered food and bait for the purposes of this report. The largest Norton Sound herring harvest in the past 50 years occurred in 1995 when an estimated 6,763 tons of sac roe herring were delivered, of which only 116 tons were purchased as food and bait. Since 1997, no more than 91 tons of herring were sold annually as food and bait (Appendix D1).

COMMERCIAL FISHERY MANAGEMENT

The overall statewide management strategy is based upon the *Bering Sea Herring Fishery Management Plan* (5 AAC 27.060) 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 5 years after recruiting into the fishery. Harvesting only a percentage of the biomass ensures 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 (Menard et al. 2013). This strategy prevented harvest efforts from concentrating in one area, on what was then thought to be a distinct stock of fish.

Methods to reliably forecast herring returns are still being developed and estimates of recruitment are not available; therefore, 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. Figured heavily in this strategy is the belief that ripe females approach the beach at that time to spawn. 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. However, since 1997 there have been limited markets for herring and the catch has been well below the guideline harvest level. Since 2002, to maximize efficiency for fishermen and buyers, ADF&G has opened the fishery continuously once buyers are ready and then buyers direct the fleet when to set and pull nets.

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 provided less optimal fishing times. Beach seiners are able to harvest their allotment of 10% of the preseason harvest goal in a single 3-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. In the past, management staff 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.

In the 2000s, the market desired a higher roe percent and larger size fish. These criteria have been difficult to achieve with beach seine gear and therefore no buyer interest has existed for herring harvested from beach seines.

SUBSISTENCE FISHERY USE

Pacific herring were used for subsistence purposes by coastal residents well before the mid-1800s when their use was first documented by early explorers. Subsistence harvest of herring and herring roe on kelp is not documented but is believed to be relatively small. It is also known that St. Michael and Stebbins residents harvest spawn-on-kelp roe for subsistence use.

PORT CLARENCE AND KOTZEBUE PACIFIC HERRING OVERVIEW

COMMERCIAL FISHERY OVERVIEW

Port Clarence and Kotzebue commercial herring fisheries have been in regulation since 1982. In Port Clarence and Kotzebue Districts, regulations state that herring may be taken from April 15 through November 15, except that herring may not be taken during the open commercial salmon fishing season. The 1983 and 1984 regulations set a guideline harvest of 150 metric tons (165 tons) for each subdistrict, which is still in effect. Presently, purse seines, beach seines, and gillnets are legal commercial gear within these districts.

Before 1987, no spring sac roe commercial fisheries had ever occurred within these districts. In 1987 and 1988 a spring sac roe herring fishery was attempted in the Port Clarence District. A fish buyer located in Nome in 1994 and 1995 provided a ready crab bait market and transportation for fish, which facilitated a spring harvest. However, no one has fished for bait since 1996 (Appendix D4).

Regulations allow spawn-on-kelp fisheries in Port Clarence and Kotzebue. Attempts at open pound *Macrocystis* harvest in Port Clarence District in 1991 and 1992 were unsuccessful.

HISTORICAL RESOURCE INVESTIGATIONS

Resource investigations of Port Clarence and Kotzebue Sound area herring stocks were conducted by ADF&G from March 1976 to 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. |
| <i>Zostera sp.</i> primary spawning substrate. | <i>Fucus sp.</i> primary spawning substrate. |
| More euryhaline. | Less euryhaline. |
| Over winter in shallow bays; water is warmed by river discharge under ice cover. | Over winter 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 Districts. These data do not preclude possibility of more southern stocks utilizing this region, such as stocks that 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 that 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 species composition of any biomass sighted. A further complicating factor within Port Clarence is spring ice conditions. Port Clarence is a sheltered body of water that 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 Port Clarence, where herring mass just before the ice moves. In each of the past several years one or two surveys were flown, but virtually no herring were observed because the narrow window of time for seeing fish was missed.

KING CRAB OVERVIEW

NORTON SOUND KING CRAB OVERVIEW

District Boundaries

Norton Sound Section (Q3) consists of all waters in Registration Area Q north of the latitude of Cape Romanzof (61 degrees 49 minutes N latitude), east of the International Dateline, and south of 66 degrees N latitude (Figure 9).

Abundance

Since 1998, a length-based population model has been used to predict biomass for the red king crab population in Norton Sound (Zheng et al. 1998). Incorporating data from trawl surveys (Appendices E2 and E13–E14), historical winter and summer pot studies, and winter and summer fisheries (Appendices E15–E20), the model is used to project abundance estimates of legal male crab even in years when no trawl survey occurs, allowing abundance-based management of the summer commercial crab fishery. Every time new data are incorporated into the population model, the model both estimates current abundance and revises prior years' abundances. It should be noted that estimates prior to 1996 are currently under review because survey extrapolation methodologies changed after that point, and previous biomass estimates may be revised and incorporated into the model as a result of this assessment.

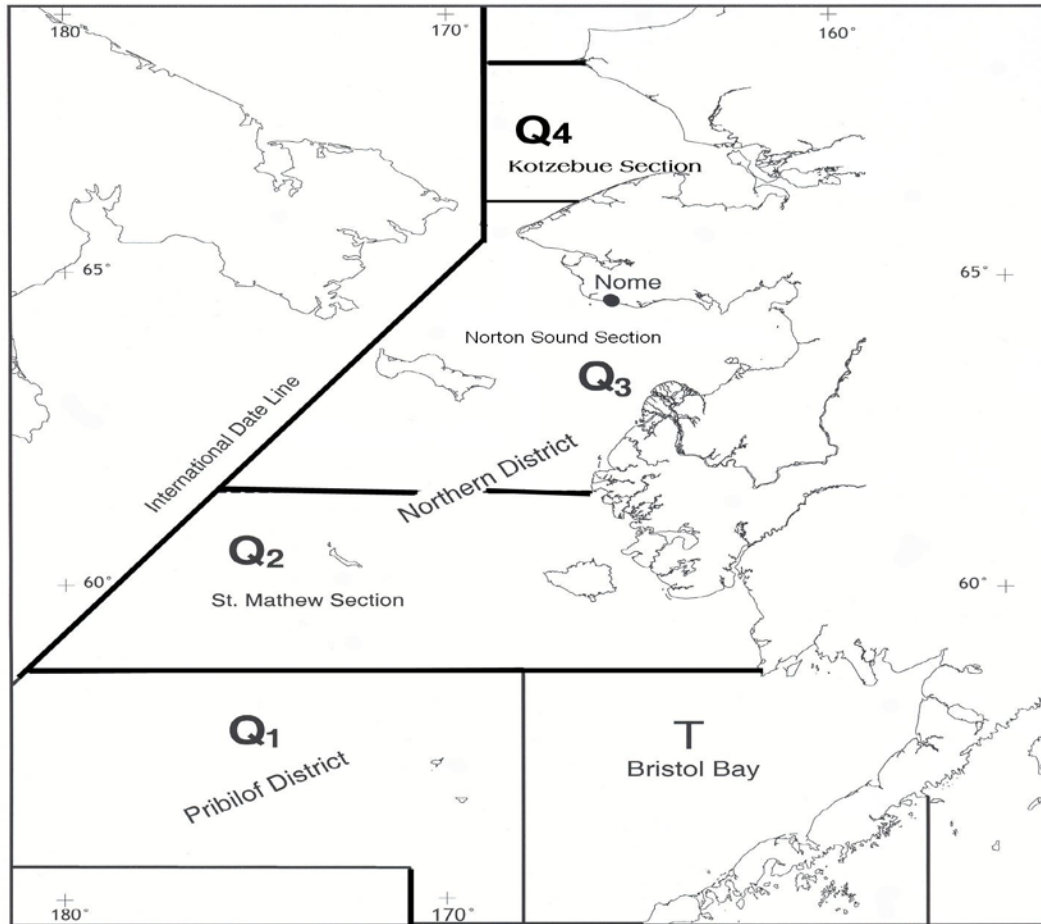


Figure 9.–King crab fishing districts and sections of Statistical Area Q.

The following estimates are based on the model's results from spring of 2013 with the latest data from the 2011 trawl survey, the 2012 summer fishery, and the 2011–2012 winter study. In 2008, legal biomass estimate for the summer crab fishery was 3.35 million lb, an increase of 13% from the 2.96 million lb estimated for 2007. The legal population estimate increased for the following 3 years: to 3.71 million lb in 2009, 4.24 million lb in 2010, and 4.43 million lb in 2011. From 2011 to 2013, the legal abundance estimate decreased, to 4.22 million lb in 2012 and to 4.13 million lb in 2013 (NPFMC 2013).

The latest winter study data indicate that the legal proportion of the catch increased from 2007 to 2010, changed little from 2010 to 2011, and decreased in 2012 (Appendix E8). However, the record high overall male catch per unit of effort (CPUE) seen in 2012 and relatively stable legal CPUE from 2008 to 2011 suggests that the decline in 2012 in proportion of legal crab was caused more by an increase in prerecruit abundance than a decline in legal crab abundance. Because prerecruit-1 crab require 1 molt to become part of legal population the following year but prerecruit-2 crab require 2 molts, the above-average proportion of prerecruit-2 male crab in 2012 indicates a possible recruitment surge in 2014. No winter study took place in 2013 because ADF&G did an expanded spring and summer tagging study.

COMMERCIAL FISHERY OVERVIEW

The last year that a large-vessel summer commercial crab fishery existed in Norton Sound Section was in 1990. No summer commercial fishery occurred in 1991 because of ADF&G staff constraints. In 1992, the summer commercial fishery resumed. Appendix E1 shows historical summer commercial harvest by year and statistical area for Norton Sound crab fishery since 1990. For historical information before 1990, please refer to the 2012 Annual Management Report (Menard et al. 2013). Regulation changes adopted during the March 1993 BOF meeting changed participation in the fishery to that of small boats. A superexclusive designation went into effect for the Norton Sound commercial crab fishery June 27, 1994. This designation stated that a vessel registered for the Norton Sound crab fishery may not be used to take king crab in any other registration area during that registration year. Later, a vessel moratorium put into place before the 1996 season was intended to precede a license limitation program. Community Development Quota (CDQ) groups were allocated a portion of the summer harvest beginning in 1998, but no CDQ 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 LLP by National Marine Fisheries Service. Regulation changes and location of buyers resulted in harvest distribution moving eastward in Norton Sound in the mid-1990s (Appendix E12).

During the March 1999 BOF meeting 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 lb. A summer commercial season may only open if the legal crab biomass is estimated to be at least 1.5 million lb, and if the legal biomass falls in the range of 1.5 to 2.5 million lb the harvest rate will be no more than 5% so the stock may rebuild. If legal biomass is 2.5 million lb or more, the harvest rate will be no more than 10%. In March of 2012, this regulation was modified by the BOF so that the new threshold level of abundance of legal male red king crab biomass was set at 1.25 million lb. If the estimated legal crab biomass falls within the range of 1.25 to 2.0 million lb, the harvest rate will be no more than 7% of legal male abundance. From 2.0 to 3.0 million lb, the harvest rate will be no more than 13%. If the estimated legal biomass is more than 3.0 million lb, the harvest rate will be no more than 15%. Improved abundance estimates and the current management strategy will greatly reduce the risks of overfishing the stock.

Since 1981, in order to protect crab utilized by the inshore subsistence fishery from commercial harvest, an area delineated by a line approximately 10 to 15 miles off the shores of southern Seward Peninsula from Port Clarence to St. Michael has been closed to the summer commercial fishery. This closure line has relaxed over the years to its current position adopted by the BOF in 2002 (Appendix E11).

To reduce handling mortality of undersized crab and smaller female crab, the BOF at its March 2008 meeting put a new regulation into effect: a minimum of 4 escapement rings are required per pot with each ring having a minimum inside diameter of 4.5 in located within 1 mesh size from the bottom of the pot, or at least one-half of the vertical surface of a square pot or sloping side-wall surface of a conical or pyramid pot must be composed of no less than 6.5 in stretched mesh. Also starting with the 2008 season, even though the minimum legal size of red king crab is 4.75 inches in carapace width (CW), the local seafood plant did not always buy crab less than 5.0 in CW. The Anchorage buyer, however, has continued to buy crab as long as they are of legal size.

In 2010, due to concern over lack of stock status information, the North Pacific Fisheries Management Council closed the area above Cape Prince of Wales to crabbing. Only state waters (within 3 miles of shore) will be open to crabbing north of the latitude of Cape Prince of Wales (Appendix E11).

CDQ Fishery

NSEDC and Yukon Delta Fisheries Development Association (YDFDA) divide the CDQ allocation. Only fishermen designated by these 2 CDQ groups are allowed to participate in this portion of the king crab fishery. Fishermen were required to have a CDQ fishing permit from CFEC and register their vessel with ADF&G before they made their first delivery. Fishermen operated under authority of the CDQ group and each CDQ group decided how their crab quota was harvested.

During the March 2002 BOF meeting, new regulations were adopted that affected the CDQ crab fishery and relaxed closed-water boundaries in eastern Norton Sound and waters west of Sledge Island. Closed-water boundaries are illustrated in Appendix E11. The Norton Sound CDQ fishery may begin at noon on June 15, or no less than 72 hours after commercial gillnet or beach seine herring fishing is closed, whichever is later, through noon on 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. At the March 2008 BOF meeting the regulation requiring the herring fishery to be closed was repealed, and the CDQ fishery was allowed to occur by emergency order before, during, or after the open access fishery. Previously, the open access fishery started on July 1, but BOF passed a regulation allowing ADF&G to open the fishery by emergency order anytime beginning on or after June 15.

Commercial Catch Sampling

The Norton Sound red king crab commercial 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 those years. In years with no onboard observer, a smaller percentage of crab from the commercial harvest is sampled because fishermen deliver at all times of the day and night. The new seafood processing plant, Norton Sound Seafood Products (NSSP), began operating in Nome in summer 2002, greatly improving the ability of Nome ADF&G staff to sample crab brought to the Nome dock. Crab was either sampled at NSSP or at the small boat harbor where nonresident fishermen or catcher-processors not selling to NSSP offload their catch for delivery to Anchorage. ADF&G will continue to make a concerted effort to coordinate catch sampling with fishermen and buyers to ensure optimal commercial harvest data collection.

SUBSISTENCE FISHERY OVERVIEW

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, BOF enacted a regulation in 1977 requiring subsistence fishermen in Norton Sound to obtain a permit before fishing. Fishermen record their daily effort and catch on these permits.

For catch information before 1990, please refer to the 2012 Annual Management Report (Menard et al. 2013). Since 1990, the winter subsistence crab fishery harvest has ranged from a low of 256 crab during the 2000–2001 season to a high of 12,152 crab during the 1989–1990 season (Appendix E5). Lack of success in the winter crab fishery during some 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, as well as increased use of more efficient gear (pots instead of hand lines). Unstable ice conditions and record snowfalls adversely affected: 1992–1993, 1996–1997, 2000–2001, 2003–2004, and 2005–2006 catches. During years of stable ice conditions, approximately 85 fishermen averaged 80 crabs each.

ST. LAWRENCE ISLAND AND KOTZEBUE KING CRAB OVERVIEW

District Boundaries

Formerly, St. Lawrence Island Section was located immediately west and north of Norton Sound Section, but in May of 2006, BOF expanded Norton Sound Section to include the St. Lawrence Island Section south of 66 degrees N latitude and west of 168 degrees W longitude (Figure 9). The former St. Lawrence Island Section north of 66 degrees N latitude is now the Kotzebue Section.

Abundance

Unlike Norton Sound, the area of the Bering Strait that includes St. Lawrence Island has never been surveyed consistently by ADF&G. Even though commercial and subsistence harvests are allowed by regulation, ADF&G does not have abundance estimates for this area. In summer of 2005, an exploratory pot survey was conducted by NSEDC in cooperation with ADF&G to assess the number and distribution of male blue king crab in the vicinity of King Island, Wales, and Port Clarence. The survey was only partially successful due to strong currents that made pot retrieval difficult when set deeper than 10 fathoms. Shallow pot placement resulted in a catch primarily of egg-bearing female blue king crab, and indicated that using standard Norton Sound crab gear would only access a nursery site for gravid blue king crab. When more suitable gear becomes available, further surveys will be necessary to determine the feasibility of a summer fishery. At the March 2008 BOF meeting, legal size requirement for blue king crab was changed from 5.5 to 5.0 in. Preliminary data indicate that blue king crab size at maturity is very similar to Norton Sound red king crab.

In summer of 2006, 2008, and 2011, the Northern Bering Sea trawl survey was conducted by NSEDC in cooperation with ADF&G to assess crab resources in the St Lawrence Island and Bering Strait areas of Norton Sound District. The primary focus was to collect information on blue king crab size, distribution, and abundance. The area surveyed lies west and northwest of the standard ADF&G triennial Norton Sound red king crab trawl survey locations. In 2006, trawls were conducted from near the southwest corner of St Lawrence Island to the Bering Strait area southwest of Cape Prince of Wales. Size information and general distribution of blue king crab was collected. In 2008 prior to the trawl survey, a camera sled was towed a few meters above the seabed to observe crab and other species in the St. Lawrence Island area that had been trawled in 2006. The 2008 and 2011 trawl work was focused on looking at the distribution of blue and red king crab in the area between Port Clarence and King Island. More survey work is necessary to generate an abundance estimate and to better understand the distribution of blue king crab. The 2006, 2008, and 2011 survey data should only be considered a starting point to understanding the Bering Strait and St. Lawrence Island blue king crab stock.

Commercial Fishery Overview

In 1984, a regulation was adopted to close waters within 10 miles of all inhabited islands within the St. Lawrence Island Section (St. Lawrence Island, Little Diomed, and King Island). This regulation attempts to protect stocks targeted by local fishermen and reduce impacts on marine mammal subsistence harvests. Since 1990, commercial catches in the former St. Lawrence Island Section have only been reported for 4 years. In 1992, 53 lb of blue king crab were landed. In 1995, 7,913 lb of blue king crab were delivered from 3 landings (Bue et al. 1997). In 2005, 316 lb of red king crab were harvested in the Kotzebue area, and in 2006, 340 lb were harvested¹.

Villagers of Little Diomed and St. Lawrence Island have bartered with and sold winter-caught blue king crab to residents of Nome and other villages for years. ADF&G 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.

MISCELLANEOUS FISH OVERVIEW

Several species other than salmon, crab, and herring are utilized for commercial and subsistence purposes in Norton Sound, Port Clarence, Kotzebue, and Arctic Districts (Appendix G1). Primary species include inconnu or “sheefish” *Stenodus leucichthys*, Dolly Varden *Salvelinus malma*, whitefish (*Coregonus laurettae*, *C. pidschian*, *C. sardinella*, *C. nasus*, and *Prosopium cylindraceum*), *Coregonus* sp., *Prosopium* sp., 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)

Spawning Areas and Timing

Sheefish are distributed throughout nearshore estuarine areas of Kotzebue Sound, with the largest spawning stocks and harvests in the Kobuk–Selawik River drainages and Hotham Inlet. However, there is a small population in the Sheshalik and Krusenstern areas of northern Kotzebue Sound and in the Koyuk River of Norton Bay in Norton Sound (Figure 10).

¹ Statewide electronic fish ticket database. 1st edition. Alaska Department of Fish and Game, Division of Commercial Fisheries. 1985 to present. [URL is not publically available because some information is confidential.] Hereafter referenced as “fish ticket database.”

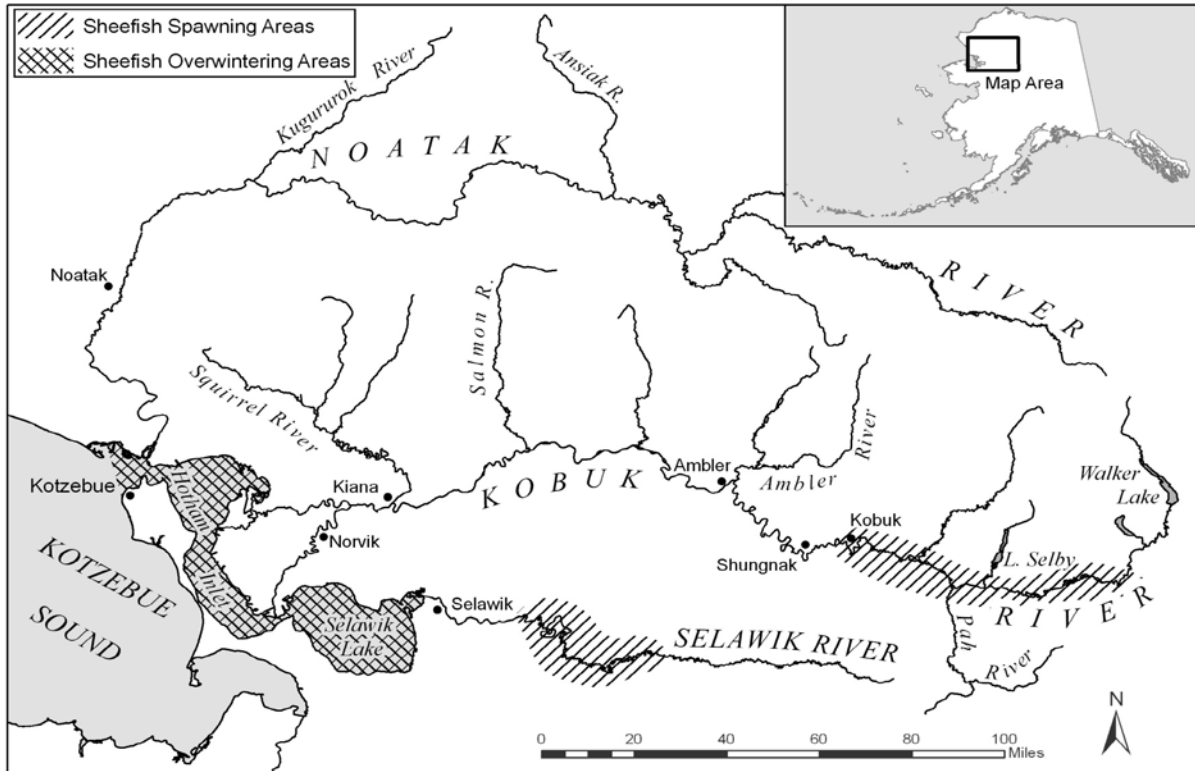


Figure 10.—Kotzebue and Kobuk River Valley villages and their spatial relationship with inconnu spawning and overwintering areas.

Inconnu’s spawning and overwintering migration behavior makes them available for harvest by various fisheries throughout their life cycle, yet increases their vulnerability to overharvest. Although inconnu are capable of consecutive spawning, most spawn every 2 to 3 years, and slow maturation rates of 5–7 years for males and 7–11 for females increase the time required to restore depleted populations. Sheefish have high fecundity, and large females can carry over 400,000 eggs. Such populations may be subject to episodic recruitment events depending on environmental conditions. If spawner abundance is maintained above a threshold level, intermittent years of good recruitment can carry the population through years of less favorable ice conditions.

After ice breakup in Kotzebue Sound area, adult sheefish migrate upriver to spawning areas on the Kobuk and Selawik rivers. On the Kobuk River, spawning occurs upstream from the village of Kobuk, with the greatest concentration observed between the Mauneluk and Beaver rivers. Then, when spawning is complete in late September and early October, sheefish disperse downstream to overwintering areas within Hotham Inlet/Selawik Lake.

Historical Fishery Use

During the 1960s, age, sex, and length data indicated inconnu stocks were overharvested by commercial and subsistence fisheries in Kotzebue District. Consequently, an annual area commercial harvest quota of 25,000 lb was instituted, but subsistence is given priority and has remained unrestricted.

Subsistence Fishery

Inconnu have long been utilized for subsistence purposes throughout Kotzebue basin, especially in Kotzebue, Selawik, and the villages along the Kobuk River. In 2004, an estimated 10,163 sheefish were harvested, surpassing the previous record since 1971 estimated at 9,805 in 1997, and 7,823 in 2003 (Appendix F2). These harvests may include winter, summer, and fall catches. Due to budget constraints, the Division of Subsistence did not survey the villages in Kotzebue Sound District for subsistence sheefish harvests from 1988 to 1990, and from 2004 to 2011. Due to limited survey effort during many years, total catch and effort should be regarded as minimum numbers and are not comparable year to year. Subsistence inconnu harvest information was not always collected for the town of Kotzebue, where a sizable ice fishery occurs for sheefish in late winter and spring. In 2012 and 2013, there were comprehensive subsistence surveys for fish and wildlife harvests of 6 Kotzebue area villages, but data is not yet available for 2013.

Summer and fall subsistence fishing for inconnu occur 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 fishermen use gillnets set under the ice in Hotham Inlet and Selawik Lake. No requirement exists for harvest reporting; however, during various years from 1973 to 2004 and starting again in 2012, ADF&G Division of Subsistence conducted household subsistence harvest surveys in various villages in Kotzebue District.

In 1987, BOF adopted a regulation limiting size of gillnets used to take inconnu for subsistence to be not more than 50 fathoms in aggregate length or 12 meshes in depth, nor have a mesh size larger than 7.0 in (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.

Commercial Fishery

Most commercial fishing effort occurs through the ice in Hatham Inlet, near Kotzebue, using gillnets from 5.5 in to 7.0 in stretched mesh. Recorded commercial catches are relatively small, but undocumented catches may be significant. Therefore, harvest totals should be considered minimum estimates. Restricted markets outside northwestern Alaska greatly limit commercial activity; however, most individuals participating in the winter commercial fishery also fish for subsistence purposes. Inconnu incidentally caught in the commercial salmon fisheries are sold in years when there is a market, but only in small amounts. Reported harvest and effort in the commercial fishery have declined in the last 15 years. Since 1998, harvest has not exceeded 1,250 lb, compared to the highest harvest of 8,224 lb in the last 23 years (Appendix F1). There were no reported commercial sheefish catches from 2006–2011 and 2013, but fishermen participated in commercial fishing in 2005 and 2012. Although sheefish were probably harvested and sold in the winter of 2011–2012 by several fishermen, only 1 fish ticket from the Kotzebue Sound District was submitted to ADF&G, making that catch information confidential.

Sport Fishery

Kotzebue District sheefish are considered by many to be among the pinnacle of Alaska freshwater sport fishing due to their large size. Since the start of the ADF&G Trophy Fish

Program in 1967, all but one qualifying sheefish came from the Kobuk River. In spite of this, the level of sport fishing effort is still quite low.

Residents of Kobuk River villages have expressed concern over sport fish practices near spawning grounds on the upper Kobuk River. Catch-and-release fishing is considered by some local residents to be disrespectful and damaging to sheefish. Also, the practice of discarding filleted carcasses in the water is thought to drive other sheefish away from the area. In 1986, the Division of Subsistence investigated these concerns and found the concerns could be addressed if sport anglers were more aware of local customs and culture. An educational brochure is now available to fishermen on upper Kobuk River in the hope that proper handling during catch-and-release can minimize impacts on spawning populations. Although overall harvests are substantial, populations appear to be healthy, spawner abundances are increasing, and sport harvests are relatively low (Scanlon 2009). Sheefish sport harvests in the last 10 years have averaged approximately 850 annually (Appendix F3).

Historical 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. During these surveys, species identification has been a problem. Surveys were not conducted from 1984 through 1990 because of high and/or 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, but 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 Division of Sport Fish, U.S. Fish & Wildlife Service (USFWS), and National Park Service. 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; the 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 and 5,300 for 1995 and 1996, respectively. Tag recoveries showed that these stocks mixed in Hotham Inlet winter habitats but maintained fidelity to their spawning areas (DeCicco 2001).

DOLLY VARDEN

Dolly Varden are distributed throughout Norton Sound, Port Clarence, Kotzebue, and Arctic Districts. Although taxonomists have disagreed on 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.

Spawning Areas and Timing

Dolly Varden in northwest Alaska are primarily nonconsecutive spawners. They spawn throughout late summer and fall in almost all drainages of Norton Sound, some northern Seward Peninsula rivers, and the major drainages of Kotzebue Sound and Chukchi Sea. Fry emerge in spring and migrate to the ocean during early summer after spending from 1 to 6 (generally 2–5) years in freshwater. Movements of Norton Sound Dolly Varden coincide with salmon. In spring, Dolly Varden are likely to remain longer in streams following a large pink salmon run to feed on abundant outmigrating fry. Also, they are sometimes present in streams during summer to feed on salmon eggs, especially during years of high pink salmon abundance.

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 overharvest and provide for reproductive needs and subsistence uses.

Subsistence Fishery

Dolly Varden is an important component in the diet of subsistence users in Norton Sound–Kotzebue Sound and Arctic areas. In some communities, they outrank salmon and whitefish in importance to subsistence; however, most villagers in Norton Sound District report Dolly Varden as incidental catches in subsistence salmon nets. Subsistence fishermen harvest Dolly Varden with 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 annual subsistence Dolly Varden harvest.

In Kotzebue District, fall seine fishing is a group effort with several households making up 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. Most Dolly Varden harvests take place before or just after freeze-up. Fishermen from Noatak usually fish before freeze-up, but residents of Kobuk River villages of Shungnak and Noorvik fish for Dolly Varden throughout the winter. Since 1991, subsistence catch of Dolly Varden in Noatak has ranged from almost 3,000 to over 11,000 fish (Appendix F5), but they should be considered minimal figures because of survey timing. Except for 2007, no Dolly Varden harvest surveys have been conducted of Kivalina residents during the last 22 years. In 2012 and 2013, a comprehensive survey of fish harvests was done in Kobuk River villages and Noatak by the Division of Subsistence, but data are not yet available for 2013.

In Arctic District, fishery harvest studies by ADF&G's Division of Subsistence noted that annual community catches of Dolly Varden in Kaktovik (Pedersen and Linn 2005) and Anaktuvuk Pass (Pedersen and Hugo 2005) produced annual catches of “char” (a mix of Arctic char and Dolly Varden).

Commercial Fishery

Dolly Varden generally appear in commercial catches during the last 3 weeks of August and are taken as a nontarget species in the Kotzebue Sound commercial chum salmon fishery. In 1976, regulations closed the commercial chum salmon fishery on August 31 and thus reduced harvest of Dolly Varden. Spawning and overwintering Dolly Varden typically pass through the area during September but typically begin migration along the northern shore of Kotzebue Sound during the third week of August. Reported Dolly Varden sales are dependent upon available markets. The typical season catch, when buyers are purchasing Dolly Varden throughout August,

is approximately 1,000 to 3,000 fish (Appendix F4). However, limited markets in the 2000s have resulted in less than 200 Dolly Varden reported sold each year in Kotzebue Sound, and zero sold since 2005 because the buyer no longer purchases Dolly Varden. Regardless of sales, Dolly Varden catches are still required to be reported on fish tickets. During the 2011–2012 season, three fishermen caught and sold 1,057 lb of Dolly Varden to the fish plant in Nome as bait. This was the first recorded sale of Dolly Varden in Norton Sound in recent history.

Sport Fishery

Drainages of Kotzebue Sound and the Chukchi Sea are known for the large size of anadromous Dolly Varden, but Kotzebue area residents and non-locals boating on Kobuk and Noatak rivers are the primary participants in this area's Dolly Varden sport fishery. Both Noatak and Kobuk rivers are National Wild and Scenic rivers with headwaters included in Gates of the Arctic National Park. However, the Wulik River is probably the most important Dolly Varden stream in northwestern Alaska. The 90-mile Wulik River is known for the largest and most abundant Dolly Varden populations. Located approximately 90 miles north of Kotzebue, Wulik River flows into the Chukchi Sea through Kivalina Lagoon near the village of Kivalina and is estimated to have over 100,000 overwintering Dolly Varden annually.

Since the start of the ADF&G Trophy Fish Program in 1967, 140 of 219 qualifying Dolly Varden have come from Kotzebue Sound and Chukchi Sea drainages. Additionally, the current Alaska sport fish angling record for Dolly Varden was 12.4 kg (27 lb 4 oz), taken from the Wulik River in 2002 and surpassing the previous record (also taken from the Wulik River in 2000). In spite of this, sport fishing effort has been consistently low, which is probably due to the remote location and difficult access of fishing sites (Scanlon 2009). Dolly Varden sport fish harvests in the last 10 years in Norton Sound averaged almost 3,200 annually but averaged less than 1,200 in the Kotzebue/Chukchi Sea areas (Appendix F3).

Historical Escapement

Since 1990, aerial survey counts of overwintering Dolly Varden on the Wulik River has ranged from 135,135 fish in 1992 to 1,500 fish in 2003 (Appendix F7). Weather and water conditions have precluded flying aerial surveys during many years. Weather permitting, Division of Sport Fish conducts aerial surveys of Noatak River spawning grounds in summer, and Kivalina and Wulik rivers overwintering areas in fall. Since 2000, however, only Wulik River has been surveyed.

WHITEFISH

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, 3 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 the sole representatives of genus *Prosopium* in this area.

Spawning Areas and Timing

Whitefish occur throughout most bodies of fresh water in Norton Sound, Port Clarence, Kotzebue, and Arctic districts and can also be found at various times of year in inshore marine

waters. Several whitefish species spawn in freshwater in late August to October when lakes and streams are close to freezing.

Commercial Fishery

Limited commercial whitefish harvests have been allowed since statehood, normally under auspices of a permit that delineates 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. During the 2006–2007 season, one local Nome fisherman, who waived confidentiality, sold 3,723 lb of whitefish. No further whitefish harvests occurred until the 2010–2011 season, and since then only one or two fishermen have harvested whitefish commercially for no more than 2,200 lb total (Appendix F9).

In the Arctic District, a commercial fishery for freshwater finfish has existed in the Colville River delta (located approximately 60 miles west of Prudhoe Bay) since 1964 (Menard et al. 2013). Historically, commercial fishing generally took place during late June and July for broad and humpback whitefish and October through early December for Arctic and least cisco. However, since 1990 commercial fishing effort has predominantly occurred in October and November for Arctic and least cisco. Set gillnets are used as capture gear, and fishing during fall months occurs under the ice. All fish were harvested with the intent to sell commercially and are reported daily on a catch form. However, not all fish reported on permits for this area were sold. Those fish not commercially sold were retained and used for subsistence purposes. No commercial harvest has been reported since 2007 from the Coville River (Appendix H1).

Subsistence Fishery

Whitefish are important for subsistence use and 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 because fishermen do not count fish individually, but by “tubs,” “bags,” “strings,” or 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 (Appendix F8).

The relative importance of whitefish is higher in Kotzebue Sound District than in many areas of the state (Georgette and Shiedt 2005). Average subsistence harvests of whitefish estimated for the village of Noatak and the 5 Kobuk River villages combined from 1997 to 2004 was almost 54,000 fish (Appendix F8). Harvest numbers are considered minimal and are not comparable year to year. Since 2004, subsistence harvest surveys have not been conducted in the Kotzebue Sound District until 2012, when the Division of Subsistence conducted a comprehensive subsistence fish harvest survey in the Kobuk River villages and Noatak.

Historical Escapement

Whitefish escapements have not been monitored in the past, but limited ADF&G observations and fishermen 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 Arctic-Kotzebue areas. Tomcod are taken through the ice by jigging, and with gillnets in open water and under the ice.

No extensive commercial fishery on tomcod in Norton Sound-Port Clarence and Arctic-Kotzebue areas has ever occurred, but during the 1980s, a limited commercial fishery occurred in Norton Sound (Menard et al. 2013). According to local fishermen, these fish were used for dog food, crab bait, and human consumption. In the mid-1990s, NSEDC established markets for several fish species not commercially utilized in the past. The need for crab bait was the primary factor in initiating the saffron cod fishery near Unalakleet. A total of 1,402 lb of saffron cod were sold during the 1993-1994 season. The NSEDC market was not available the following winter and was probably a factor in the reduced harvest of 52 lb (Appendix F10).

No commercial harvest was reported from 1995 through 2008. Since the fall of 2009, total annual tomcod harvest has ranged from 1,748 lb to almost 34,000 lb (Appendix F10), all sold to Norton Sound Seafood Products (NSSP) in Nome for use as crab bait. NSSP would only buy tomcod that were caught through the ice by jigging gear.

Miscellaneous Finfish Species

Other finfish species taken for subsistence in Norton Sound, Port Clarence, Kotzebue, and Arctic areas include capelin, rainbow smelt (boreal smelt), northern pike, starry flounder, yellow fin sole, Arctic flounder, Alaska plaice, Arctic grayling, burbot, blackfish and halibut (Appendix G1).

Subsistence Fishery

Subsistence utilization of these species has been documented, although effort and catch vary widely in scale and importance with locality. Some species are important to the subsistence community in certain localities during specific seasons of the year. In Nome Subdistrict, both Nome and Solomon rivers were closed to subsistence fishing for Arctic grayling in 2001 when abundance was determined to be low.

Commercial Fishery

Burbot, or freshwater cod, have been commercially sold sporadically in the past in Kotzebue, Port Clarence, and Norton Sound districts under commercial permits.

Sport Fishery

Sport fisheries for Arctic grayling exist in Norton Sound-Port Clarence and Arctic-Kotzebue areas, but they are relatively small. Average annual sport fish harvests for Arctic grayling in the last 5 years were under 1,000 fish in both Norton Sound and Kotzebue Districts. In Norton Sound, average Arctic grayling sport fish harvests for the last 10 years are roughly a fourth of that of Dolly Varden, but in Kotzebue District, average Arctic grayling sport fish harvests for the last 10 years is over half that of Dolly Varden (Appendix F3).

SECTION 2: SALMON FISHERIES

2013 NORTON SOUND SALMON FISHERY

2013 Norton Sound Fisheries Outlook

The 2013 outlook was for a commercial harvest level of 40,000 to 70,000 chum salmon, 50,000 to 100,000 pink salmon, and 30,000 to 60,000 coho salmon. Salmon outlooks and harvest projections for the 2013 season were based on qualitative assessments of parent-year escapements and age composition, subjective determinations of freshwater overwintering and ocean survival conditions, and, in the case of the commercial fishery, anticipated market interest and processing capacity.

For the first time in over 20 years, commercial fishing for chum salmon was expected to occur in Nome Subdistrict. Commercial periods for chum salmon were not expected to exceed 24 hours in length.

As in previous years, the bulk of commercial salmon harvests were expected to come from southern Norton Sound (Subdistricts 4–6). The relatively large southern Norton Sound watersheds (e.g., Inglutalik, Ungalik, Shaktoolik, and Unalakleet rivers) generally support larger runs of salmon. This fact, coupled with stable, healthy salmon runs (except Chinook salmon) and more liberal fisheries management plans, allows for more commercial harvest opportunity in the southern Norton Sound subdistricts. In contrast, salmon runs, particularly chum salmon runs, have been more unstable in the smaller drainages to the north in Subdistricts 2 (Golovin) and 3 (Elim) since the early 2000s. Subdistricts 2 and 3 chum salmon runs have either been very strong, providing large surpluses available for commercial use (e.g., 2006, 2007, 2010, 2011); or very weak, with runs often below levels needed to achieve escapement goals, such as in 2004, 2005, 2008, and 2009. The extent and frequency of commercial chum and pink salmon periods in Subdistricts 2 and 3 is also largely predicated on the Subdistricts 2 and 3 management plan, which directs ADF&G to ensure that chum salmon escapement goals and subsistence needs are achieved.

Commercial Fishery Season Summary

Weak Chinook salmon runs occurred throughout Norton Sound in 2013, requiring inseason restrictions and early closures to southern Norton Sound subsistence fisheries. As expected in odd-numbered years, pink salmon runs were only sufficient to provide for subsistence needs and limited directed commercial fishing openings. However, substantial increases in commercial chum and coho salmon harvests occurred in 2013, and sockeye salmon abundance was sufficient to reach escapement goals and avoid an early closure to the Pilgrim River sockeye salmon fishery for the first time since 2008.

The 2013 Norton Sound District commercial salmon fishery came in well above the forecast range of 40,000 to 70,000 chum salmon and within the forecast range of 30,000 to 60,000 coho salmon. Norton Sound commercial salmon harvest was 118,672 chum, 193 sockeye, 53,754 coho, and 8,251 pink salmon (Table 1). Also, there were 151 Chinook, 54 sockeye, 48 coho, 87 pink, and 37

chum salmon kept for personal use. The buyer was not able to buy Chinook salmon in Subdistricts 5 and 6, per department emergency order, and chose not to buy Chinook salmon in other subdistricts.

Large chum salmon harvests in conjunction with high prices paid for coho salmon accounted for nearly all \$1,183,236 paid to 124 permit holders in 2013 (Appendices A2 and A3). The 2013 exvessel value ranks third highest and represents the third year since 2010 in which exvessel value has exceeded 1 million dollars (Appendix A3).

Commercial chum salmon harvest in 2013 was the highest in over 25 years. Southern Norton Sound (Subdistricts 4–6) accounted for the bulk of the commercial harvest. Subdistrict 4 (Norton Bay) had a record chum and coho salmon harvest. Commercial chum salmon harvest was also robust in Subdistrict 6 (Unalakleet), which ranked third highest. The chum salmon run was weaker in northern Norton Sound with the exception of Subdistrict 1 (Nome) and Port Clarence District. Subdistrict 2 (Golovin) and Subdistrict 3 (Elim) had the second-highest and fourth-highest coho salmon harvests on record, respectively.

The pink salmon harvest of 8,251 fish was well below the forecast of 50,000 to 100,000 fish. The low harvest was probably due to the existence of only one pink salmon directed fishing period. Both the buyer and fishermen expressed interest in having chum salmon directed fishing periods because of the higher price per pound of chum salmon.

The coho salmon harvest of 53,802 fish was below the recent 5- and 10-year average harvests of 73,080 fish and 76,695 fish, respectively (Appendix A13). Although there were near record to record harvests in Subdistricts 2 and 4, they make up a smaller portion of the overall catch in Norton Sound. The larger harvests usually came from Subdistricts 5 and 6, but in 2013, catches in those subdistricts ranged from only 36% to 66% compared to the recent 5- and 10-year averages (Appendix A10 and A11). Some of this can be attributed to weather during the month of August, particularly in Subdistrict 5. High surf conditions only diminished for brief periods during many scheduled openings in August, which caused several permit holders to lose interest and pursue other endeavors.

The number of permit holders (124) participating in the commercial fishery this year was above average and was the highest number of participants since 1993 (Appendix A2). The previous 5-year average in Norton Sound was 108 permits fished, and the previous 10-year average was 78 permits fished (Appendix A2). The increased fishing effort in the salmon fishery since 2010 is largely the result of stronger chum salmon runs, improved market interest, and high dock prices for salmon, particularly coho salmon. Dock prices per pound for Norton Sound salmon in 2013 were \$0.22, \$0.55, \$1.49, and \$1.77 for pink, chum, sockeye, and coho salmon, respectively (Appendix A4). Chinook salmon were not purchased by the buyer in 2013. Average commercial weights by species were 7.6 lb for coho salmon, 2.9 lb for pink salmon, and 6.9 lb for chum salmon (Appendix A5).

Only one salmon buyer operated in Norton Sound during the 2013 season. The Unalakleet fish plant operated by Norton Sound Seafood Products was the base of commercial fisheries operations. Salmon were both delivered to the Unalakleet dock and tendered from Subdistricts 2–5. Subdistrict 1 catch was delivered by the single permit holder to the Nome plant.

Subsistence Fishery Season Summary

Subsistence salmon fishermen in Port Clarence District, Cape Woolley Subdistrict, and Subdistricts 1–3 were required to possess a subsistence salmon fishing permit for each household that fished in these locations. Households may obtain and fish permits for multiple areas. Return rates for these permits have been close to 100% in most years, and in 2013 the return rate was 100% for the third year in a row (Table 2).

In southern Norton Sound, in 2013, postseason household surveys were conducted in Koyuk, Shaktoolik, and Unalakleet, and attempts were made to contact 100% of the households. Catch information for Subdistricts 4–6 are in Appendices A9–A11. Unlike in 2012, the villages of Stebbins and St. Michael were not surveyed in 2013.

In Norton Sound District, there are limits on subsistence salmon harvests only in Subdistrict 1 (Nome), where salmon limits have been in place since 1985. Also, hook and line subsistence fishermen must follow sport fish bag limits except in the Subdistrict 1 subsistence zones, where they can catch the subsistence limit. In 2013, an average chum salmon run was forecasted for Subdistrict 1 and the subdistrict was not closed to salmon fishing in mid-June for the eighth year in a row. From 1991 through 2005, Subdistrict 1 was closed to subsistence salmon fishing in mid-June in order for ADF&G to determine the run strength of chum salmon before allowing fishing. Furthermore, Tier II regulations were not in effect in 2013 because the chum salmon run was projected to exceed the amount necessary for subsistence (ANS).

In Port Clarence District, subsistence permits are required and a separate permit is required for Pilgrim River and for Salmon Lake. There are no salmon harvest limits in Port Clarence District, except for Kuzitrin River, Pilgrim River, and Salmon Lake.

Beginning in 2007, regulations allowed for cash sales of up to \$200 worth of subsistence-taken finfish per household, per year, in the Norton Sound–Port Clarence Area only, and starting in 2013 the amount allowed was raised to \$500. In 2013, ADF&G increased efforts to remind residents about the permit requirement when selling subsistence-caught finfish and 18 permits were issued, which resulted in cash sales of almost \$2,000 (Appendix A34).

Season Summary by Subdistrict

Nome–Norton Sound Subdistrict 1

In Subdistrict 1, 2013 chum salmon run abundance was projected to achieve the subdistrict-wide biological escapement goal (BEG) range of 23,000–35,000 chum salmon and amounts necessary for subsistence (ANS) range of 3,430–5,716 chum salmon. As such, a Tier II fishery was not implemented in 2013. There has not been a Tier II fishery implemented since 2005, and Tier II subsistence fishing restrictions were rescinded early during the 2004 and 2005 seasons.

Regulation changes made at 2013 Alaska Board of Fisheries meeting allowed for subsistence gillnet fishing 7 days a week in marine waters in the eastern half of Subdistrict 1, and beach seining was allowed in all subsistence locations during the chum salmon run when gillnet fishing was open. Excellent marine subsistence catches of chum salmon were reported in late June and early July in eastern Subdistrict 1. Aerial surveys were conducted in mid-July of the eastern Nome Subdistrict drainages (Flambeau, Eldorado, and Bonanza rivers) and Sinuk River in the western Nome Subdistrict. Several thousand chum salmon were observed on these surveys in the lower reaches of these drainages. The Eldorado River, Nome River, and Snake River weir counts

exceeded the chum salmon escapement goal ranges in 2013. Consequently, chum salmon subsistence gillnet fishing proceeded on the standard freshwater schedule, and the marine schedule for western Subdistrict 1 was extended from 3 days a week to 5 days a week. Several beach seining opportunities were also issued via emergency order to increase the efficiency of subsistence chum and pink salmon harvests during optimal drying weather periods.

The Subdistrict 1 BEG of 23,000–35,000 chum salmon has been achieved 4 of the last 5 years. However, achievement of the goal is often a result of better and more productive chum salmon runs east of Cape Nome disproportionately contributing to the BEG. The chum salmon escapement goal range for the Eldorado River, which is east of Cape Nome, is double the combined escapement goal range of the Nome and Snake rivers, both of which are west of Cape Nome, highlighting the disparity in river productivity within the subdistrict. In the last 5 years, the Eldorado River has exceeded the chum salmon escapement goal range in 4 years, and the Nome and Snake rivers have met or exceeded their escapement goal ranges in 3 years (Appendix A22–A23 and A26). Although chum salmon runs are greater east of Cape Nome (Appendix A32), for pink salmon the run strength is much greater west of Cape Nome (Appendix A33). Both the Nome and Sinuk rivers have much larger runs of pink salmon, particularly in even-numbered years, compared to rivers east of Cape Nome. Nome River has the only pink salmon escapement goal in Subdistrict 1, and the odd-year goal of 3,200 pink salmon was easily exceeded (Appendix A26).

No coho salmon escapement goals have been established in Subdistrict 1, but the escapement in Nome and Snake rivers was about in the mid-range compared to 10 previous years of sufficient escapement estimates with no large-scale flooding events.

In 2013 there were 477 subsistence salmon permits issued for the Nome Subdistrict, slightly below the 483 permits issued last year and below the record 494 permits issued during the 2010 season. All 477 permits issued were returned (Table 2).

Reported subsistence harvest was 48 Chinook, 3,065 chum, 845 pink, 1,804 coho, and 211 sockeye salmon (Appendix A6). The chum salmon harvest was the fourth highest since 1990, but it was somewhat less than expected based on the large abundance of chum salmon available for harvest. However, increased fishing opportunity in 2013 for sockeye salmon at Pilgrim River may have shifted some effort from Subdistrict 1. The pink salmon harvest was comparable to most odd-numbered years in the last 20 years, and the coho salmon harvest was average compared to the recent 5- and 10-year harvest averages.

Golovin–Norton Sound Subdistrict 2

The Subdistrict 2 regulatory salmon management plan limits 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 mid-July, the chum salmon run can be assessed and fishing time adjusted accordingly. The counting tower project on the Niukluk River had been used to evaluate escapement in the Golovin Subdistrict from 1995–2012, but the project was eliminated in 2013. The Niukluk River is a tributary of Fish River, a major salmon-producing river in the Golovin Subdistrict. Telemetry studies in the early 2000s showed an average of 33% of the chum salmon in the Fish River drainage pass the Niukluk River tower (Todd et al. 2005).

There was no commercial chum salmon fishing in Golovin Subdistrict from 2002 to 2007, largely because escapements, in most of those years, had fallen short of the lower bound SEG of greater than 30,000 fish for the Niukluk River (Appendix A25). Consequently, ADF&G has implemented a conservative approach with respect to determining when commercial fishing may occur. Early indicators of 2013 chum salmon abundance to Golovin Subdistrict were limited to scant subsistence catch reports of fair catches. ADF&G had concerns about the chum run because the adjacent Subdistrict 3 counting tower at Kwiniuk River was having near record low counts. In 16 of the previous 18 years, if Kwiniuk River counting tower reached or did not reach its chum salmon escapement goal, then Niukluk River counting tower was in agreement for those years in reaching or not reaching the chum salmon escapement goal. Aerial surveys did show larger numbers of chum salmon in the Fish River drainage compared to Kwiniuk River escapement counts and 2 directed chum salmon fishing periods were allowed beginning the third week of July with mediocre catches.

As a result of chum salmon conservation concerns, the pink salmon directed commercial fishery (4.5 in or smaller gillnet mesh size) could not commence until July 14 per the management plan for Subdistricts 2 and 3. On July 17, commercial pink salmon fishing commenced in Golovin Subdistrict with a 48 hour opening. The harvest of 1,028 pink salmon was below average.

Commercial coho salmon fishing periods commenced on August 1 with 24-hour fishing periods. Coho salmon catches were above average, and there were 3 more 36-hour fishing periods the first 2 weeks of August followed by three 48-hour fishing periods the last 2 weeks of August. The coho salmon harvest was the second highest on record, and aerial surveys of Niukluk River and Ophir Creek confirmed that the combined aerial survey goal of 950–1900 coho salmon used in the early 2000s had been exceeded.

The commercial catch in Golovin Subdistrict for 2013 including personal use was 5,362 coho, 1,180 pink, and 3,113 chum salmon caught by 14 permit holders (Table 4). The number of permit holders participating in the fishery was tied with last year and both were the highest since 1998.

This was the tenth year that subsistence salmon permits were required, and 153 permits were issued for Golovin Subdistrict in 2013. Reported harvest was 47 Chinook, 3,256 chum, 3,655 pink, 964 coho, and 15 sockeye salmon (Appendix A7). The number of salmon reported harvested (7,937) ranked fourth lowest in the 2000s.

Elim–Norton Sound Subdistrict 3

The Subdistrict 3 management plan directs ADF&G to project that chum salmon escapement goals will be reached and ensure that harvestable surpluses will be in excess of subsistence needs before directed chum or pink salmon commercial fishing is allowed. Further, in times of low chum salmon abundance, directed pink salmon commercial fishing may not occur before July 7 in the subdistrict. By this date, historical data indicate that the bulk of the chum salmon run is in river, and commercial pink salmon fishing would be expected to have little impact on chum salmon escapement or subsistence needs.

Early indicators of chum salmon abundance to Elim Subdistrict were limited to scant subsistence catch reports of fair catches in marine waters. However, early projections of chum salmon escapement as indexed by the Kwiniuk River tower counts indicated a very weak run, with the tower-based OEG range of 11,500–23,000 chum salmon unlikely to be achieved. Although there

could have been pink salmon directed commercial fishing periods after July 6, the permit holders expressed no interest because of the lower run size during an odd-numbered year. Late in the season there were 2 directed chum salmon commercial fishing periods, restricted to an area west of the Kwiniuk River mouth. Chum catches were sparse with a harvest of 850 chum salmon (Table 5).

The first directed coho salmon fishing period began on August 1 with a 24-hour opening. Good catches combined with sufficient escapement counts at Kwiniuk River counting tower allowed coho salmon directed fishing periods ranging from 36 to 48 hours for the remainder of the month.

The commercial catch in Elim Subdistrict including personal use was 6 Chinook, 27 sockeye, 6,675 coho, 601 pink, and 1,434 chum salmon caught by 21 permit holders (Table 5). The 2013 Elim coho salmon harvest ranks fourth best historically but is slightly below the 5-year average harvest because the 3 highest harvests occurred in the last 5 years (Appendix A8).

There were 64 subsistence salmon permits issued for Elim Subdistrict in 2013. The number of salmon reported harvested (3,921) was the second lowest since harvest estimation methods were standardized in 1994. Estimated subsistence harvests by species were 39 Chinook, 15 sockeye, 1,515 coho salmon, 1,134 pink salmon, and 1,218 chum salmon. Chinook salmon harvest was a record low since estimation methods were standardized (Appendix A8). Also, the Kwiniuk River Chinook salmon escapement count (15) was the lowest since the 1970s.

Norton Bay–Norton Sound Subdistrict 4

Historically, Norton Bay Subdistrict has had difficulty attracting a buyer due to its remoteness and its reputation for watermarked fish. Until recently, Norton Bay Subdistrict has typically been managed based on Shaktoolik and Unalakleet Subdistricts salmon run assessments due to a lack of ground-based escapement projects in Norton Bay. However, in 2011, an enumeration tower project was initiated by NSEDC on the Inglutalik River to provide an index of salmon escapement to Norton Bay. Currently, the Inglutalik River escapement counts are considered ancillary to comparative catch statistics for inseason management until a longer time series of escapement data becomes established.

In 2008, a small-scale commercial salmon fishery occurred in Norton Bay Subdistrict for the first time since 1997, and 4 permit holders participated. ADF&G again opened the commercial salmon fishery in 2009 and 7 permits holders participated. In 2010, there were 5 permit holders participating in the fishery, which was limited due to a combination of inadequate tendering capacity in early July, mechanical breakdowns on tender vessels in August, and reduced fishery participation probably due to concurrent fisheries prosecuted in the Elim and Shaktoolik Subdistricts (permit data on file with ADF&G, Division of Commercial Fisheries; Nome).

In 2011 effort nearly doubled to 12 permit holders, and in 2012 there were 18 permit holders fishing in Norton Bay Subdistrict and a record 49,970 pink salmon were harvested. In 2013 there was a record catch of 36,021 chum and 5,485 coho salmon by 18 permit holders (Table 6).

The first chum salmon fishing period began on June 25 and periods were 48 hours twice a week until mid-July, when fishing periods were increased to 72 hours twice a week. Longer periods were allowed because chum salmon escapement at Inglutalik counting tower was tracking double the commercial catch. Coho salmon directed fishing periods of 48 hours twice a week began on August 2, and the last fishing period ended on September 5.

Cumulative commercial catch by species for Norton Bay Subdistrict including personal use was 8 Chinook, 4 sockeye, 5,485 coho, 487 pink, and 36,021 chum salmon. The final escapement estimate at Inlitalik River tower was 860 Chinook, 5,904 coho, 268,537 pink, and 61,259 chum salmon (Appendix A29). The coho salmon estimate was a minimum estimate because high water precluded counting the entire run.

This was the sixth consecutive year that household subsistence salmon surveys were conducted in the village of Koyuk. Surveys were conducted from 1994 to 2003, but funding limitations precluded surveys of Koyuk during the 2004–2007 seasons. There were 76 households that were successfully contacted out of a possible 82 in 2013. Results from these households were expanded to estimate harvests by species, gear type, and location (e.g., Inlitalik River, Ungalik River, Koyuk River, Mukluktulik River, and marine waters) for those households not surveyed (Appendix A9).

An estimated 123 Chinook, 2 sockeye, 826 coho, 1,341 pink, and 3,853 chum salmon were reported as subsistence harvest in Norton Bay Subdistrict in 2013 and ranked fourth highest out of the last 6 years (Appendix A9).

Shaktoolik and Unalakleet–Norton Sound Subdistricts 5 and 6

Both Subdistricts 5 and 6, which share a common boundary, consistently attract commercial markets due to larger volumes of fish and better transportation services. Management actions typically encompass both subdistricts because salmon tend to intermingle, and harvest in one subdistrict affects the movement of fish in the adjacent subdistrict. Results from ADF&G's test net in Unalakleet River (Kent 2010), North River tower counts, and subsistence fishermen interviews in Unalakleet had been used to set early fishing periods in both subdistricts. However, the test net project was discontinued in 2013. This year ADF&G used the North River tower counts to assess run strength along with commercial and subsistence catches and, later in the run, counts from the Unalakleet River weir, which is much farther upstream. Radiotelemetry projects in the Unalakleet River drainage have shown that a large percentage of the Chinook salmon run spawns in the North River compared to chum and coho salmon (Estensen et al. 2005; Estensen and Hamazaki 2007; Joy et al. 2005; Joy and Reed 2006, 2007; Wuttig 1998 and 1999). Aerial surveys are only useful for late-season escapement assessment because of the long travel time between the fishing and spawning grounds.

In Subdistricts 5 and 6, directed commercial Chinook salmon fishing has only occurred in 2 of the previous 11 years, and in only 1 year since 2001. Restrictive action was taken in the subsistence and sport fisheries from 2003 to 2004 and from 2006 to 2013. As forecasted, a weak run of Chinook salmon to Shaktoolik and Unalakleet Subdistricts in 2013 precluded commercial fisheries directed on Chinook salmon but also led to a significant amount of foregone chum salmon harvest surplus. As a consequence of the poor Chinook salmon run, directed chum salmon fishing was delayed until July 1 per the Shaktoolik and Unalakleet Subdistricts management plan.

Estimated 2013 Chinook salmon escapements from the Unalakleet River mainstem and its major tributary, North River, were 767 and 564 fish, respectively, and were the lowest ever recorded (data on file with ADF&G, Division of Commercial Fisheries; Nome). Subsistence Chinook salmon harvests in Subdistrict 5 and 6 were the lowest recorded since survey methods were standardized in 1994, with 136 and 468 fish, respectively (Appendices A10 and A11).

Despite the late start to commercial fishing in Subdistricts 5 and 6, the chum salmon commercial harvest was well above average. The Subdistrict 5 harvest (23,268) ranked third highest and the Subdistrict 6 harvest (54,873) ranked the highest out of the last 20 years of commercial harvests, respectively (Appendices A10 and A11). Initially ADF&G started with 24-hour chum salmon periods the first week of July to protect Chinook salmon. Good catches of chum salmon in both subdistricts combined with low Chinook salmon incidental harvest resulted in the department increasing to 48-hour fishing periods the second week of July and then increasing to two 72-hour fishing periods per week in both Subdistricts 5 and 6 beginning the third week of July until the end of the month.

The commercial fishing schedule for coho salmon for Subdistricts 5 and 6 went into effect in early August with two 48-hour fishing periods per week. During the last decade commercial coho salmon harvests were the highest on record in Norton Sound District (Appendix A13), but they have recently returned to average levels prior to the record harvests from 2006–2008. In Subdistrict 5 coho salmon harvest declined for the third consecutive year with a harvest of 6,890 coho (Appendix A10). Subdistrict 5 fishermen had to contend with relatively severe local surf conditions in August, which may in part explain why Shaktoolik coho salmon harvests declined this season despite increased commercial harvests elsewhere in Norton Sound compared to last year (Appendices A6–A11).

The Subdistrict 6 commercial harvest of 29,390 coho salmon ranked twelfth highest in the last 20 years and represented a 32% increase from the 2012 harvest of 22,274 (Appendix A11).

Escapement

Table 3 and Appendix A17 summarize escapement assessments for the major index river systems of Norton Sound and Port Clarence Districts in 2013. Appendices A22–A31 present passage numbers for Chinook, chum, coho, pink, and sockeye salmon at various enumeration projects in Norton Sound. Aerial survey assessments are indices and relative to historical escapement sizes.

Escapement projects in Norton Sound include counting towers on North, Inglutalik, and Kwiniuk rivers; sonar on Shaktoolik River; and weirs on Unalakleet, Snake, Nome, Solomon, Eldorado, and Pilgrim rivers, and in Glacial Creek, which flows from Glacial Lake into Sinuk River.

Escapement project operations were a result of multiple collaborators, including ADF&G, NSEDC, BLM, and Unalakleet IRA. All projects supplied important daily information to ADF&G that was very useful for management of local salmon resources and will become more important the longer they operate. Funding sources for projects come from USFWS Office of Subsistence Management, NSEDC, and ADF&G.

Aerial survey assessment conditions were fair to poor during July and August of 2013; as a result, there were very few aerial surveys flown.

Chinook Salmon

Chinook salmon escapement was estimated to be very weak in many locations in 2013. A record low 15 Chinook salmon were counted at the Kwiniuk River tower, which was well below the lower end of the SEG range of 300–550 fish (Appendix A24). Also, a record low escapement of 564 Chinook salmon at the North River tower was less than half the lower end of the escapement goal range of 1,200–2,600 Chinook salmon (Appendix A30). Final escapement at the Unalakleet

River weir was 767 Chinook salmon, which was the lowest count in the 4-year project history (Appendix A31). Surprisingly, preemptive measures, additional marine mesh-size restrictions, and eventual early closures were not sufficient to achieve Chinook salmon escapement goals in Subdistrict 6.

Chum Salmon

Chum salmon escapement goals were achieved in 5 of 8 established Norton Sound chum salmon runs. The Kwiniuk River tower-based goal was not achieved. The former Niukluk River tower-based goal could not be determined because the project is no longer operational. Tubutulik River's escapement goal was not evaluated because the aerial survey was not conducted during the peak spawning stage.

Subdistrict 1 ended up having its largest chum salmon escapement in over 20 years. Estimated subdistrict-wide escapement of chum salmon was 108,120 fish, 209% above the upper bound of the subdistrict-wide biological escapement goal (BEG) range of 23,000–35,000 chum salmon (Table 3; Appendix A21). Subdistrict 1 escapements of chum salmon have exceeded the upper bound of the escapement goal range in 8 of the last 13 years of the established goal. As in previous years, the majority (62%) of the chum salmon escapement occurred in rivers east of Cape Nome. However, Sinuk River, west of Cape Nome, had the largest estimated escapement for an individual river system, contributing 31,691 chum salmon or 29% of the subdistrict-wide escapement (Appendix A32).

Escapement at Kwiniuk River tower was 5,631 chum salmon, only slightly above the record low count of 5,577 chum salmon observed in 2012 (Appendix A24). This was the second consecutive season that escapement fell well short of the optimal escapement goal (OEG) range of 11,500–23,000 chum salmon. However, escapement of chum salmon to the neighboring Tubutulik River may have narrowly met the OEG range of 9,200–18,400 fish, based on a July 9 aerial survey of 4,532 chum salmon in the lower reaches of the watershed (Table 3). To the west in Subdistrict 2, the peak spawning ground aerial survey of the Niukluk River tributary of the Fish River was 17,203 chum salmon (Table 3). This year's survey count suggests that actual ground-based escapement of chum salmon to the Niukluk River tower was near the former tower-based sustainable escapement goal (SEG) threshold of $\geq 23,000$ fish.

As with harvest patterns, southern Norton Sound drainages showed comparably strong chum salmon escapements in 2013. For example, Norton Sound's largest chum salmon producer, the Unalakleet River drainage, had its second largest escapement on record. The estimated escapement was 124,471 chum salmon (based on aggregate tower and weir counts) in 2013 (Table 3).

In Port Clarence District, chum salmon runs were also strong in 2013. Escapement of chum salmon to the Pilgrim River was 47,557 fish, which established a new record high count for the Pilgrim River floating weir project (Appendix B2). The previous record escapement was 45,361 chum salmon set in 2006.

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. Escapement data are not available over a long time series for several streams because few projects counted the coho salmon run prior to the early 2000s due to funding limitations. More

recent Norton Sound escapement assessment projects have been funded to monitor coho salmon as well as chum salmon and are becoming increasingly important to fisheries management.

There are only 2 coho salmon escapement goals in Norton Sound, and both are aerial survey goals. The North River goal of 550–1,100 was achieved with an aerial survey estimate of 867 fish in 2013 (Table 3). The Kwiniuk River goal of 650–1,300 was probably achieved because, although no survey was flown, the final tower count was 3,940 fish (Table 3).

The previous aerial survey goal for Niukluk River and Ophir Creek was 950–1,900 coho salmon, but it was eliminated with a Niukluk River tower goal of 2,400–7,200 coho salmon. A combined aerial survey count of 2,353 coho salmon of Niukluk River and Ophir Creek indicates that both former escapement goals would have been reached (Table 3).

Both the Snake (1,203) and Nome (2,624) rivers' weir projects had counts near the median for coho salmon (Appendix A23 and A26).

Pink Salmon

For over 25 years, pink salmon runs to Norton Sound have followed an odd- and even-numbered year cycle, with even-numbered year runs typically much higher in abundance than odd-numbered years. Pink salmon escapement estimates were successfully obtained from all ground-based escapement projects in 2013. There are 3 pink salmon escapement goals in Norton Sound: Nome River (3,200), Kwiniuk River (8,400), and North River (25,000). In almost all years the goals are reached, and the goals were likewise reached in 2013 (Table 3).

Sockeye Salmon

River spawning sockeye salmon are typically found in small numbers throughout Norton Sound District. Glacial Lake (Nome Subdistrict) and Salmon Lake (Port Clarence District) support populations of lake-spawning sockeye salmon and constitute the northernmost populations of any significance of sockeye salmon in North America. Salmon Lake spawning populations seldom exceeded 10,000 fish in years previous to 2003, whereas from 2003 to 2007 there were near-record to record runs of sockeye salmon. Likewise, Glacial Lake saw an upswing in sockeye salmon returns beginning in 2004, and a record count of 11,135 sockeye salmon occurred in 2005 (Appendix A28).

In 2008, sockeye salmon escapement dropped off at both Glacial Lake and Salmon Lake, and in 2009 sockeye salmon counts further declined at both Glacial Lake weir and Pilgrim River weir. The Glacial Lake weir is operated at Glacial Creek near the outlet of the lake and about 1 mile upstream from the confluence with the Sinuk River, and 826 sockeye salmon were counted in 2009, the lowest count since the weir project started in 2000 (Appendix A28). The 2009 Salmon Lake sockeye salmon run was also the lowest since Pilgrim River weir began operations in 2003, with 953 sockeye salmon counted through the weir (Appendix B2).

Sockeye salmon escapements in these 2 systems increased in 2010, although not by much. Sockeye salmon escapement in 2010 at Glacial Lake was 1,047 fish, tying 2002 for the third lowest count since the project began in 2000 (Appendix A28). Pilgrim River weir sockeye salmon escapement in 2010 was 1,654 fish, which was the second lowest on record (Appendix B2).

The escapement at Glacial Lake weir in 2012 of 1,636 sockeye salmon was just slightly less than the 2011 escapement; the same goes for the Pilgrim River weir escapement of 7,085 sockeye salmon.

Improving sockeye salmon runs occurred at both Glacial and Salmon lakes in 2013. An estimated 2,544 sockeye salmon were enumerated at Glacial Lake weir, and 12,428 sockeye salmon were enumerated at the Pilgrim River weir in 2013 (Appendices A28 and B2). The 2013 Glacial Lake weir count was a 55% increase from the 1,636 sockeye salmon counted in 2012. Similarly, the 2013 Pilgrim weir count represents a 75% increase from the 2012 weir count of 7,085 sockeye salmon (Appendix B2). An August 13 aerial survey count of 6,971 sockeye salmon was greater than the 5,830 and 5,144 sockeye salmon observed during the 2011 and 2012 aerial surveys, respectively. The 2013 season signifies the third consecutive season in which the Grand Central River/Salmon Lake aerial survey SEG range of 4,000–8,000 has been achieved, but unlike the 2 previous years, the Pilgrim River was not closed to subsistence salmon fishing. A total of 1,366 sockeye salmon was also observed at Glacial Lake, making 2013 the first season since 2010 that the Glacial Lake aerial survey SEG range (800–1600 sockeye salmon) has been evaluated and achieved.

Enforcement

Fishing regulations are primarily enforced by the Department of Public Safety, Alaska Wildlife Troopers (AWT). Two AWT officers patrolled the Norton Sound District 2013 commercial salmon fisheries in Unalakleet, and one AWT officer patrolled the Nome area. In addition, Nome ADF&G Division of Commercial Fisheries has 7 deputized staff with the ability to issue citations, of which 2 worked the commercial salmon fishery in Shaktoolik and Unalakleet Subdistricts. The subsistence fishery had no official patrol, but random checks were conducted by 2 ADF&G personnel.

2014 NORTON SOUND SALMON OUTLOOK

Salmon outlooks and harvest projections for the 2014 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 salmon run is expected to be very weak and similar to the 2013 run, with no commercial fishing targeting Chinook salmon expected. Additional preemptive subsistence restrictions are also likely for southern Norton Sound in order to conserve Chinook salmon to reach escapement goals. These restrictions include preemptive closures or reductions in fishing time in marine waters, inriver closures to gillnets with a mesh size greater than 4.5 in, and 6 in or less mesh size restrictions in marine waters. However, beach seining subsistence opportunity will be provided early in the run to allow the take of other, more plentiful species like pink and chum salmon.

Chum salmon runs are expected to be average in southern Norton Sound Subdistricts (Norton Bay, Shaktoolik, and Unalakleet) based on the recent 5-year trend of average to above-average chum salmon abundance in southern Norton Sound and sibling relationship analyses. As a result, directed chum salmon fishing is anticipated to commence as early as the third week of June in Norton Bay Subdistrict but no earlier than July 1 in Shaktoolik and Unalakleet Subdistricts because of Chinook salmon conservation concerns. In 2014, northern Norton Sound chum salmon runs are expected to be below average to average. Chum salmon abundance is anticipated to be sufficient to reach escapement goals and perhaps provide for a limited chum salmon

commercial harvest in Subdistricts 2 (Golovin) and 3 (Elim). A limited commercial fishery for chum salmon is possible in Nome Subdistrict dependent on a sufficient chum salmon run to obtain escapement goals throughout the subdistrict. Overall projected commercial harvest of chum salmon in Norton Sound is expected to range between 80,000–110,000 fish with an increased contribution to this harvest expected for Norton Bay Subdistrict due to improvements in tendering capacity, a good forecast, and a flexible management plan.

ADF&G expects the pink salmon run to be average for an even-numbered year, and dependent on buyer interest the harvest could be 250,000–500,000 fish. No subsistence fishing restrictions for pink salmon are expected.

The coho salmon run in 2014 is expected to be average based on recent 5-year trends in abundance and ocean conditions, as well as parent-year escapements and freshwater rearing conditions for the 2010 brood year. Northern Norton Sound contributions to the coho salmon run are expected to be below average to average, based on less-than-favorable freshwater rearing conditions. Conversely, southern Norton Sound runs of coho salmon in 2014 are expected to range from average (Subdistricts 5 and 6) to above average (Subdistrict 4) based on favorable freshwater rearing conditions. Considering these factors collectively, the commercial harvest is expected to range from 60,000 to 90,000 coho salmon. Coho salmon subsistence fishing restrictions are not expected.

2013 PORT CLARENCE SALMON FISHERY

Commercial Fishery Season Summary

No commercial salmon fishing was allowed in 2013. ADF&G had projected, and later confirmed by counts from the Pilgrim River weir, that the sockeye salmon run for Pilgrim River in 2013 would not reach the inriver goal of 30,000 sockeye salmon that is necessary for a commercial fishery to occur.

Subsistence Fishery Season Summary

Subsistence fishing permits have been required for Pilgrim River since 1964, and beginning in 2003 the number of permits issued has skyrocketed with the record sockeye salmon runs in the mid-2000s. In 2013 a record 265 permits were issued, surpassing the previous record in 2008 when 255 permits were issued (Menard et al. 2012). Pilgrim River estimated subsistence harvests by species were 8 coho salmon, 48 pink salmon, 2,761 sockeye salmon, and 282 chum salmon (Table 2). This was the first year since 2008 that subsistence salmon gillnet fishing was not closed during part of the season on Pilgrim River.

The size of the Pilgrim River sockeye salmon run greatly affects the number of issued subsistence permits. The first year of the great runs of sockeye salmon (2003), there were 100 permits issued. In 2004, there were 223 permits issued (permit data on file with ADF&G, Division of Commercial Fisheries; Nome). For comparison, in 2002 only 25 permits were issued, and a counting tower in operation that year at the same location as the present-day weir estimated less than 4,000 sockeye salmon passing (Appendix B2).

Although permits have been required in the Pilgrim River drainage for 50 years, 2013 was only the tenth year that permits were required throughout Port Clarence District. The number of subsistence salmon permits issued for all waters of Port Clarence District, excluding Pilgrim

River and Salmon Lake, was 162 permits, compared to 147 permits issued last year. Salmon Lake was opened in September in the northeast section and 4 permits were issued (Table 2).

Escapement

Aerial surveys are not typically flown in Port Clarence District except for Salmon Lake because higher priority is assigned to Nome Subdistrict and surrounding areas where commercial fishing occurs. Aerial surveys had shown an increasing trend of sockeye salmon returns to Salmon Lake since 1990 (Appendix B1). However, the sockeye salmon run crashed beginning in 2009, and ADF&G has had to have subsistence fishing restrictions on Pilgrim River in 4 of the last 5 years. An aerial survey in 2012 of Salmon Lake and Grand Central River estimated 4,730 sockeye salmon in Salmon Lake and 1,100 sockeye salmon in Grand Central River, a tributary to Salmon Lake. The combined aerial survey count of 6,971 sockeye salmon in 2013 was higher than both the 2012 (5,830) and 2011 (5,144) counts, and was the third time in a row the escapement goal has been reached since 2008 (survey data on file with ADF&G, Division of Commercial Fisheries; Nome). The combined aerial survey escapement goal for Salmon Lake and Grand Central River is 4,000–8,000 sockeye salmon (Table 3).

Salmon Lake had an average sockeye salmon spawning population of roughly 12,500 fish in the 5 years previous to 2003. But from 2003 to 2007, sockeye salmon escapements skyrocketed, and average weir count for the 5-year period was almost 56,000 sockeye salmon (Appendix B2). Average count for the next 5 years decreased greatly, to less than 8,000 sockeye salmon. From 2012 to 2013, the count improved by 75%, from 7,085 to 12,428 sockeye salmon (Appendix B2).

Enforcement

In 2013, one AWT officer patrolled Pilgrim River in Port Clarence District.

2014 PORT CLARENCE SALMON OUTLOOK

The guideline harvest range (GHR) set by BOF for the Port Clarence commercial sockeye salmon fishery allows for a harvest of up to 10,000 sockeye salmon. Based on recent history, ADF&G expects that the inriver goal of 30,000 sockeye salmon for Pilgrim River will not be met; therefore, no commercial fishing is expected in 2014. In addition, based on escapement and smolt data, the sockeye salmon run is expected to drop, and subsistence fishing restrictions may occur during the second week of July or later, if necessary. Chum and pink salmon are expected to have sufficient runs allowing for subsistence fishing.

ADF&G will compare the 2014 run with sockeye salmon escapement counts at the weir from the last few years and determine whether any subsistence fishing restrictions are needed.

2013 KOTZEBUE SOUND SALMON FISHERY

Commercial Fishery Season Summary

The Kotzebue Sound District commercial salmon fishery opened on July 10 and closed after the August 31 fishing period. Similar to the previous year, there was a very strong run of chum salmon and again commercial fishing time was limited, mostly in August, because of insufficient cargo space on airplanes to get the catch out to processing facilities.

During most of July, there was sufficient airplane capacity for the fleet to fish 6 days a week and fishing periods were 4 to 8 hours in length. Starting in late July until the third week of August, periods were 4 hours or less because of the high catches during the traditional peak weeks of harvest. During the last week of August, fishing periods were increased to 12 hours a day as a result of decreasing catches, reduced fishing effort, and sufficient airplane capacity.

There were 66 permit holders who sold chum salmon in 2013 (Appendix C1). Of these, 65 permit holders sold fish to the major buyer, Great Pacific Seafoods. One catcher–seller sold to a second buyer, Maniilaq Services, Incorporated, and also to Kotzebue area residents. In late August, with the decreasing catches, Maniilaq began to buy from additional permit holders who had been previously selling to Great Pacific. Maniilaq purchased from 21 permit holders during the season. There was a 20% drop in the number of permit holders selling fish this year compared to last year (Appendix C1). The price per pound for chum salmon dropped 16% from last year (Appendix C3) and may have been a factor in the number of permit holders fishing this season.

The overall chum salmon run to Kotzebue Sound in 2013 was estimated to be well above average based on commercial harvest rates, subsistence fishermen reporting good catches, and the Kobuk test fish index being the highest in the 21-year project history (Table 10).

The commercial harvest of 319,062 chum salmon was the highest since the 1980s (Appendix C1). There were 67 chum salmon kept for personal use included in the commercial harvest total. Also kept for personal use were 16 Chinook salmon, 13 sockeye salmon, 42 pink salmon, 43 coho salmon, 302 Dolly Varden, 705 sheefish, and 50 whitefish (Table 9). However, there were likely some additional fish kept for personal use that did not get reported on fish tickets.

A total of 2,555,304 pounds of chum salmon (average weight 8.0 lbs) were sold at an average of \$0.27 per pound (Appendices C2 and C3). The total exvessel value was \$689,163. The average value for each participating permit holder was \$10,442. The total exvessel value was almost two and a half times that of the average from the last 20 years (Appendix C4).

In the Kotzebue fishery, gear is limited to set nets with an aggregate of no more than 150 fathoms per permit holder. Fishermen generally operate with an end on or near shore and with all 3 shackles connected. Fishermen also set in deeper channels in the mud flats farther out from shore. Most gear used in the district is 5.875 in (14.9 cm) or 6 in (15.2 cm) stretch mesh gillnet.

Age, sex, and length (ASL) composition was taken from commercial catch samples but was not used to manage the fishery. The majority of the chum salmon each year are usually 4- and 5-year-old fish. In 2013, commercial catch samples were 4% age-0.2 fish, 54% age-0.3 fish, 40% age-0.4 fish and 2% age-0.5 fish. Historical comparisons showed the catch samples falling within the range of previous years (<http://www.adfg.alaska.gov/CommFishR3/WebSite/AYKDBMSWebsite/Default.aspx>).

Subsistence Fishery Season Summary

Subsistence household salmon surveys were regularly conducted in Kotzebue District from 1990 to 2004 by the Division of Subsistence (DOS), and again starting in 2012, when comprehensive subsistence fish harvest data were collected from 6 Kotzebue area villages by DOS. In 2012, total subsistence chum salmon reported caught was 26,693 salmon, more than in 2003 and 2004, the last 2 years that the same 6 villages were surveyed (Appendices C5 and C6), and subsistence chum harvest per household averaged 70 salmon for Kobuk River villages (Appendix C7).

Subsistence survey information from 2013 is not yet available, but funding is available for DOS to conduct surveys through 2014 (Nikki Braem, Subsistence Resource Specialist, ADF&G, Fairbanks; personal communication).

Escapement

This year's test fishing chum salmon CPUE cumulative index at ADF&G test fish project on Kobuk River near Kiana was 2,698 points and was a record index at the Kobuk River test fish project (Table 10). The Kobuk River test net catch samples were 6% age-0.2 fish, 33% age-0.3 fish, 60% age-0.4 fish and 1% age-0.5 fish. Historical comparisons show the catch samples falling within the range of previous years. High and turbid water prevented aerial surveys of the Kobuk River and Noatak River drainages in 2013.

Enforcement

One AWT officer patrolled the Kotzebue Sound District 2013 commercial salmon fishery.

2014 Kotzebue Salmon Outlook

The outlook for the 2014 season is based on the parent-year returns and returning age classes observed in the commercial catch samples and in the test fishing catch samples from the Kobuk River in 2013. During the 2014 season, the 4-year-old component of the run is expected to be above average based on the 3-year-old return. The 5-year-old component of the run is expected to be average based on the 4-year-old return this past season. The 3-year-old and 6-year-old age classes are much smaller components of the run and are expected to be average (age data on file with ADF&G, Division of Commercial Fisheries; Nome). The commercial harvest is expected to fall within the range of 250,000 to 275,000 chum salmon, if market conditions can accept that level of harvest.

SECTION 3: PACIFIC HERRING FISHERIES

2013 NORTON SOUND PACIFIC HERRING FISHERY

Sac Roe

In contrast to last year when there was no herring sac roe fishery, there was a fishery in 2013 and 490 tons of sac roe herring were harvested by 40 permit holders (Table 11). The majority of the sac roe herring harvest was from the Cape Denbigh area (Subdistrict 3). Historical information for the Norton Sound commercial sac roe fishery can be found in Appendix D2 and Menard et al. 2013. Other historical fisheries information is presented in Appendices D1 and D3.

Spawn-on-Kelp

There was no market interest expressed in the commercial spawn-on-wild-kelp (*Fucus* sp.) or *Macrocystis* spawn-on-kelp fisheries in 2013.

Bait Fishery

Two tons of herring were bought as bait during the sac roe fishery.

Commercial Fishery Management

ADF&G projection for the 2013 herring spawning biomass for Norton Sound was 58,594 tons. At 20% exploitation rate, the guideline harvest level (GHL) for the Norton Sound District fishery was 11,719 tons with 11,399 tons allocated to the sac roe fishery. NSEDC was successful at developing a market for 800–1,200 tons of sac roe herring in 2013. However, only 41–61% of the desired harvest was obtained before the floating processor had to depart for Bristol Bay salmon fishery on June 21 (Appendix D2). As in 2010, extensive pack ice in the northern Bering Sea delayed the arrival of tender and processing vessels in Norton Sound. Additionally, extensive shorefast ice in southern Norton Sound also severely hampered fishing effort during the second week of June when herring spawning biomass was building in the St. Michael (Subdistrict 1) and Cape Denbigh (Subdistrict 3) Subdistricts. With the exception of Shaktoolik, permit holders had difficulty departing from southern Norton Sound villages until after June 10 due to shorefast ice. Even though the harvest was small, roe recovery averaged 13.2%, the third highest on record and the third consecutive season that roe percentages have exceeded 13% (Appendix D2).

A temporary lead in shorefast ice allowed the ADF&G field crew to deploy for Cape Denbigh from Unalakleet on June 10 to conduct test fishing operations. The 2013 season was the first season since 2008 in which test fishing operations were conducted throughout the entire herring spawning season. Test fishing operations commenced on morning of June 11. The test fishery crew's first successful variable-mesh gillnet (VMG) haul occurred on June 12 when 51 herring were sampled from a catch of 306 herring on the western end of Cape Denbigh in front of Elim Beach. Approximately 85% of the catch occurred in the 2.0-inch mesh panel of the VMG. Test fish operations were conducted daily morning and evening from June 12–18 and a total of 452 VMG samples were collected, the majority originating from the Elim Beach area. During this

time, the crew also collected 615 samples from tender vessels operating in the Cape Denbigh Subdistrict throughout the duration of the fishery (data on file with ADF&G, Division of Commercial Fisheries; Nome). The crew departed the Cape Denbigh area on June 18 because the fishery was winding down and they wanted to avoid forecasted hazardous surf conditions that would have significantly delayed their return to Unalakleet.

Catch Reporting and Enforcement

No AWT officers were on Norton Sound herring grounds during the 2013 fishery because of the ice conditions preventing a sac roe fishery. Catch reporting for the bait fishery was sufficient for the limited harvest, and a final report was submitted to ADF&G.

Biomass Determination

There were no Norton Sound herring aerial surveys conducted this season by NSEDC or ADF&G biologists because of ice conditions that made surveying and accurately estimating herring biomass impossible.

2014 NORTON SOUND PACIFIC HERRING OUTLOOK

The 2014 projected biomass for Norton Sound District is 52,138 tons. A 20% exploitation rate would result in a GHM of 10,428 tons. 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 10,108 tons for sac roe harvest. The beach seine harvest is allocated 10% of the sac roe projected harvest, or 1,011 tons. The 2014 herring fishery will be opened by emergency order and the fishery will close by emergency order when up to 20% of the available herring biomass has been harvested. Varied harvest rates may be applied to individual subdistricts based on biomass distribution, roe quality, weather, and sea ice conditions. Herring ages 6 and 7 are expected to make up 30% of the returning biomass (Appendix D13). Herring age 8 and older are expected to make up 64% of the biomass. If there are more favorable ice conditions in 2014, ADF&G expects to conduct a more comprehensive test fishery, and a commercial sampling program is anticipated for the 2014 season to obtain more representative age class data from the spawning biomass and harvest.

SECTION 4: KING CRAB FISHERIES

NORTON SOUND CRAB FISHERY

Abundance

The ADF&G length-based population model estimated harvestable legal male crab biomass for the 2013 summer commercial crab fishery at 4.13 million lb (1.56 million crab), a decrease of 2% from the revised model biomass estimate of 4.22 million lb (1.56 million crab) for legal male crab for 2012. An exploitation rate of 12% on the harvestable population equates to a guideline harvest level (GHL) of 495,600 lb of crab. This follows the revised harvest strategy set in regulation by the BOF in March of 2012. By regulation, the CDQ fishery is allocated 7.5% of the GHL; therefore, the CDQ harvest quota was set at 37,170 lb preseason, with the open access fishery allocation set at 458,430 lb.

Summer Open Access Commercial Fishery

The 2013 summer open access commercial crab fishery was opened by emergency order at noon on July 3 in the Norton Sound Section, with a GHL of 458,430 pounds of crab. Two companies, Norton Sound Seafood Products (NSSP) and Aquatech, were registered to buy crab, and 5 fishermen registered to sell crab dockside as catcher–sellers or catcher–processors. NSSP operated a seafood processing plant in Nome and 2 tenders in eastern Norton Sound. A fisherman based in Unalakleet shipped live crab via airplane to Aquatech in Anchorage. The majority of crab was delivered to NSSP, whereas the catcher–sellers sold crab directly to local residents as well as to NSSP. The 2 catcher–processors sold to a live market in Korea and to NSSP.

The first open access delivery was made on July 5 and final delivery was made September 15, the day after the open access portion of the fishery was closed by emergency order at 6:00 PM, for a total season length of 74 days, compared to 44 days in 2012 (Table 12). This year, the season start was delayed for a few days because NSSP found poor meat fill in some of their test fishery crab; however, once the open access season was under way, both land-based buyers purchased crab continuously with no further reports of poor crab meat fill until the very end of the season.

In 2013, catch rate was poor for the entire fleet and by the end of July the projected trend line showed that if the catch rate did not change, the quota would not be reached until the second half of September. On August 1, to allow the fleet to efficiently obtain the allowable harvest of red king crab, the closure line south of Nome from 166°15'W (Sledge Island) and 163°30'W (near Square Rock) was moved by emergency order north by 3 miles, to 64°18'N from 64°15'N (Appendix E11). On August 7, to allow more of the fleet additional fishing opportunity, the closure line between 162°38'W (Carson Creek) and 162°W (the eastern border of statistical area 626401) was moved by emergency order north by 5 miles to 64°15'N, and the closure line between 162°W and 161°30'W (Cape Denbigh) was also moved north, by 3 miles to 64°18'N (Appendix E11). Catch rates increased slightly and temporarily for the portion of the fleet that fished in the western half of Norton Sound but did not improve for the crabbers fishing in the east side of Norton Sound. By the second half of August, the trend line projected the quota would not be

reached. Because most of the registered buyers were still interested in purchasing crab, the fishing time was extended from September 3 to September 10, by which time a few newly molted crab had shown up in the fishery. A shorter extension was granted, to September 13, but safety concerns due to adverse marine conditions resulted in the final closure date of September 14.

The open access harvest from fish ticket reports was 124,485 red king crab or 373,278 lb (81% of the open access quota; Table 12). Of this total, 882 lb were reported as deadloss and 6,248 lb as personal use. A total of 33 vessels and 33 permit holders made 435 landings, and average weight for commercially caught crab was 3.0 lb. Including CDQ, the number of pots registered was 1,420, and there were 15,058 pot pulls, for a season CPUE of 9 crab. In 2013, the total catch rate tracked very closely to 2009; these 2 years had the lowest catch rates out of the last 6 years (Appendix E9). Average price paid (including CDQ catch) was \$5.63 per lb, the highest amount ever paid (Appendix E3). Exvessel value of the fishery (including CDQ) was \$2.165 million, second only to the record-setting amount paid out in 2012 of \$2.556 million, the highest since 1994 when Norton Sound was designated a superexclusive area, which effectively changed the character of the fishery from a large vessel to a small vessel fishery (Appendix E10).

CDQ Fishery

For the fourth time in the last 5 years, the CDQ fishery opened concurrently with the open access fishery in 2013. The first CDQ delivery was made on July 16 and the last delivery was made September 15, when 18,585 lb (50% of the allocated 37,170 lb) had been harvested, for a total length of 74 days (Table 12 and Appendix E1). In 2013, as in the previous 6 years, YDFDA transferred their CDQ quota to NSEDC; however, due to the poor catch rate all season, NSEDC only harvested their original half of the CDQ quota, resulting in the first time in 10 years that the fishery did not harvest all, or nearly all, of the allocation. Seven permit holders were registered to fish the CDQ fishery, but only 4 fished, making a total of 25 landings and 862 pots lifts. Average price paid to fishermen was \$5.50 per lb, for an exvessel value of \$101,250 for the CDQ fishery. This was the thirteenth year a CDQ harvest occurred since the CDQ fishery was implemented in 1998.

Harvest Areas and Commercial Catch Sampling

Fish ticket reports document fourteen statistical areas were fished in the open access and CDQ fisheries (Table 13), compared to 9 areas in 2012. Unlike last year, the top harvest came from statistical area 656401 (38%). As the crabbers moved around more this year trying to find the crab, their harvests came from a larger area instead of being concentrated as in years past. Several statistical areas yielded harvests of 9–15%: 646401 (15%), 656402 (10%), 626401 (9%), 636401 (9%), and 666401 (9%). Except for statistical area 656402, which was temporarily opened this year, all the other listed statistical areas are directly south of the original closed boundary line (Appendix E11). The catch from statistical areas east of 164°W longitude made up 23% of the harvest, less than half of the 56% last year (Appendices E1 and E12).

Carapace length (CL) measurements and shell age were collected from 6,072 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). Male new-shell crab made up 91% of the total legal crab sampled, and old-shell crab made up 9%. Recruit crab are new-shell legal crab < 116 mm CL. Postrecruit crab are legal new-shell male crab \geq 116 mm CL and all legal old-shell males.

Recruit crab made up 32% of the legal crab sampled and postrecruit crab made up 68%, the highest percentage of postrecruit crab since 2006 (Appendix E4). Overall mean carapace length of legal male crab was 120 mm. For comparison of historical length composition of Norton Sound red king crab summer commercial harvests from 1990 to 2013, see Appendices E15–E20.

Enforcement

No AWT trooper made dockside checks during the 2013 summer crab fishery; however, an ADF&G staff member who worked the king crab fishery was deputized to cite violations if necessary.

Winter Commercial Fishery

The winter commercial season opened November 15, 2012, and 34 fishermen registered. One land-based processor (NSSP) and 2 land-based catcher–processors registered to buy crab, and 7 fishermen registered to sell crab dockside as catcher–sellers. Based on fish tickets submitted, the first landing was made December 22, 2012. From then until the last landing on May 15, when the season closed, the 26 fishermen that fished made a total of 495 landings, with an overall CPUE of 4 and an average weight of 2.75 lb/crab. Price of crab averaged \$6.73/lb, slightly higher than the \$6.47/lb price in 2012, and total exvessel value of the fishery was \$402,256, almost 3 times the amount from 2012 (\$150,569). A total of 22,639 crab (62,179 lb) were harvested, with percentages of crab sold (and CPUE) each month as follows: December 1% (2), January 11% (3), February 25% (4), March 26% (5), April 24% (3), and May 13% (3). Total number of crab harvested was over twice that of 2012 and over six times the average harvest from 1990 to 2012 (Appendix E5). As an indicator of nearshore ice stability, commercial fishermen reported losing 23 out of 389 pots (6%) during the 2012–2013 winter season. Pots were fished from 10 miles east to 18 miles west of Nome, excluding the area closed to commercial fishing from 3.5 miles east to 2.0 miles west of Nome. Similar to years previous to 2012, the majority of crabbers (16) and harvest (93%) came from the Nome area, with the remaining crabbers and harvest coming from Elim, Golovin, Shaktoolik, and St. Michael/Stebbins areas. Unlike last year, ice was unstable in most of eastern Norton Sound; therefore, no crabbers from Unalakleet even registered to fish the winter commercial crab fishery.

The harvest is generally divided between local residents who buy crab directly from the crabbers, the seafood plant (NSSP) in Nome, and other nonlocal markets such as Anchorage. Starting in 2013, the 2 catcher–processors shipped live crab to Korea. Most crabbers consider the winter commercial crabbing a sideline and hold other jobs. Usually, a few of the winter crab fishermen sell the majority of the crab.

Subsistence Fishery

Both a summer and a winter subsistence red king crab fishery occur in Norton Sound, although the majority of the effort and harvest is from the winter fishery (Appendices E5 and E6). During the 2012–2013 winter crab season, all but one of the 149 permits issued were returned, and the 104 permit holders that actually fished reported retaining 7,662 crab, similar to the 7,371 crab retained in 2012. The number caught, which included crab thrown back to the ocean, was 21,752 crab, the greatest amount caught since 1984, when records started to be kept of total crab caught; however, the amount kept was only the eighth highest since 1984. Incidental reports from subsistence crabbers in Nome indicated an unusually high number of smaller male crab and female crab caught in their pots, which resulted in many crab thrown back in the sea. Residents

of Brevig Mission, Diomedea, Elim, Golovin, St. Michael, Shaktoolik, Stebbins, Unalakleet, and White Mountain had a combined harvest of 983 crab, which was 13% of the total harvest. Out of 197 pots reported fishing, 4 (2%) were reportedly lost during the season due to moving ice (Appendix E7). Percentages of subsistence crab harvested each month are as follows: December 2%, January 6%, February 31%, March 35%, April 21%, and May 5%. Like 2012, more than 99% of the crab were caught with pots in 2013 (permit data on file with ADF&G, Division of Commercial Fisheries; Nome).

During the 2013 Norton Sound summer subsistence crab season, 47 permits were issued and 46 were returned. The 26 fishermen that actually fished reported harvesting a total of 1,865 crab, over half of which came from Nome area and over a third of which came from Unalakleet area, with the remainder harvested by villagers from Brevig Mission, Elim, or White Mountain. Crab kept per fisherman averaged 72 crab for summer 2013 (Appendix E6).

Sport Fishery

Sport fishermen can fish for crab, and a harvest log issued by the Nome office similar to a subsistence permit is required. Sport fishermen are only allowed to keep 6 male crab daily, and they must be of legal size (4.75 in or greater). The only recent harvest by sport fishermen was in 2005. That year, 9 harvest logs were issued and 8 were returned, showing that 6 nonresident sport fishermen caught 918 crab and kept 106, for an average harvest of 18 crab per fisherman (permit data on file with ADF&G, Division of Commercial Fisheries; Nome).

Future Resource Investigations

The triennial Norton Sound Trawl Survey will take place in the summer of 2014. Red king crab biomass estimates from the trawl survey are an integral part of the data used in the length-based population model to project the summer king crab legal biomass (during years when no trawl survey occurs) and appropriate GHL for the summer commercial king crab fishery.

A winter pot study that had been conducted annually in nearshore waters of Nome since the early 1980s was replaced with a much larger tagging project in the summer and fall of 2012 and 2013. Results of the winter project have been used in the length-based model to project the summer legal biomass and appropriate GHL for the upcoming summer commercial crab fishery. Size composition by year from the winter king crab project is shown in Appendix E8. This summer tagging project is planned for June 2014, and the results will be compared with previous winter tagging projects.

ST. LAWRENCE ISLAND CRAB FISHERY

Commercial Fishery

In 2006, the BOF split the St. Lawrence Island section between north and south of 66° N latitude. In the northern section, now known as the Kotzebue section, the commercial season was from noon June 15 through August 1. The southern section was merged with Norton Sound section. This change was initiated by Norton Sound area fishermen to expand fishing opportunity to an area with little commercial utilization since 1995. No harvest was reported from this new area in 2013. No permit holders fished in the Kotzebue section in 2013.

SECTION 5: MISCELLANEOUS SPECIES

INCONNU (SHEEFISH)

Commercial Fishery

Although inconnu, commonly known as sheefish, may have been harvested and sold in the winter of 2012–2013, no fish tickets were submitted to ADF&G. In Kotzebue Sound District, no fishermen reported selling inconnu (Appendix F1). Sheefish are not commonly found in either Norton Sound or Port Clarence Districts.

Subsistence and Sport Fishery

In 2012 and 2013, there were comprehensive subsistence surveys for fish and wildlife harvests of 6 Kotzebue area villages conducted by the Division of Subsistence. In 2012, surveyed households in 5 Kobuk River villages and Noatak reported harvesting 11,693 sheefish, more than any other year since 1990 (Appendix F2). However, because survey effort was limited during many years, harvest numbers should be considered minimal and are not comparable year to year. Information is not yet available for 2013.

Sport fish harvest reports indicate a harvest of 218 sheefish in Kotzebue Sound District in 2013 (Brendon Scanlon, Sport Fish Biologist, ADF&G, Fairbanks; personal communication). Sheefish sport harvests in the last 10 years have averaged approximately 850 annually (Appendix F3).

Escapement

No aerial surveys are flown to determine sheefish escapement. An ADF&G test fishing project on the Kobuk River helps to give an index of abundance, but the test fishery is operated to determine the index of chum salmon abundance and begins operation well after sheefish have begun to pass the site. In 2013, test fishing on Kobuk River resulted in 310 sheefish caught in 208 drifts, for a cumulative CPUE of 330. The CPUE ranked eleventh out of 16 years sheefish catches were recorded (data on file with ADF&G, Division of Commercial Fisheries; Nome).

DOLLY VARDEN

Commercial Fishery

Dolly Varden *Salvelinus malma* are occasionally incidentally caught in commercial salmon fisheries in Norton Sound and Kotzebue Districts. During the 2013 commercial salmon fishery, Kotzebue District reported 302 Dolly Varden caught but not sold, similar to last year when 300 were caught and not sold (Appendix F4).

Subsistence and Sport Fishery

Subsistence harvest data for Dolly Varden were not recorded for Norton Sound or Port Clarence, and household surveys for Dolly Varden subsistence catches were not conducted in Arctic communities. A comprehensive survey of fish harvests was done in Kobuk River villages and Noatak by the Division of Subsistence in 2012 and 2013. In 2012, surveyed Noatak households

reported harvesting 6,437 Dolly Varden (Appendix F5). Information is not yet available for 2013.

Sport fish harvest was 1,184 Dolly Varden in Norton Sound and 1,074 Dolly Varden in Kotzebue/Chukchi Sea areas in 2013 (Appendix F3). Overall, Dolly Varden sport fish harvests in the last 10 years in Norton Sound averaged over 3,000 annually, with most fish harvested out of the Unalakleet River (Appendix F6).

Escapement

Dolly Varden escapement is determined from aerial surveys conducted by ADF&G Sport Fish Division in the Kotzebue area, and weir or tower counts in Norton Sound. In 2013, a survey on the Wulik River counted a total of 23,312 Dolly Varden, although the count should be considered a rough estimate because counting conditions were poor due to the presence of river ice (Appendix F7).

WHITEFISH

Commercial Fishery

Commercial whitefish harvest information for the 2012–2013 season was 105 pounds in Norton Sound District (Appendix F9).

Subsistence and Sport Fishery

Subsistence harvest data for whitefish were not recorded for Norton Sound, Port Clarence or Arctic Districts, but a comprehensive survey of fish subsistence harvests by the Division of Subsistence was conducted in Kobuk River villages and Noatak in 2012 and 2013. In 2012, survey data showed that 41,229 whitefish were harvested for 6 villages in Kotzebue District (Appendix F8). Information is not yet available for 2013. Harvest numbers are considered minimal and are not comparable year to year. For the sport fishery, no harvest data are collected in Norton Sound, Port Clarence, or Kotzebue Sound Districts for whitefish.

SAFFRON COD

Commercial Fishery

During the 2012–2013 season, 25 permit holders harvested 33,939 lb of saffron cod *Eleginus gracilis*, commonly known as tomcod, in Norton Sound and sold them to a commercial buyer at \$0.50/lb for use as bait (Appendix F10).

Subsistence and Sport Fishery

In Norton Sound areas tomcod are primarily fished by “jigging” through the ice. Because no subsistence permit is required and a sport fish license is not needed for Alaska residents in northern Norton Sound from Cape Prince of Wales to Bald Head, harvests of tomcod are not reported or documented. In 2013, Norton Sound household subsistence surveys were conducted; however, subsistence harvest information of tomcod was not collected.

CAPELIN

Commercial Fishery

No reported commercial fishery has occurred for capelin *Mallotus villosus*, although there are substantial stocks in northern Norton Sound (Pahlke 1985).

Subsistence

Because no subsistence permit for capelin is required, accurate harvests of capelin are not reported or documented. In 2013, one of the latest capelin spawning events observed on Nome beaches occurred on July 19, compared to mid-June in most years when capelin are observed spawning on Nome beaches. Many residents harvested capelin with various gear, such as nets, buckets, plastic bags, and shovels. No other information on capelin harvest is available.

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TABLES

Table 1.–Norton Sound commercial salmon harvest summary by subdistrict, 2013.

| | | Subdistricts | | | | | | Total |
|----------------------------------|--------------|--------------|--------|--------|---------|---------|---------|-----------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | |
| Number of Fishermen ^a | | 1 | 14 | 21 | 18 | 24 | 57 | 124 |
| Chinook ^b | Number | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Weight (lbs) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sockeye | Number | 0 | 0 | 21 | 4 | 40 | 128 | 193 |
| | Weight (lbs) | 0 | 0 | 168 | 30 | 286 | 932 | 1,416 |
| Coho | Number | 0 | 5,362 | 6,651 | 5,485 | 6,890 | 29,366 | 53,754 |
| | Weight (lbs) | 0 | 41,189 | 51,185 | 40,290 | 54,052 | 223,295 | 410,011 |
| Pink | Number | 0 | 1,180 | 598 | 454 | 14 | 6,005 | 8,251 |
| | Weight (lbs) | 0 | 3,039 | 1,708 | 1,613 | 45 | 17,719 | 24,124 |
| Chum | Number | 0 | 3,113 | 1,412 | 36,021 | 23,268 | 54,858 | 118,672 |
| | Weight (lbs) | 0 | 22,144 | 10,164 | 252,242 | 162,299 | 374,082 | 820,931 |
| Total | Number | 0 | 9,655 | 8,682 | 41,964 | 30,212 | 90,357 | 180,870 |
| | Weight (lbs) | 0 | 66,372 | 63,225 | 294,175 | 216,682 | 616,028 | 1,256,482 |

Note: An additional 151 Chinook, 54 sockeye, 48 coho, 87 pink, and 37 chum salmon were retained for personal use. Average commercial weights by species were 7.34 lb for sockeye salmon, 7.63 lb for coho salmon, 2.92 lb for pink salmon, and 6.92 lb for chum salmon.

^a Number of fishermen is unique number of permit holders that fished in each subdistrict. Some permit holders fished in more than 1 subdistrict. Subdistrict 1 catch is confidential and is not included in total.

^b The buyer did not buy Chinook salmon in 2013; all were retained for personal use.

Table 2.–Subsistence salmon harvest for northern Norton Sound, 2013.

| | Permits Fished ^a | Number of salmon harvested | | | | | Total |
|--|-----------------------------|----------------------------|--------------|--------------|--------------|---------------|---------------|
| | | Chinook | Sockeye | Coho | Pink | Chum | |
| Marine Waters | 50 | 36 | 161 | 609 | 372 | 2,194 | 3,372 |
| Bonanza River | 14 | 0 | 0 | 76 | 41 | 140 | 257 |
| Cripple Creek | 6 | 0 | 0 | 19 | 0 | 0 | 19 |
| Eldorado River – above weir | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Eldorado River – below weir | 17 | 1 | 0 | 108 | 56 | 344 | 509 |
| Flambeau River | 4 | 0 | 0 | 19 | 1 | 25 | 45 |
| Safety Sound | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nome River – above weir | 11 | 0 | 1 | 9 | 22 | 4 | 36 |
| Nome River – below weir | 162 | 10 | 18 | 480 | 211 | 177 | 896 |
| Penny River | 9 | 0 | 0 | 27 | 43 | 0 | 70 |
| Sinuk River | 34 | 0 | 26 | 80 | 19 | 43 | 168 |
| Snake River – above weir | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Snake River – below weir | 74 | 1 | 4 | 301 | 80 | 134 | 520 |
| Solomon River | 14 | 0 | 1 | 75 | 0 | 4 | 80 |
| Nome Subdistrict Total ^b | 302 | 48 | 211 | 1,804 | 845 | 3,065 | 5,973 |
| Cape Woolley ^c | 3 | 0 | 0 | 0 | 0 | 1 | 1 |
| Marine Waters | 16 | 40 | 12 | 79 | 93 | 929 | 1,153 |
| Kachavik River | 8 | 2 | 1 | 7 | 1,627 | 834 | 2,471 |
| McKinley River | 5 | 0 | 0 | 24 | 2 | 0 | 26 |
| Chinik Creek | 5 | 1 | 0 | 88 | 11 | 0 | 100 |
| Fish River | 56 | 4 | 0 | 601 | 1,690 | 1400 | 3,695 |
| Niukluk River | 21 | 0 | 2 | 141 | 232 | 92 | 467 |
| Other Creeks/Rivers | 3 | 0 | 0 | 24 | 0 | 1 | 25 |
| Golovin Subdistrict Total ^d | 97 | 47 | 15 | 964 | 3,655 | 3,256 | 7,937 |
| Marine Waters | 15 | 5 | 4 | 523 | 342 | 592 | 1,466 |
| Kwiniuk River – above tower | 3 | 0 | 0 | 11 | 70 | 0 | 81 |
| Kwiniuk River – below tower | 35 | 18 | 7 | 649 | 572 | 515 | 1,761 |
| Next Creek | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tubutulik River | 10 | 12 | 0 | 265 | 134 | 110 | 521 |
| Iron Creek | 5 | 0 | 0 | 67 | 16 | 1 | 84 |
| Other Creeks/Rivers | 2 | 4 | 4 | 0 | 0 | 0 | 8 |
| Elim Subdistrict Total ^e | 45 | 39 | 15 | 1,515 | 1,134 | 1,218 | 3,921 |
| Port Clarence – Marine Waters | 93 | 36 | 2,041 | 609 | 1,587 | 4,402 | 8,675 |
| Tuksuk Channel | 13 | 2 | 428 | 34 | 133 | 1,446 | 2,043 |
| Imuruk Basin | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Agiapuk River | 3 | 0 | 0 | 0 | 20 | 448 | 468 |
| Kuzitrin River | 6 | 0 | 9 | 0 | 0 | 10 | 19 |
| Salmon Lake | 2 | 0 | 4 | 0 | 0 | 0 | 4 |
| Pilgrim River – above weir | 62 | 0 | 807 | 8 | 6 | 172 | 993 |
| Pilgrim River – below weir | 89 | 0 | 1,954 | 0 | 42 | 110 | 2,106 |
| Port Clarence District Total ^f | 265 | 38 | 5,243 | 651 | 1,788 | 6,588 | 14,308 |
| Total | 712 | 172 | 5,484 | 4,934 | 7,422 | 14,128 | 32,140 |

^a There were 7 locations where subsistence permits were issued in 2013 for northern Norton Sound: 1-Nome Subdistrict; 2-Cape Woolley; 3-Golovin Subdistrict; 4-Elim Subdistrict; 5-Pilgrim River; 6-Salmon Lake; and 7-Port Clarence District. Except for Pilgrim River and Salmon Lake, each permit is valid for both marine and fresh waters. Permits fished include those permit holders who fished but reported no harvest.

^b All 477 Nome Subdistrict permits issued were returned.

^c All 19 Cape Woolley permits issued were returned.

^d All 153 Golovin Subdistrict permits issued were returned.

^e All 64 Elim Subdistrict permits issued were returned.

^f All 265 Pilgrim River and 4 Salmon Lake permits issued were returned. All 162 Port Clarence District permits issued were returned.

Table 3.–Salmon counts of rivers and associated salmon escapement goal ranges (SEG, BEG or OEG), Norton Sound and Port Clarence, 2013.

| Stream | Chinook Salmon | | | | Chum Salmon | | | | |
|----------------------|-------------------------|-----------------------------|--|-----------------------------|-------------------------|-----------------------------|--|-------------------------------|-----------------------------|
| | Weir/ Tower Count | Escapement Goal Range | Aerial Survey Count ^a | Escapement Goal Range | Weir/ Tower Count | Escapement Goal Range | Aerial Survey Count ^a | Aerial Survey Expansion | Escapement Goal Range |
| Salmon L. | | | 0 | | | | 0 | | |
| Grand Central R. | | | 0 | | | | 0 | | |
| Agiapuk R. | | | | | | | | | |
| American R. | | | | | | | | | |
| Pilgrim R. | 47 | | | | 47,557 | | | | |
| Glacial L. | 0 | | | | 35 | | | | |
| Sinuk R. | | | 1 | | | | 19,500 | 31,691 | |
| Cripple R. | | | | | | | | | |
| Penny R. | | | | | | | | | |
| Anvil Creek | | | | | | | | | |
| Dry Creek | | | | | | | | | |
| Snake R. | 8 | | | | 2,755 | 1,600–2,500 ^b | | | |
| Nome R. | 9 | | | | 4,811 | 2,900–4,300 ^b | | | |
| Flambeau R. | | | | | | | 16,088 | 27,928 | |
| Eldorado R. | 9 | | | | 27,928 | 6,000–9,200 ^b | 16,859 | | |
| Bonanza R. | | | | | | | 5,284 | 13,437 | |
| Solomon R. | 0 | | | | 1,377 | | 156 | | |
| Nome Subdistrict | | | | | | 23,000–35,000 ^c | | 108,120 | |
| <u>Fish R.</u> | | | 15 | Combined | | | 2,550 | | |
| <u>Boston Cr.</u> | | | 19 | 100–250 | | | 16,100 | | |
| Niukluk R. | | | 68 | | | 23,000 | 17,203 | | |
| Ophir Cr. | | | | | | | | | |
| Kwiniuk R. | 15 | 300–550 | | | 5,631 | 11,500–23,000 ^d | | | |
| Tubutulik R. | | | 2 | | | 9,200–18,400 ^e | 4,532 | | |
| Ungalik R. | | | 17 | | | | 28,283 | | |
| Inglutalik R | 860 | | | | 61,259 | | 24,562 | | |
| Pikmiktalik R | | | | | | | | | |
| Shaktoolik R. | | | 151 | 400–800 | | | 11,878 | | |
| <u>Unalakleet R.</u> | 767 | | | Combined | 113,953 | | | | Combined |
| <u>Old Woman R.</u> | | | 168 | 550–1,100 | | | 367 | | 2,400–4,800 |
| North R. | 564 | | 339 | 1,200–2,600 | 10,518 | | 2,425 | | |

-continued-

Table 3.–Page 2 of 2.

| Stream | Coho Salmon | | | Sockeye Salmon | | | Pink Salmon | | |
|--------------------------|-------------------------|--|-----------------------------|-------------------------|--|-----------------------------|-------------------------|-----------------------------|--|
| | Weir/ Tower Count | Aerial Survey Count ^a | Escapement Goal Range | Weir/ Tower Count | Aerial Survey Count ^a | Escapement Goal Range | Weir/ Tower Count | Escapement Goal Range | Aerial Survey Count ^a |
| Salmon L. | | 0 | | | 5,820 | Combined | | | 0 |
| Grand Central R. | | 0 | | | 1,151 | 4,000–8,000 | | | 0 |
| Agiapuk R. | | | | | | | | | |
| American R. | | | | | | | | | |
| Pilgrim R. | 890 | | | 12,428 | | | 1,060 | | |
| Glacial L. | | | | 2,544 | 1,366 | 800–1,600 | 2 | | |
| Sinuk R. | | 1,054 | | | 39 | | | | 23,000 |
| Cripple R. | | | | | | | | | |
| Penny R. | | | | | | | | | |
| Anvil Creek | | | | | | | | | |
| Dry Creek | | | | | | | | | |
| Snake R. | 1,203 | | | 163 | | | 1,333 | | |
| Nome R. | 2,624 | | | 38 | | | 10,257 | 3,200 | |
| Flambeau R. | | | | | | | | | |
| Eldorado R. ^b | 15 | | | 0 | | | 1,025 | | |
| Bonanza R. | | 945 | | | | | | | 800 |
| Solomon R. | 178 | | | 3 | | | 2,733 | | |
| Fish R. | | | | | | | | | |
| Boston Cr. | | | Tower Goal | | | | | | |
| Niukluk R. | | 2,279 | 2,400–7,200 | | 0 | | | | 9,700 |
| Ophir Cr. | | 74 | | | | | | | |
| Kwiniuk R. | 3,940 | | 650–1,300 | 0 | | | 13,212 | 8,400 | |
| Tubutulik R. | | | | | | | 700 | | 700 |
| Ungalik R. | | 1,063 | | | | | | | 49,890 |
| Inglutalik R. | 5,904 | | | 0 | | | 268,537 | | 109,980 |
| Pikmiktalik R. | | | | | | | | | |
| Shaktoolik R. | | 271 | | | | | 10,400 | | |
| Unalakleet R. | 25,566 | | | 243 | | | 144,225 | | |
| Old Woman R. | | | | | | | | | |
| North R. | 8,834 | 867 | 550–1,100 | 12 | | | 46,668 | 25,000 | 5,025 |

Note: Data not available for all streams. Sustainable escapement goal (SEG), biological escapement goal (BEG), and optimal escapement goal (OEG) are listed.

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

^b The Alaska Board of Fisheries (BOF) also established an OEG with the same range as the BEG.

^c BOF-established OEG is the same range as the BEG and is based on a combination of weir counts and expanded aerial survey counts.

^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.

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

Table 4.–Commercial salmon set gillnet catches from Golovin, Subdistrict 2, Norton Sound, 2013.

| Period | Target species | Dates fished | Length (hours) | Permits fished | Chinook harvest | Chum harvest | Pink harvest | Sockeye harvest | Coho harvest |
|--------|----------------|--------------|----------------|----------------|-----------------|--------------|--------------|-----------------|--------------|
| 1 | Pink | 7/17–7/19 | 48 | 8 | 0 | 506 | 1,028 | 0 | 10 |
| 2 | Chum | 7/20–7/22 | 48 | 10 | 0 | 1,771 | 146 | 0 | 188 |
| 3 | Chum | 7/23–7/24 | 24 | 9 | 0 | 301 | 6 | 0 | 130 |
| 4 | Coho | 8/01–8/02 | 24 | 7 | 0 | 174 | 0 | 0 | 527 |
| 5 | Coho | 8/05–8/07 | 36 | 9 | 0 | 204 | 0 | 0 | 861 |
| 6 | Coho | 8/08–8/10 | 36 | 7 | 0 | 104 | 0 | 0 | 1,476 |
| 7 | Coho | 8/11–8/13 | 36 | 11 | 0 | 23 | 0 | 0 | 940 |
| 8 | Coho | 8/14–8/16 | 48 | 10 | 0 | 26 | 0 | 0 | 609 |
| 9 | Coho | 8/19–8/21 | 48 | 7 | 0 | 2 | 0 | 0 | 406 |
| 10 | Coho | 8/23–8/25 | 48 | 8 | 0 | 2 | 0 | 0 | 215 |
| Totals | | | 396 | 14 | 0 | 3,113 | 1,180 | 0 | 5,362 |

Table 5.–Commercial salmon set gillnet catches from Elim, Subdistrict 3, Norton Sound, 2013.

| Period | Target species | Dates fished | Length (hours) | Permits fished | Chinook harvest | Chum harvest | Pink harvest | Sockeye harvest | Coho harvest |
|--------|----------------|--------------|----------------|----------------|-----------------|--------------|--------------|-----------------|--------------|
| 1 | Chum | 7/20–7/22 | 48 | 6 | 0 | 618 | 184 | 2 | 23 |
| 2 | Chum | 7/24–7/25 | 24 | 11 | 0 | 232 | 300 | 1 | 141 |
| 3 | Coho | 8/01–8/02 | 24 | 12 | 0 | 54 | 36 | 0 | 457 |
| 4 | Coho | 8/05–8/07 | 36 | 12 | 0 | 86 | 43 | 1 | 537 |
| 5 | Coho | 8/08–8/10 | 36 | 14 | 0 | 46 | 20 | 0 | 944 |
| 6 | Coho | 8/11–8/13 | 36 | 15 | 0 | 45 | 9 | 6 | 750 |
| 7 | Coho | 8/14–8/16 | 48 | 18 | 0 | 40 | 1 | 0 | 880 |
| 8 | Coho | 8/19–8/21 | 48 | 15 | 0 | 70 | 0 | 1 | 870 |
| 9 | Coho | 8/23–8/25 | 48 | 16 | 0 | 97 | 2 | 2 | 884 |
| 10 | Coho | 8/27–8/29 | 48 | 16 | 0 | 105 | 2 | 8 | 745 |
| 11 | Coho | 8/30–8/31 | 40 | 9 | 0 | 19 | 1 | 0 | 420 |
| Totals | | | 436 | 21 | 0 | 1,412 | 598 | 21 | 6,651 |

Note: An additional 6 Chinook, 22 chum, 3 pink, 6 sockeye, and 24 coho salmon were retained for personal use in 2013.

Table 6.–Commercial salmon set gillnet catches from Norton Bay, Subdistrict 4, Norton Sound, 2013.

| Period | Target species | Dates fished | Length (hours) | Permits fished | Chinook harvest | Chum harvest | Pink harvest | Sockeye harvest | Coho harvest |
|--------|----------------|--------------|----------------|----------------|-----------------|---------------|--------------|-----------------|--------------|
| 1 | Chum | 6/25–6/27 | 48 | 5 | 0 | 1,388 | 0 | 0 | 0 |
| 2 | Chum | 6/28–6/30 | 48 | 8 | 0 | 4,323 | 0 | 0 | 0 |
| 3 | Chum | 7/02–7/04 | 48 | 9 | 0 | 5,137 | 0 | 0 | 0 |
| 4 | Chum | 7/05–7/07 | 48 | 12 | 0 | 5,755 | 0 | 0 | 0 |
| 5 | Chum | 7/09–7/11 | 48 | 9 | 0 | 3,660 | 0 | 0 | 2 |
| 6 | Chum | 7/12–7/15 | 48 | 11 | 0 | 4,350 | 0 | 0 | 5 |
| 7 | Chum | 7/16–7/19 | 72 | 9 | 0 | 3,280 | 0 | 2 | 91 |
| 8 | Chum | 7/20–7/23 | 72 | 3 | 0 | 1,935 | 131 | 0 | 228 |
| 9 | Chum | 7/25–7/27 | 72 | 12 | 0 | 1,948 | 308 | 0 | 821 |
| 10 | Chum | 7/28–7/31 | 64 | 10 | 0 | 1,513 | 8 | 0 | 1,220 |
| 11 | Chum | 8/02–8/04 | 72 | 13 | 0 | 689 | 4 | 0 | 556 |
| 12 | Coho | 8/05–8/07 | 48 | 6 | 0 | 467 | 0 | 0 | 569 |
| 13 | Coho | 8/09–8/11 | 48 | 11 | 0 | 528 | 3 | 0 | 758 |
| 14 | Coho | 8/12–8/14 | 48 | 7 | 0 | 349 | 0 | 0 | 337 |
| 15 | Coho | 8/15–8/17 | 48 | 6 | 0 | 247 | 0 | 0 | 391 |
| 16 | Coho | 8/19–8/21 | 48 | 6 | 0 | 221 | 0 | 0 | 333 |
| 17 | Coho | 8/23–8/25 | 48 | 4 | 0 | 179 | 0 | 0 | 148 |
| 18 | Coho | 8/27–8/29 | 48 | 3 | 0 | 52 | 0 | 2 | 26 |
| 19 | Coho | 8/30–9/01 | 48 | | | No One Fished | | | |
| 20 | Coho | 9/03–9/05 | 48 | | | No One Fished | | | |
| Totals | | | 1,072 | 18 | 0 | 36,021 | 454 | 4 | 5,485 |

Note: An additional 8 Chinook and 33 pink salmon were retained for personal use in 2013.

Table 7.–Commercial salmon set gillnet catches from Shaktoolik, Subdistrict 5, Norton Sound, 2013.

| Period | Target species | Dates fished | Length (hours) | Permits fished | Chinook harvest | Chum harvest | Pink harvest | Sockeye harvest | Coho harvest |
|--------|----------------|--------------|----------------|----------------|-----------------|---------------|--------------|-----------------|--------------|
| 1 | Chum | 7/02–7/03 | 24 | | | No One Fished | | | |
| 2 | Chum | 7/05–7/06 | 24 | 6 | 0 | 1,866 | 0 | 0 | 0 |
| 3 | Chum | 7/08–7/10 | 48 | 14 | 0 | 4,769 | 0 | 2 | 1 |
| 4 | Chum | 7/12–7/14 | 48 | 18 | 0 | 8,308 | 0 | 12 | 3 |
| 5 | Chum | 7/15–7/18 | 72 | 15 | 0 | 2,177 | 0 | 6 | 81 |
| 6 | Chum | 7/19–7/22 | 72 | 1 | 0 | 320 | 0 | 0 | 16 |
| 7 | Chum | 7/23–7/26 | 72 | 14 | 0 | 1,393 | 0 | 6 | 420 |
| 8 | Chum | 7/27–7/30 | 72 | 16 | 0 | 1,480 | 14 | 7 | 794 |
| 9 | Coho | 7/31–8/02 | 48 | 15 | 0 | 989 | 0 | 3 | 522 |
| 10 | Coho | 8/04–8/06 | 48 | 6 | 0 | 342 | 0 | 1 | 286 |
| 11 | Coho | 8/07–8/09 | 48 | 11 | 0 | 365 | 0 | 0 | 485 |
| 12 | Coho | 8/11–8/13 | 48 | 16 | 0 | 313 | 0 | 2 | 480 |
| 13 | Coho | 8/14–8/16 | 48 | 14 | 0 | 308 | 0 | 0 | 514 |
| 14 | Coho | 8/18–8/20 | 48 | 17 | 0 | 432 | 0 | 1 | 1,354 |
| 15 | Coho | 8/21–8/23 | 48 | 11 | 0 | 78 | 0 | 0 | 517 |
| 16 | Coho | 8/25–8/27 | 48 | 11 | 0 | 67 | 0 | 0 | 851 |
| 17 | Coho | 8/28–8/30 | 48 | 18 | 0 | 55 | 0 | 0 | 554 |
| 18 | Coho | 9/01–9/03 | 48 | 17 | 0 | 6 | 0 | 0 | 12 |
| 19 | Coho | 9/04–9/06 | 48 | | | No One Fished | | | |
| Totals | | | 960 | 21 | 0 | 23,268 | 14 | 40 | 6,890 |

Note: An additional 6 Chinook and 5 sockeye salmon were retained for personal use in 2013.

Table 8.—Commercial salmon set gillnet catches from Unalakleet, Subdistrict 6, Norton Sound, 2013.

| Period | Target species | Dates fished | Length (hours) | Permits fished | Chinook harvest | Chum harvest | Pink harvest | Sockeye harvest | Coho harvest |
|--------|----------------|--------------|----------------|----------------|-----------------|--------------|--------------|-----------------|--------------|
| 1 | Chum | 7/01–7/02 | 24 | 19 | 0 | 5,804 | 0 | 0 | 0 |
| 2 | Chum | 7/05–7/06 | 24 | 17 | 0 | 5,602 | 287 | 0 | 0 |
| 3 | Chum | 7/08–7/09 | 24 | 21 | 0 | 1,103 | 121 | 2 | 1 |
| 4 | Chum | 7/11–7/13 | 48 | 16 | 0 | 8,831 | 1,514 | 32 | 31 |
| 5 | Chum | 7/15–7/18 | 72 | 0 | 0 | 8,279 | 1,648 | 29 | 276 |
| 6 | Chum | 7/19–7/22 | 72 | 19 | 0 | 8,123 | 1,377 | 9 | 939 |
| 7 | Chum | 7/23–7/26 | 72 | 27 | 0 | 4,670 | 434 | 19 | 1,909 |
| 8 | Chum | 7/27–7/30 | 72 | 27 | 0 | 3,687 | 309 | 10 | 3,257 |
| 9 | Coho | 7/31–8/02 | 48 | 30 | 0 | 1,318 | 161 | 3 | 1,215 |
| 10 | Coho | 8/04–8/06 | 48 | 27 | 0 | 1,928 | 39 | 7 | 1,692 |
| 11 | Coho | 8/07–8/09 | 48 | 28 | 0 | 880 | 22 | 2 | 1,964 |
| 12 | Coho | 8/11–8/13 | 48 | 36 | 0 | 1,161 | 49 | 2 | 3,715 |
| 13 | Coho | 8/14–8/16 | 48 | 34 | 0 | 567 | 13 | 0 | 1,852 |
| 14 | Coho | 8/18–8/20 | 48 | 36 | 0 | 983 | 19 | 3 | 3,914 |
| 15 | Coho | 8/21–8/23 | 48 | 33 | 0 | 686 | 0 | 5 | 2,551 |
| 16 | Coho | 8/25–8/27 | 48 | 18 | 0 | 685 | 4 | 2 | 4,088 |
| 17 | Coho | 8/28–8/30 | 48 | 25 | 0 | 391 | 6 | 1 | 1,328 |
| 18 | Coho | 9/01–9/03 | 48 | 33 | 0 | 91 | 1 | 1 | 403 |
| 19 | Coho | 9/04–9/06 | 48 | 32 | 0 | 69 | 1 | 1 | 231 |
| Totals | | | 936 | 55 | 0 | 54,858 | 6,005 | 128 | 29,366 |

Note: There were an additional 131 Chinook, 15 chum, 51 pink, 43 sockeye, and 24 coho salmon retained for personal use in 2013.

Table 9.–Kotzebue District commercial chum salmon catch and average weight by date, 2013.

| Date | Number of fishermen | Catch | Pounds | Average weight |
|--------------|---------------------|----------------|------------------|----------------|
| 7/10 | 10 | 1,360 | 10,870 | 8.0 |
| 7/11 | 12 | 1,535 | 12,321 | 8.0 |
| 7/12 | 9 | 2,368 | 19,386 | 8.2 |
| 7/14 | 10 | 2,077 | 16,942 | 8.2 |
| 7/15 | 17 | 2,038 | 16,191 | 7.9 |
| 7/16 | 18 | 5,994 | 48,926 | 8.2 |
| 7/17 | 23 | 4,908 | 39,714 | 8.1 |
| 7/18 | 29 | 10,476 | 86,911 | 8.3 |
| 7/19 | 26 | 6,013 | 49,559 | 8.2 |
| 7/21 | 33 | 5,585 | 46,119 | 8.3 |
| 7/22 | 34 | 6,216 | 51,847 | 8.3 |
| 7/23 | 38 | 17,712 | 145,926 | 8.2 |
| 7/24 | 9 | 2,683 | 21,022 | 7.8 |
| 7/25 | 41 | 11,894 | 98,133 | 8.3 |
| 7/26 | 40 | 9,082 | 75,349 | 8.3 |
| 7/28 | 41 | 17,283 | 141,096 | 8.2 |
| 7/30 | 47 | 10,927 | 89,513 | 8.2 |
| 7/31 | 45 | 15,773 | 130,429 | 8.3 |
| 8/01 | 38 | 10,062 | 83,466 | 8.3 |
| 8/04 | 38 | 9,453 | 75,974 | 8.0 |
| 8/05 | 40 | 9,672 | 78,190 | 8.1 |
| 8/06 | 34 | 7,300 | 60,105 | 8.2 |
| 8/07 | 41 | 12,427 | 99,541 | 8.0 |
| 8/08 | 43 | 10,875 | 85,858 | 7.9 |
| 8/11 | 35 | 11,830 | 92,091 | 7.8 |
| 8/12 | 40 | 11,067 | 87,602 | 7.9 |
| 8/13 | 40 | 10,917 | 86,257 | 7.9 |
| 8/14 | 44 | 12,057 | 93,852 | 7.8 |
| 8/15 | 44 | 15,805 | 125,682 | 8.0 |
| 8/16 | 39 | 8,385 | 65,160 | 7.8 |
| 8/18 | 35 | 9,706 | 76,075 | 7.8 |
| 8/19 | 35 | 4,229 | 32,865 | 7.8 |
| 8/20 | 31 | 3,210 | 24,603 | 7.7 |
| 8/21 | 18 | 3,160 | 24,213 | 7.7 |
| 8/22 | 29 | 6,134 | 47,977 | 7.8 |
| 8/23 | 14 | 2,779 | 20,764 | 7.5 |
| 8/25 | 11 | 2,180 | 16,085 | 7.4 |
| 8/26 | 6 | 113 | 768 | 6.8 |
| 8/27 | 22 | 439 | 3,033 | 6.9 |
| 8/28 | 17 | 792 | 5,535 | 7.0 |
| 8/29 | 14 | 1,142 | 8,168 | 7.2 |
| 8/30 | 8 | 0 | 0 | |
| 8/31 | 8 | 0 | 0 | |
| Total | 65 | 297,658 | 2,394,118 | 8.0 |

Note: Catch by date is for Great Pacific Seafoods only. Maniilaq had a catch of 21,312 chum salmon (160,952 pounds) by 21 permit holders. There was one catcher–seller who reported a catch of 25 chum salmon (230 pounds). Both buyers and the catcher–seller signed waivers allowing ADF&G to report their harvest figures. Also harvested during the 2013 commercial fishery and kept for personal use were 16 Chinook, 67 chum, 13 sockeye, 42 pink, and 43 coho salmon, and 302 Dolly Varden, 705 sheefish, and 50 whitefish.

Table 10.—Historical chum salmon catch for Kobuk River drift test fishery, 1993–2013.

| Year | Dates of operation | Number of drifts | Cumulative CPUE ^a | Midpoint date |
|------|--------------------|------------------|------------------------------|---------------|
| 1993 | 7/12–8/12 | 164 | 494 | 8/03 |
| 1994 | 7/13–8/30 | 248 | 1,207 | 8/04 |
| 1995 | 7/12–8/16 | 196 | 1,188 | 8/02 |
| 1996 | 7/09–8/14 | 208 | 2,581 | 7/31 |
| 1997 | 7/09–8/14 | 202 | 797 | 8/03 |
| 1998 | 7/10–8/15 | 182 | 538 | 7/29 |
| 1999 | 7/11–8/13 | 176 | 1,357 | 8/02 |
| 2000 | 7/07–8/14 | 228 | 1,481 | 8/01 |
| 2001 | 7/05–8/13 | 232 | 1,575 | 7/26 |
| 2002 | 7/05–8/12 | 218 | 875 | 7/23 |
| 2003 | 7/09–8/13 | 214 | 749 | 8/02 |
| 2004 | 7/02–8/12 | 242 | 855 | 8/05 |
| 2005 | 7/07–8/15 | 207 | 1,207 | 8/06 |
| 2006 | 7/07–8/19 | 217 | 743 | 8/16 |
| 2007 | 7/11–8/20 | 207 | 1,342 | 8/09 |
| 2008 | 7/09–8/14 | 200 | 2,269 | 7/30 |
| 2009 | 7/10–8/20 | 242 | 971 | 8/06 |
| 2010 | 7/15–8/24 | 234 | 1,401 | 8/05 |
| 2011 | 7/13–8/21 | 220 | 2,499 | 8/10 |
| 2012 | 7/17–8/16 | 151 | 2,398 | 8/08 |
| 2013 | 7/17–8/25 | 208 | 2,698 | 8/06 |

^a Cumulative catch per unit of effort (CPUE) is calculated as the sum of daily CPUE during the period of data collection, and daily CPUE (I) is calculated as the number of fish that would have been caught if 100 fathoms of gillnet had been fished for 60 minutes. $I = (6,000 * C) / (L * T)$, where C = number of chum salmon caught, L = length of gillnet in fathoms, and T = mean fishing time in minutes.

Table 11.—Commercial herring sac roe harvest summary by subdistrict, Norton Sound District, 2013.

| | St. Michael Subdistrict (333-70) | | | Unalakleet Subdistrict (333-72) | | | Cape Denbigh Subdistrict (333-74) | | | Norton Sound District Total | | |
|-------|----------------------------------|--------------------|-------------|---------------------------------|--------------------|-------------|-----------------------------------|--------------------|-------------|-----------------------------|--------------------|-------------|
| | Number of permit holders | Sac roe short tons | Percent roe | Number of permit holders | Sac Roe short tons | Percent roe | Number of permit holders | Sac Roe short tons | Percent roe | Number of permit holders | Sac Roe short tons | Percent roe |
| Total | 27 | 107.1 | 13.6 | 17 | 82 | 13.4 | 17 | 301.5 | 13.0 | 40 | 490.6 | 13.2 |

Table 12.—Daily catch for the open access and CDQ summer commercial king crab harvests, Norton Sound Section, Eastern Bering Sea, July 3–September 14, 2013.

| Date ^a | Landings | Number of crab | Crab harvested (lbs) | Cumulative total (lbs) | Number pots Pulled | Average weight (lbs) | CPUE |
|-------------------|----------|----------------|----------------------|------------------------|--------------------|----------------------|------|
| Open Access | | | | | | | |
| 7/05 | 1 | 144 | 453 | 453 | 20 | 3.1 | 7 |
| 7/06 | 4 | 755 | 2,187 | 2,640 | 113 | 2.9 | 7 |
| 7/07 | 9 | 3,036 | 9,124 | 11,764 | 359 | 3.0 | 8 |
| 7/08 | 3 | 880 | 2,591 | 14,355 | 89 | 2.9 | 10 |
| 7/09 | 3 | 374 | 1,097 | 15,452 | 57 | 2.9 | 7 |
| 7/10 | 2 | 666 | 2,016 | 17,468 | 79 | 3.0 | 8 |
| 7/11 | 9 | 3,189 | 9,438 | 26,906 | 305 | 3.0 | 10 |
| 7/12 | 11 | 4,151 | 12,604 | 39,510 | 391 | 3.0 | 11 |
| 7/13 | 5 | 1,144 | 3,417 | 42,927 | 159 | 3.0 | 7 |
| 7/14 | 3 | 1,446 | 4,537 | 47,464 | 120 | 3.1 | 12 |
| 7/15 | 1 | 269 | 823 | 48,287 | 40 | 3.1 | 7 |
| 7/16 | 10 | 3,999 | 12,319 | 60,606 | 328 | 3.1 | 12 |
| 7/17 | 2 | 195 | 562 | 61,168 | 41 | 2.9 | 5 |
| 7/18 | 17 | 6,871 | 20,496 | 81,664 | 596 | 3.0 | 12 |
| 7/19 | 11 | 2,976 | 8,777 | 90,441 | 296 | 2.9 | 10 |
| 7/20 | 4 | 1,884 | 5,329 | 95,770 | 160 | 2.8 | 12 |
| 7/21 | 3 | 651 | 1,912 | 97,682 | 118 | 2.9 | 6 |
| 7/23 | 3 | 776 | 2,360 | 100,042 | 81 | 3.0 | 10 |
| 7/24 | 15 | 4,314 | 12,853 | 112,895 | 560 | 3.0 | 8 |
| 7/25 | 12 | 3,423 | 10,356 | 123,251 | 399 | 3.0 | 9 |
| 7/26 | 4 | 1,313 | 3,971 | 127,222 | 131 | 3.0 | 10 |
| 7/27 | 3 | 502 | 1,657 | 128,879 | 32 | 3.3 | 16 |
| 7/28 | 12 | 2,896 | 8,578 | 137,457 | 394 | 3.0 | 7 |
| 7/29 | 2 | 304 | 903 | 138,360 | 60 | 3.0 | 5 |
| 7/30 | 15 | 3,071 | 9,096 | 147,456 | 468 | 3.0 | 7 |
| 7/31 | 9 | 1,905 | 5,690 | 153,146 | 327 | 3.0 | 6 |
| 8/01 | 6 | 876 | 2,661 | 155,807 | 160 | 3.0 | 5 |
| 8/02 | 8 | 2,091 | 6,199 | 162,006 | 356 | 3.0 | 6 |
| 8/03 | 12 | 2,427 | 7,117 | 169,123 | 351 | 2.9 | 7 |
| 8/04 | 11 | 2,971 | 8,748 | 177,871 | 336 | 2.9 | 9 |
| 8/05 | 1 | 311 | 929 | 178,800 | 39 | 3.0 | 8 |
| 8/06 | 6 | 1,846 | 5,411 | 184,211 | 210 | 2.9 | 9 |
| 8/07 | 5 | 1,529 | 4,452 | 188,663 | 134 | 2.9 | 11 |
| 8/08 | 4 | 696 | 2,096 | 190,759 | 158 | 3.0 | 4 |
| 8/09 | 7 | 2,815 | 8,209 | 198,968 | 280 | 2.9 | 10 |
| 8/10 | 9 | 1,969 | 5,955 | 204,923 | 320 | 3.0 | 6 |
| 8/11 | 10 | 3,727 | 11,093 | 216,016 | 369 | 3.0 | 10 |
| 8/12 | 4 | 1,168 | 3,581 | 219,597 | 117 | 3.1 | 10 |

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Table 12.–Page 2 of 3.

| Date ^a | Landings | Number of crab | Crab harvested (lbs) | Cumulative total (lbs) | Number pots pulled | Average weight (lbs) | CPUE |
|-------------------|----------|-------------------|----------------------------|------------------------------|--------------------------|----------------------------|------|
| Open Access | | | | | | | |
| 8/13 | 6 | 1,917 | 5,714 | 225,311 | 194 | 3.0 | 10 |
| 8/14 | 8 | 2,153 | 6,368 | 231,679 | 216 | 3.0 | 10 |
| 8/15 | 10 | 2,468 | 7,439 | 239,118 | 371 | 3.0 | 7 |
| 8/16 | 9 | 1,811 | 5,326 | 244,444 | 285 | 2.9 | 6 |
| 8/17 | 11 | 1,369 | 4,002 | 248,446 | 326 | 2.9 | 4 |
| 8/18 | 3 | 1,146 | 3,422 | 251,868 | 160 | 3.0 | 7 |
| 8/19 | 3 | 451 | 1,317 | 253,185 | 80 | 2.9 | 6 |
| 8/20 | 7 | 1,130 | 3,365 | 256,550 | 252 | 3.0 | 4 |
| 8/21 | 11 | 1,317 | 3,896 | 260,446 | 372 | 3.0 | 4 |
| 8/22 | 3 | 331 | 997 | 261,443 | 120 | 3.0 | 3 |
| 8/23 | 1 | 4 | 13 | 261,456 | 40 | 3.3 | 0 |
| 8/24 | 3 | 616 | 2,076 | 263,532 | 88 | 3.4 | 7 |
| 8/25 | 9 | 1,069 | 3,244 | 266,776 | 243 | 3.0 | 4 |
| 8/27 | 3 | 396 | 1,170 | 267,946 | 69 | 3.0 | 6 |
| 8/28 | 10 | 2,359 | 7,181 | 275,127 | 351 | 3.0 | 7 |
| 8/29 | 5 | 1,403 | 4,223 | 279,350 | 135 | 3.0 | 10 |
| 8/30 | 2 | 915 | 2,784 | 282,134 | 78 | 3.0 | 12 |
| 8/31 | 5 | 2,798 | 8,568 | 290,702 | 189 | 3.1 | 15 |
| 9/04 | 8 | 3,899 | 12,228 | 302,930 | 270 | 3.1 | 14 |
| 9/05 | 3 | 1,777 | 5,237 | 308,167 | 71 | 2.9 | 25 |
| 9/06 | 6 | 2,617 | 7,694 | 315,861 | 200 | 2.9 | 13 |
| 9/07 | 8 | 2,851 | 8,430 | 324,291 | 237 | 3.0 | 12 |
| 9/08 | 4 | 1,485 | 4,440 | 328,731 | 131 | 3.0 | 11 |
| 9/09 | 6 | 2,195 | 6,817 | 335,548 | 204 | 3.1 | 11 |
| 9/10 | 12 | 2,920 | 8,826 | 344,374 | 314 | 3.0 | 9 |
| 9/11 | 5 | 1,368 | 4,065 | 348,439 | 155 | 3.0 | 9 |
| 9/12 | 1 | 123 | 367 | 348,806 | 12 | 3.0 | 10 |
| 9/13 | 6 | 2,854 | 8,660 | 357,466 | 177 | 3.0 | 16 |
| 9/14 | 3 | 1,747 | 5,386 | 362,852 | 91 | 3.1 | 19 |
| 9/15 | 8 | 3,436 | 10,426 | 373,278 | 212 | 3.0 | 16 |
| Total | 435 | 124,485 | 373,278 | 373,278 | 14,196 | 3.0 | 9 |

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Table 12.–Page 3 of 3.

| Date ^a | Landings | Number of crab | Crab harvested (lbs) | Cumulative total (lbs) | Number pots pulled | Average weight (lbs) | CPUE |
|-------------------|----------|----------------|----------------------|------------------------|--------------------|----------------------|------|
| CDQ | | | | | | | |
| 7/16 | 1 | 734 | 2,266 | 2,266 | 40 | 3.1 | 18 |
| 7/18 | 1 | 272 | 799 | 3,065 | 40 | 2.9 | 7 |
| 7/20 | 1 | 126 | 373 | 3,438 | 40 | 3.0 | 3 |
| 7/23 | 1 | 318 | 929 | 4,367 | 40 | 2.9 | 8 |
| 7/25 | 1 | 123 | 362 | 4,729 | 40 | 2.9 | 3 |
| 7/26 | 1 | 289 | 774 | 5,503 | 40 | 2.7 | 7 |
| 7/28 | 1 | 326 | 973 | 6,476 | 40 | 3.0 | 8 |
| 7/31 | 1 | 323 | 957 | 7,433 | 40 | 3.0 | 8 |
| 8/07 | 1 | 465 | 1,336 | 8,769 | 40 | 2.9 | 12 |
| 8/08 | 1 | 186 | 550 | 9,319 | 40 | 3.0 | 5 |
| 8/09 | 1 | 284 | 852 | 10,171 | 40 | 3.0 | 7 |
| 8/12 | 1 | 204 | 639 | 10,810 | 40 | 3.1 | 5 |
| 8/14 | 1 | 100 | 289 | 11,099 | 40 | 2.9 | 3 |
| 8/19 | 1 | 138 | 423 | 11,522 | 40 | 3.1 | 3 |
| 8/21 | 1 | 15 | 45 | 11,567 | 20 | 3.0 | 1 |
| 8/25 | 2 | 226 | 647 | 12,214 | 63 | 2.9 | 4 |
| 8/29 | 1 | 28 | 75 | 12,289 | 17 | 2.7 | 2 |
| 9/01 | 1 | 83 | 259 | 12,548 | 26 | 3.1 | 3 |
| 9/04 | 1 | 512 | 1,744 | 14,292 | 39 | 3.4 | 13 |
| 9/05 | 1 | 47 | 158 | 14,450 | 15 | 3.4 | 3 |
| 9/07 | 1 | 258 | 795 | 15,245 | 39 | 3.1 | 7 |
| 9/09 | 1 | 323 | 1,049 | 16,294 | 42 | 3.2 | 8 |
| 9/13 | 1 | 606 | 1,874 | 18,168 | 31 | 3.1 | 20 |
| 9/15 | 1 | 132 | 417 | 18,585 | 10 | 3.2 | 13 |
| Total | 25 | 6,118 | 18,585 | 18,585 | 862 | 3.0 | 7 |

Source: Fish ticket data.

^a Both the open access and CDQ (community development quota) fisheries closed by emergency order 9/14, and the last deliveries were made 9/15.

Table 13.—Commercial harvest of red king crab from Norton Sound Section by statistical area, Norton Sound District, 2013.

| Statistical Area | Number of crab ^a | Crab harvested (lbs.) | Number pots pulled | CPUE | Average weight (lbs) |
|------------------|-----------------------------|-----------------------|--------------------|------|----------------------|
| 616401 | 2,654 | 7,729 | 174 | 15 | 2.91 |
| 626331 | 230 | 686 | 58 | 4 | 2.98 |
| 626401 | 12,260 | 36,802 | 2,117 | 6 | 3.00 |
| 636330 | 4,129 | 12,035 | 492 | 8 | 2.91 |
| 636401 | 11,486 | 34,027 | 1,912 | 6 | 2.96 |
| 646330 | 1,446 | 4,195 | 173 | 8 | 2.90 |
| 646401 | 19,767 | 59,737 | 1,469 | 13 | 3.02 |
| 646402 | 1,803 | 5,271 | 148 | 12 | 2.92 |
| 656330 | 2,770 | 8,515 | 324 | 9 | 3.07 |
| 656401 | 49,031 | 147,569 | 5,696 | 9 | 3.01 |
| 656402 | 12,623 | 37,743 | 1,404 | 9 | 2.99 |
| 666401 | 10,938 | 33,469 | 918 | 12 | 3.06 |
| 666402 | 470 | 1,419 | 93 | 5 | 3.02 |
| 666431 | 996 | 2,669 | 80 | 12 | 2.68 |
| Total | 130,603 | 391,863 | 15,058 | 9 | 3.00 |

Note: Data for summer fishery only. CPUE is catch per unit of effort.

^a Includes 6,118 crab (18,585 lb) from the CDQ (community development quota) fishery.

APPENDIX A: NORTON SOUND FISHERIES

Appendix A1.–Commercial salmon catch by species, Norton Sound District, 1990–2013.

| Year | Chinook | Sockeye | Coho | Pink | Chum | Total |
|-------------------|---------|---------|---------|---------|---------|-----------|
| 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 | 21 | 17,060 | 0 | 3,560 | 20,653 |
| 2004 ^a | 22 | 47 | 42,016 | 0 | 6,296 | 48,381 |
| 2005 | 151 | 12 | 85,523 | 0 | 3,983 | 89,669 |
| 2006 | 20 | 3 | 130,808 | 0 | 10,042 | 140,873 |
| 2007 | 19 | 2 | 126,136 | 3,769 | 22,431 | 152,357 |
| 2008 | 83 | 60 | 120,309 | 75,525 | 25,124 | 221,101 |
| 2009 ^a | 84 | 126 | 87,041 | 17,364 | 34,122 | 138,737 |
| 2010 | 140 | 103 | 62,079 | 31,557 | 117,743 | 211,622 |
| 2011 | 185 | 369 | 58,917 | 7,141 | 110,555 | 177,167 |
| 2012 ^a | 197 | 134 | 37,056 | 205,498 | 62,772 | 305,657 |
| 2013 | 151 | 247 | 53,802 | 8,338 | 118,709 | 181,247 |
| Avg 2008–2012 | 138 | 158 | 73,080 | 67,417 | 70,063 | 210,857 |
| Avg 2003–2012 | 91 | 88 | 76,695 | 34,085 | 39,663 | 150,622 |

Note: Harvest numbers may include a small number of salmon reported on fish tickets that were retained for personal use and not commercially sold.

^a All Chinook salmon caught were retained for personal use and not sold.

Appendix A2.–Number of commercial salmon permits fished, Norton Sound, 1990–2013.

| Year | Subdistrict | | | | | | District Total ^a |
|---------------|-------------|----|----|----|----|----|-----------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| 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 |
| 2005 | 0 | 0 | 0 | 0 | 12 | 28 | 40 |
| 2006 | 0 | 0 | 0 | 0 | 22 | 40 | 61 |
| 2007 | 0 | 0 | 11 | 0 | 15 | 47 | 71 |
| 2008 | 0 | 4 | 12 | 4 | 23 | 58 | 91 |
| 2009 | 0 | 5 | 17 | 7 | 21 | 49 | 88 |
| 2010 | 0 | 10 | 19 | 5 | 35 | 59 | 115 |
| 2011 | 0 | 13 | 32 | 12 | 30 | 65 | 123 |
| 2012 | 0 | 14 | 24 | 18 | 21 | 55 | 123 |
| 2013 | 1 | 14 | 21 | 18 | 24 | 57 | 124 |
| Avg 2008–2012 | 0 | 9 | 21 | 9 | 26 | 57 | 108 |
| Avg 2003–2012 | 0 | 5 | 12 | 5 | 20 | 45 | 78 |

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

Appendix A3.—Round weight and value of commercially caught salmon by species, Norton Sound District, 1990–2013.

| Year | Pounds caught (Round wt. in lbs) | | | | Salmon roe (lbs) | Value of catch (\$) |
|------|----------------------------------|-----------|--------------|---------|------------------|---------------------|
| | Chinook | Coho | Pink | Chum | | |
| 1990 | 168,745 | 426,902 | ^a | 482,060 | 75 | 474,064 |
| 1991 | 107,541 | 469,495 | ^a | 597,272 | 221 | 413,479 |
| 1992 | 57,571 | 820,406 | 18,230 | 595,345 | 2,641 | 448,395 |
| 1993 | 151,504 | 287,702 | 406,820 | 347,072 | 2,608 | 368,723 |
| 1994 | 98,492 | 766,050 | 2,185,066 | 122,540 | 0 | 863,060 |
| 1995 | 174,771 | 356,190 | 198,121 | 290,445 | 0 | 356,164 |
| 1996 | 95,794 | 573,372 | 1,196,115 | 84,349 | 0 | 340,347 |
| 1997 | 225,136 | 235,517 | 50 | 253,006 | 880 | 363,908 |
| 1998 | 127,831 | 232,705 | 1,330,624 | 106,687 | 0 | 358,982 |
| 1999 | 48,421 | 88,037 | 0 | 57,656 | 0 | 76,860 |
| 2000 | 11,240 | 307,565 | 369,800 | 40,298 | 0 | 149,907 |
| 2001 | 3,803 | 152,293 | 0 | 79,558 | 0 | 56,921 |
| 2002 | 50 | 12,972 | 0 | 4,555 | 0 | 2,941 |
| 2003 | 136 | 139,775 | 0 | 23,687 | 0 | 64,473 |
| 2004 | 0 | 302,379 | 0 | 42,385 | 0 | 122,506 |
| 2005 | 2,511 | 659,278 | 0 | 28,071 | 0 | 296,154 |
| 2006 | 167 | 869,427 | 0 | 68,500 | 0 | 389,707 |
| 2007 | 206 | 1,002,078 | 10,537 | 151,386 | 0 | 572,195 |
| 2008 | 970 | 855,980 | 187,979 | 171,151 | 0 | 759,451 |
| 2009 | 0 | 679,416 | 46,698 | 240,502 | 0 | 722,167 |
| 2010 | 1,697 | 472,939 | 87,954 | 799,550 | 0 | 1,220,487 |
| 2011 | 1,659 | 438,481 | 19,768 | 774,906 | 0 | 1,269,730 |
| 2012 | 0 | 245,078 | 492,372 | 425,233 | 0 | 758,908 |
| 2013 | 0 | 410,791 | 24,201 | 823,453 | 0 | 1,183,236 |

^a Information not available.

Appendix A4.—Estimated mean prices paid to commercial salmon fishermen in dollars, Norton Sound District, 1990–2013.

| Year | Chinook | Coho | Pink | Chum | Sockeye |
|---------------|---------|---------------------|----------------|---------------------|---------|
| 1990 | 1.01 | 0.50 | (0.75 for roe) | 0.23 | |
| 1991 | 0.87 | 0.36 (3.00 for roe) | | 0.27 (3.00 for roe) | |
| 1992 | 0.66 | 0.33 (1.50 for roe) | 0.16 | 0.22 | |
| 1993 | 0.72 | 0.22 (1.76 for roe) | 0.15 | 0.24 | 0.40 |
| 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 | 1.00 | 0.25 | | 0.19 | 0.37 |
| 2002 | 0.39 | 0.20 | | 0.07 | |
| 2003 | 0.64 | 0.44 | | 0.14 | 0.45 |
| 2004 | | 0.39 | | 0.14 | |
| 2005 | 1.22 | 0.44 | | 0.15 | 0.45 |
| 2006 | 1.49 | 0.44 | | 0.14 | |
| 2007 | 0.55 | 0.53 | 0.14 | 0.24 | 0.55 |
| 2008 | 0.73 | 0.77 | 0.23 | 0.34 | 0.56 |
| 2009 | | 0.93 | 0.18 | 0.33 | 0.34 |
| 2010 | 2.25 | 1.47 | 0.32 | 0.62 | 0.63 |
| 2011 | 3.01 | 1.70 | 0.25 | 0.68 | 1.04 |
| 2012 | | 1.47 | 0.36 | 0.52 | 1.45 |
| 2013 | | 1.77 | 0.22 | 0.55 | 1.49 |
| Avg 2008–2012 | 1.50 | 1.59 | 0.34 | 0.62 | 1.01 |

Note: Blank cells indicate no known purchases were made.

Appendix A5.—Mean commercial salmon harvest weights, Norton Sound District, 1990–2013.

| Year | Mean round weight in pounds ^a | | | |
|-------------------|--|------|--------------|------|
| | Chinook | Coho | Pink | Chum |
| 1990 | 19.0 | 7.5 | NA | 7.4 |
| 1991 | 17.7 | 7.4 | ^c | 6.9 |
| 1992 ^b | 12.7 | 7.8 | 2.9 | 7.1 |
| 1993 | 16.9 | 6.6 | 2.6 | 6.5 |
| 1994 | 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 | ^c | 7.3 |
| 2000 | 14.9 | 6.9 | 2.2 | 6.5 |
| 2001 | 17.8 | 7.8 | ^c | 7.2 |
| 2002 ^b | 10.0 | 7.4 | ^c | 7.6 |
| 2003 ^b | 11.3 | 8.2 | ^c | 6.7 |
| 2004 | ^c | 7.2 | ^c | 6.7 |
| 2005 | 16.6 | 7.7 | ^c | 7.0 |
| 2006 ^b | 14.4 | 6.6 | ^c | 6.8 |
| 2007 ^b | 10.8 | 7.9 | 2.8 | 6.7 |
| 2008 ^b | 14.7 | 7.1 | 2.5 | 6.8 |
| 2009 | ^c | 7.8 | 2.7 | 7.0 |
| 2010 | 14.4 | 7.6 | 2.8 | 6.8 |
| 2011 | 11.4 | 7.3 | 2.8 | 7.0 |
| 2012 | ^c | 6.6 | 2.4 | 6.8 |
| 2013 | ^c | 7.6 | 2.9 | 6.9 |

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

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

^c None sold.

Appendix A6.–Commercial and subsistence salmon catch by species, by year in Nome Subdistrict, Norton Sound District, 1990–2013.

| Year | NOME (SUBDISTRICT 1) | | | | | | | | | | | | | | | | | |
|--------------------------|----------------------|--------------|--------------|--------------|--------------|--------------|-------------|---------|-------|--------|-------|--------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Commercial | | | | | | Subsistence | | | | | | Combined | | | | | |
| | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total |
| 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 | 26 | 148 | 1,365 | 336 | 3,794 | 5,669 | 26 | 149 | 1,734 | 336 | 3,916 | 6,161 |
| 1996 | 0 | 0 | 9 | 13 | 3 | 25 | 9 | 185 | 828 | 3,510 | 2,287 | 6,819 | 9 | 185 | 837 | 3,523 | 2,290 | 6,844 |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 50 | 325 | 175 | 2,696 | 3,256 | 10 | 50 | 325 | 175 | 2,696 | 3,256 |
| 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 ^a | 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 | 1,114 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 106 | 1,574 | 15,047 | 685 | 17,512 | 100 | 106 | 1,574 | 15,047 | 685 | 17,512 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 62 | 177 | 1,287 | 5,075 | 803 | 7,404 | 62 | 177 | 1,287 | 5,075 | 803 | 7,404 |
| 2006 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 159 | 3,865 | 9,329 | 890 | 14,267 | 24 | 159 | 3,865 | 9,329 | 890 | 14,267 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 297 | 1,103 | 850 | 2,938 | 5,206 | 18 | 297 | 1,103 | 850 | 2,938 | 5,206 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 127 | 3,423 | 12,592 | 739 | 16,920 | 39 | 127 | 3,423 | 12,592 | 739 | 16,920 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 64 | 1,132 | 487 | 387 | 2,102 | 32 | 64 | 1,132 | 487 | 387 | 2,102 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 77 | 1,983 | 6,281 | 3,124 | 11,504 | 39 | 77 | 1,983 | 6,281 | 3,124 | 11,504 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 47 | 1,229 | 1,389 | 1,428 | 4,112 | 19 | 47 | 1,229 | 1,389 | 1,428 | 4,112 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 171 | 1,150 | 8,376 | 2,521 | 12,229 | 11 | 171 | 1,150 | 8,376 | 2,521 | 12,229 |
| 2013 | ^c | ^c | ^c | ^c | ^c | ^c | 48 | 211 | 1,804 | 805 | 3,065 | 5,973 | ^c | ^c | ^c | ^c | ^c | ^c |
| 5-year avg ^d | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 97 | 1,783 | 5,825 | 1,640 | 9,373 | 28 | 97 | 1,783 | 5,825 | 1,640 | 9,373 |
| 10-year avg ^e | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 130 | 1,710 | 5,993 | 1,408 | 9,282 | 41 | 130 | 1,710 | 5,993 | 1,408 | 9,282 |

Note: Commercial harvest numbers may include a small number of salmon reported on fish tickets that were retained for personal use and not commercially sold.

^a Beginning in 1999, Tier II chum salmon fishing restrictions limited the number of permit holders that could fish for chum salmon.

^b Beginning in 2006, Tier II chum salmon fishing restrictions were suspended.

^c Confidential.

^d 2008–2012.

^e 2003–2012.

Appendix A7.–Commercial and subsistence salmon catch by species, by year in Golovin Subdistrict, Norton Sound District, 1990–2013.

| Year | GOLOVIN (SUBDISTRICT 2) | | | | | | | | | | | | | | | | | | |
|-----------------------------|-------------------------|---------|-------|---------|--------|---------|-------------|---------|-------|--------|--------|--------|----------|---------|-------|---------|--------|---------|--|
| | Commercial | | | | | | Subsistence | | | | | | Combined | | | | | | |
| | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total | |
| 1990 | 52 | 21 | 0 | 0 | 15,993 | 16,066 | a | a | a | a | a | a | a | a | a | a | a | a | |
| 1991 | 49 | 1 | 0 | 0 | 14,839 | 14,889 | a | a | a | a | a | a | a | a | a | a | a | a | |
| 1992 | 6 | 9 | 2,085 | 0 | 1,002 | 3,102 | a | a | a | a | a | a | a | a | a | a | a | a | |
| 1993 | 1 | 4 | 2 | 8,480 | 2,803 | 11,290 | a | a | a | a | a | a | a | a | a | a | a | a | |
| 1994 ^b | 0 | 0 | 3,424 | 0 | 111 | 3,535 | 253 | 168 | 733 | 8,410 | 1,337 | 10,901 | 253 | 168 | 4,157 | 8,410 | 1,448 | 14,436 | |
| 1995 ^b | 0 | 0 | 1,616 | 4,296 | 1,987 | 7,899 | 165 | 34 | 1,649 | 7,818 | 10,373 | 20,039 | 165 | 34 | 3,265 | 12,114 | 12,360 | 27,938 | |
| 1996 ^b | 0 | 0 | 638 | 0 | 0 | 638 | 86 | 134 | 3,014 | 17,399 | 2,867 | 23,500 | 86 | 134 | 3,652 | 17,399 | 2,867 | 24,138 | |
| 1997 ^b | 19 | 2 | 102 | 20 | 8,003 | 8,146 | 138 | 427 | 555 | 4,570 | 4,891 | 10,581 | 157 | 429 | 657 | 4,590 | 12,894 | 18,727 | |
| 1998 ^b | 1 | 0 | 3 | 106,761 | 723 | 107,488 | 184 | 37 | 1,292 | 13,340 | 1,893 | 16,746 | 185 | 37 | 1,295 | 120,101 | 2,616 | 124,234 | |
| 1999 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 48 | 1,234 | 469 | 3,656 | 5,467 | 60 | 48 | 1,234 | 469 | 3,656 | 5,467 | |
| 2000 ^b | 0 | 0 | 1,645 | 17,408 | 164 | 19,217 | 169 | 18 | 2,335 | 10,906 | 1,155 | 14,583 | 169 | 18 | 3,980 | 28,314 | 1,319 | 33,800 | |
| 2001 ^b | 0 | 43 | 30 | 0 | 7,094 | 7,167 | 89 | 72 | 880 | 1,665 | 3,291 | 5,997 | 89 | 115 | 910 | 1,665 | 10,385 | 13,164 | |
| 2002 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 66 | 1,640 | 14,430 | 1,882 | 18,087 | 69 | 66 | 1,640 | 14,430 | 1,882 | 18,087 | |
| 2003 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 166 | 28 | 309 | 5,012 | 1,477 | 6,992 | 166 | 28 | 309 | 5,012 | 1,477 | 6,992 | |
| 2004 ^c | 0 | 0 | 0 | 0 | 0 | 0 | 164 | 6 | 654 | 19,936 | 880 | 21,640 | 164 | 6 | 654 | 19,936 | 880 | 21,640 | |
| 2005 ^c | 0 | 0 | 0 | 0 | 0 | 0 | 96 | 15 | 686 | 11,467 | 1,852 | 14,116 | 96 | 15 | 686 | 11,467 | 1,852 | 14,116 | |
| 2006 ^c | 0 | 0 | 0 | 0 | 0 | 0 | 136 | 38 | 1,760 | 14,670 | 722 | 17,326 | 136 | 38 | 1,760 | 14,670 | 722 | 17,326 | |
| 2007 ^c | 0 | 0 | 0 | 0 | 0 | 0 | 188 | 321 | 1,179 | 3,980 | 4,217 | 9,885 | 188 | 321 | 1,179 | 3,980 | 4,217 | 9,885 | |
| 2008 ^c | 0 | 0 | 256 | 2,699 | 623 | 3,578 | 146 | 95 | 2,337 | 10,155 | 350 | 13,083 | 146 | 95 | 2,593 | 12,854 | 973 | 16,661 | |
| 2009 ^c | 0 | 0 | 2,452 | 0 | 87 | 2,539 | 237 | 33 | 1,377 | 3,787 | 1,694 | 7,128 | 237 | 33 | 3,829 | 3,787 | 1,781 | 9,667 | |
| 2010 ^c | 3 | 2 | 5,586 | 2,039 | 17,212 | 24,842 | 59 | 32 | 2,020 | 9,620 | 1,133 | 12,864 | 62 | 34 | 7,606 | 11,659 | 18,345 | 37,706 | |
| 2011 ^c | 7 | 0 | 859 | 3 | 20,075 | 20,944 | 99 | 74 | 1,345 | 5,652 | 2,122 | 9,292 | 106 | 74 | 2,204 | 5,655 | 22,197 | 30,236 | |
| 2012 ^c | 2 | 14 | 573 | 31,055 | 3,791 | 35,435 | 57 | 52 | 1,143 | 7,635 | 1,056 | 9,943 | 59 | 66 | 1,716 | 38,690 | 4,847 | 45,378 | |
| 2013 ^c | 0 | 0 | 5,362 | 1,180 | 3,113 | 9,655 | 47 | 15 | 964 | 3,655 | 3,256 | 7,937 | 47 | 15 | 6,326 | 4,835 | 6,369 | 17,592 | |
| 5-year avg ^d | 2 | 3 | 1,945 | 7,159 | 8,358 | 17,468 | 120 | 57 | 1,644 | 7,370 | 1,271 | 10,462 | 122 | 60 | 3,590 | 14,529 | 9,629 | 27,930 | |
| 10-year avg ^e | 1 | 2 | 973 | 3,580 | 4,179 | 8,734 | 135 | 69 | 1,281 | 9,191 | 1,550 | 12,227 | 136 | 71 | 2,254 | 12,771 | 5,729 | 20,961 | |

Note: Commercial harvest numbers may include a small number of salmon reported on fish tickets that were retained for personal use and not commercially sold.

^a Subsistence surveys were not conducted.

^b Subsistence harvests were estimated from Division of Subsistence household surveys. Previous surveys often were partial surveys and did not capture late-season harvests like coho salmon.

^c Beginning in 2004 a permit was required for the subdistrict, replacing household surveys. The permit system helped to record harvest by residents living outside the subdistrict.

^d 2008–2012.

^e 2003–2012.

Appendix A8.–Commercial and subsistence salmon catch by species, by year in Elim Subdistrict, Norton Sound District, 1990–2013.

| Year | ELIM (SUBDISTRICT 3) | | | | | | | | | | | | | | | | | |
|------------------------------|----------------------|---------|--------|---------|--------|---------|-------------|---------|-------|--------|-------|--------|----------|---------|--------|---------|--------|---------|
| | Commercial | | | | | | Subsistence | | | | | | Combined | | | | | |
| | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total |
| 1990 | 202 | 0 | 0 | 501 | 3,723 | 4,426 | | | | | | | | | | | | |
| 1991 ^b | 161 | 0 | 0 | 0 | 804 | 965 | 312 | 0 | 2,153 | 3,555 | 2,660 | 8,680 | 473 | 0 | 2,153 | 3,555 | 3,464 | 9,645 |
| 1992 ^b | 0 | 0 | 3,531 | 0 | 6 | 3,537 | 100 | 0 | 1,281 | 6,152 | 1,260 | 8,793 | 100 | 0 | 4,812 | 6,152 | 1,266 | 12,330 |
| 1993 ^b | 3 | 0 | 4,065 | 0 | 167 | 4,235 | 368 | 0 | 1,217 | 1,726 | 1,635 | 4,946 | 371 | 0 | 5,282 | 1,726 | 1,802 | 9,181 |
| 1994 ^b | 0 | 0 | 5,345 | 0 | 414 | 5,759 | 322 | 104 | 1,180 | 9,345 | 3,476 | 14,427 | 322 | 104 | 6,525 | 9,345 | 3,890 | 20,186 |
| 1995 ^b | 4 | 44 | 3,742 | 2,962 | 1,171 | 7,923 | 284 | 17 | 1,353 | 2,046 | 3,774 | 7,474 | 288 | 61 | 5,095 | 5,008 | 4,945 | 15,397 |
| 1996 ^b | 0 | 0 | 1,915 | 68,609 | 0 | 70,524 | 417 | 52 | 1,720 | 9,442 | 2,319 | 13,950 | 417 | 52 | 3,635 | 78,051 | 2,319 | 84,474 |
| 1997 ^b | 844 | 0 | 1,409 | 0 | 2,683 | 4,936 | 619 | 50 | 1,213 | 1,314 | 2,064 | 5,260 | 1,463 | 50 | 2,622 | 1,314 | 4,747 | 10,196 |
| 1998 ^b | 105 | 0 | 1,462 | 145,669 | 2,311 | 149,547 | 414 | 49 | 1,831 | 6,891 | 1,376 | 10,561 | 519 | 49 | 3,293 | 152,560 | 3,687 | 160,108 |
| 1999 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 424 | 13 | 975 | 1,564 | 744 | 3,720 | 424 | 13 | 975 | 1,564 | 744 | 3,720 |
| 2000 ^b | 10 | 0 | 5,182 | 46,369 | 535 | 52,096 | 248 | 46 | 1,429 | 5,983 | 1,173 | 8,879 | 258 | 46 | 6,611 | 52,352 | 1,708 | 60,975 |
| 2001 ^b | 7 | 0 | 1,696 | 0 | 681 | 2,384 | 427 | 70 | 1,352 | 1,390 | 898 | 4,137 | 434 | 70 | 3,048 | 1,390 | 1,579 | 6,521 |
| 2002 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 565 | 14 | 1,801 | 8,345 | 1,451 | 12,176 | 565 | 14 | 1,801 | 8,345 | 1,451 | 12,176 |
| 2003 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 660 | 39 | 1,143 | 2,524 | 1,687 | 6,053 | 660 | 39 | 1,143 | 2,524 | 1,687 | 6,053 |
| 2004 ^c | 0 | 0 | 0 | 0 | 0 | 0 | 412 | 0 | 704 | 7,858 | 683 | 9,657 | 412 | 0 | 704 | 7,858 | 683 | 9,657 |
| 2005 ^c | 0 | 0 | 0 | 0 | 0 | 0 | 225 | 9 | 1,011 | 3,721 | 598 | 5,564 | 225 | 9 | 1,011 | 3,721 | 598 | 5,564 |
| 2006 ^c | 0 | 0 | 0 | 0 | 0 | 0 | 179 | 13 | 1,769 | 5,216 | 1,267 | 8,444 | 179 | 13 | 1,769 | 5,216 | 1,267 | 8,444 |
| 2007 ^c | 1 | 0 | 5,908 | 1,648 | 4,567 | 12,124 | 260 | 0 | 2,295 | 1,742 | 2,334 | 6,631 | 261 | 0 | 8,203 | 3,390 | 6,901 | 18,755 |
| 2008 ^c | 5 | 0 | 4,602 | 14,536 | 304 | 19,447 | 269 | 0 | 1,804 | 7,655 | 1,284 | 11,012 | 274 | 0 | 6,406 | 22,191 | 1,588 | 30,459 |
| 2009 ^c | 0 | 1 | 9,582 | 35 | 597 | 10,215 | 545 | 13 | 2,434 | 1,522 | 600 | 5,114 | 545 | 14 | 12,016 | 1,557 | 1,197 | 15,329 |
| 2010 ^c | 9 | 5 | 10,180 | 11,658 | 23,453 | 45,305 | 97 | 7 | 1,679 | 7,830 | 3,925 | 13,538 | 106 | 12 | 11,859 | 19,488 | 27,378 | 58,843 |
| 2011 ^c | 4 | 12 | 8,336 | 165 | 23,531 | 32,048 | 160 | 3 | 1,688 | 704 | 3,671 | 6,226 | 164 | 15 | 10,024 | 869 | 27,202 | 38,274 |
| 2012 ^c | 3 | 1 | 2,003 | 52,775 | 2,262 | 57,044 | 42 | 0 | 1,302 | 10,848 | 1,494 | 13,686 | 45 | 1 | 3,305 | 63,623 | 3,756 | 70,730 |
| 2013 ^c | 6 | 27 | 6,675 | 601 | 1,434 | 8,743 | 39 | 15 | 1,515 | 1,134 | 1,218 | 3,921 | 45 | 42 | 8,190 | 1,735 | 2,652 | 12,664 |
| 5-year avg. ^d | 4 | 4 | 6,941 | 15,834 | 10,029 | 32,812 | 223 | 5 | 1,781 | 5,712 | 2,195 | 9,915 | 227 | 8 | 8,722 | 21,546 | 12,224 | 42,727 |
| 10-year avg. ^e | 2 | 2 | 4,061 | 8,082 | 5,471 | 17,618 | 285 | 8 | 1,583 | 4,962 | 1,754 | 8,593 | 287 | 10 | 5,644 | 13,044 | 7,226 | 26,211 |

Note: Commercial harvest numbers may include a small number of salmon reported on fish tickets that were retained for personal use and not commercially sold.

^a Subsistence surveys were not conducted.

^b Subsistence harvests were estimated from Division of Subsistence household surveys. Previous surveys often were partial surveys and did not capture later season harvest like coho salmon.

^c Beginning in 2004 a permit was required for the subdistrict, replacing household surveys. The permit system helped to record harvest by residents living outside the subdistrict.

^d 2008–2012.

^e 2003–2012.

Appendix A9.–Commercial and subsistence salmon catch by species, by year in Norton Bay Subdistrict, Norton Sound District, 1990–2013.

| Year | NORTON BAY (SUBDISTRICT 4) | | | | | | | | | | | | | | | | | |
|--------------------------|----------------------------|---------|-------|--------|--------|--------|-------------|---------|-------|-------|-------|--------|----------|---------|-------|--------|--------|--------|
| | Commercial | | | | | | Subsistence | | | | | | Combined | | | | | |
| | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1991 | 0 | 0 | 0 | 0 | 0 | 0 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1992 | 27 | 0 | 0 | 0 | 1,787 | 1,814 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1993 | 267 | 0 | 0 | 290 | 1,378 | 1,935 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1994 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 308 | 1 | 370 | 6,049 | 4,581 | 11,309 | 308 | 1 | 370 | 6,049 | 4,581 | 11,309 |
| 1995 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 475 | 46 | 985 | 3,514 | 5,828 | 10,848 | 475 | 46 | 985 | 3,514 | 5,828 | 10,848 |
| 1996 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 295 | 3 | 676 | 3,929 | 4,161 | 9,064 | 295 | 3 | 676 | 3,929 | 4,161 | 9,064 |
| 1997 ^b | 194 | 0 | 0 | 0 | 531 | 725 | 656 | 54 | 322 | 1,795 | 4,040 | 6,867 | 850 | 54 | 322 | 1,795 | 4,571 | 7,592 |
| 1998 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 684 | 0 | 388 | 2,009 | 6,192 | 9,273 | 684 | 0 | 388 | 2,009 | 6,192 | 9,273 |
| 1999 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 327 | 0 | 167 | 1,943 | 4,153 | 6,590 | 327 | 0 | 167 | 1,943 | 4,153 | 6,590 |
| 2000 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 397 | 2 | 267 | 2,255 | 4,714 | 7,635 | 397 | 2 | 267 | 2,255 | 4,714 | 7,635 |
| 2001 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 460 | 14 | 276 | 5,203 | 4,445 | 10,398 | 460 | 14 | 276 | 5,203 | 4,445 | 10,398 |
| 2002 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 557 | 0 | 509 | 6,049 | 3,971 | 11,086 | 557 | 0 | 509 | 6,049 | 3,971 | 11,086 |
| 2003 ^b | 0 | 0 | 0 | 0 | 0 | 0 | 373 | 46 | 510 | 4,184 | 3,397 | 8,510 | 373 | 46 | 510 | 4,184 | 3,397 | 8,510 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | a | a | a | a | a | a | a | a | a | a | a | a |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | a | a | a | a | a | a | a | a | a | a | a | a |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | a | a | a | a | a | a | a | a | a | a | a | a |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | a | a | a | a | a | a | a | a | a | a | a | a |
| 2008 | 7 | 0 | 600 | 1,232 | 507 | 2,346 | 187 | 2 | 1,084 | 4,489 | 3,330 | 9,092 | 194 | 2 | 1,684 | 5,721 | 3,837 | 11,438 |
| 2009 | 0 | 0 | 1,714 | 558 | 1,850 | 4,122 | 259 | 2 | 891 | 2,508 | 3,183 | 6,843 | 259 | 2 | 2,605 | 3,066 | 5,033 | 10,965 |
| 2010 | 0 | 7 | 1,606 | 2,597 | 6,007 | 10,217 | 341 | 21 | 461 | 3,115 | 3,180 | 7,118 | 341 | 28 | 2,067 | 5,712 | 9,187 | 17,335 |
| 2011 | 5 | 9 | 4,836 | 652 | 7,558 | 13,060 | 239 | 1 | 549 | 1,132 | 3,529 | 5,450 | 6 | 558 | 5,968 | 4,181 | 13,008 | 13,066 |
| 2012 | 10 | 16 | 4,378 | 49,970 | 8,417 | 62,791 | 103 | 0 | 310 | 2,623 | 2,721 | 5,757 | 113 | 16 | 4,688 | 52,593 | 11,138 | 68,548 |
| 2013 | 8 | 4 | 5,485 | 487 | 36,021 | 42,005 | 123 | 2 | 826 | 1,341 | 3,853 | 6,145 | 131 | 6 | 6,311 | 1,828 | 39,874 | 48,150 |
| 5-year avg. ^c | 6 | 8 | 3,284 | 13,752 | 6,085 | 23,134 | 282 | 7 | 824 | 3,467 | 3,986 | 8,565 | 228 | 152 | 4,253 | 17,818 | 10,551 | 30,338 |

Note: Commercial harvest numbers may include a small number of salmon reported on fish tickets that were retained for personal use and not commercially sold.

^a Subsistence surveys were not conducted.

^b Subsistence harvests were estimated from Division of Subsistence household surveys. Previous surveys often were partial surveys that did not capture later season harvests like coho salmon.

^c 2008–2012.

Appendix A10.–Commercial and subsistence salmon catch by species, by year in Shaktoolik Subdistrict, Norton Sound District, 1990–2013.

| Year | SHAKTOOLIK (SUBDISTRICT 5) | | | | | | | | | | | | | | | | | |
|------------------------------|----------------------------|---------|--------|---------|--------|---------|-------------|---------|-------|--------|-------|--------|----------|---------|--------|---------|--------|---------|
| | Commercial | | | | | | Subsistence | | | | | | Combined | | | | | |
| | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total |
| 1990 | 2,644 | 49 | 4,695 | 0 | 21,748 | 29,136 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1991 | 1,324 | 55 | 11,614 | 0 | 31,619 | 44,612 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1992 | 1,098 | 56 | 14,660 | 0 | 27,867 | 43,681 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1993 | 2,756 | 20 | 11,130 | 106,743 | 20,864 | 141,513 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1994 ^b | 885 | 8 | 22,065 | 502,231 | 5,411 | 530,600 | 1,175 | 1 | 2,777 | 9,133 | 1,221 | 14,307 | 2,060 | 9 | 24,842 | 511,364 | 6,632 | 544,907 |
| 1995 ^b | 1,239 | 5 | 10,856 | 37,377 | 14,775 | 64,252 | 1,303 | 72 | 2,682 | 7,176 | 2,534 | 15,885 | 2,542 | 77 | 13,538 | 44,553 | 17,309 | 80,137 |
| 1996 ^b | 1,340 | 1 | 13,444 | 304,982 | 3,237 | 323,004 | 1,114 | 31 | 3,615 | 8,370 | 4,425 | 17,555 | 2,454 | 32 | 17,059 | 313,352 | 7,662 | 340,559 |
| 1997 ^b | 2,449 | 0 | 4,694 | 0 | 5,747 | 12,890 | 1,146 | 62 | 2,761 | 5,779 | 1,612 | 11,360 | 3,595 | 62 | 7,455 | 5,779 | 7,359 | 24,250 |
| 1998 ^b | 910 | 0 | 3,624 | 236,171 | 7,080 | 247,785 | 982 | 92 | 1,872 | 6,270 | 1,034 | 10,250 | 1,892 | 92 | 5,496 | 242,441 | 8,114 | 258,035 |
| 1999 ^b | 581 | 0 | 2,398 | 0 | 2,181 | 5,160 | 818 | 183 | 1,556 | 5,092 | 467 | 8,116 | 1,399 | 183 | 3,954 | 5,092 | 2,648 | 13,276 |
| 2000 ^b | 160 | 3 | 7,779 | 85,493 | 2,751 | 96,186 | 440 | 20 | 2,799 | 5,432 | 2,412 | 11,103 | 600 | 23 | 10,578 | 90,925 | 5,163 | 107,289 |
| 2001 ^b | 90 | 0 | 2,664 | 0 | 1,813 | 4,567 | 936 | 143 | 2,090 | 10,172 | 1,553 | 14,894 | 1,026 | 143 | 4,754 | 10,172 | 3,366 | 19,461 |
| 2002 ^b | 1 | 0 | 680 | 0 | 261 | 942 | 1,230 | 4 | 2,169 | 8,769 | 800 | 12,972 | 1,231 | 4 | 2,849 | 8,769 | 1,061 | 13,914 |
| 2003 ^b | 2 | 0 | 4,031 | 0 | 485 | 4,518 | 881 | 50 | 2,941 | 12,332 | 587 | 16,791 | 883 | 50 | 6,972 | 12,332 | 1,072 | 21,309 |
| 2004 | 0 | 0 | 12,734 | 0 | 1,372 | 14,106 | 943 | 12 | 1,994 | 7,291 | 139 | 10,379 | 943 | 12 | 14,728 | 7,291 | 1,511 | 24,485 |
| 2005 | 50 | 0 | 21,818 | 0 | 791 | 22,659 | 807 | 0 | 1,913 | 12,075 | 202 | 14,997 | 857 | 0 | 23,731 | 12,075 | 993 | 37,656 |
| 2006 | 8 | 0 | 32,472 | 0 | 3,321 | 35,801 | 382 | 36 | 1,968 | 4,817 | 351 | 7,554 | 390 | 36 | 34,440 | 4,817 | 3,672 | 43,355 |
| 2007 | 5 | 0 | 31,810 | 0 | 6,076 | 37,891 | 515 | 28 | 1,443 | 2,708 | 465 | 5,159 | 520 | 28 | 33,253 | 2,708 | 6,541 | 43,050 |
| 2008 | 6 | 24 | 37,624 | 8,219 | 6,042 | 51,915 | 422 | 2 | 1,504 | 4,920 | 201 | 7,049 | 428 | 26 | 39,128 | 13,139 | 6,243 | 58,964 |
| 2009 | 4 | 36 | 13,063 | 5,146 | 10,941 | 29,190 | 417 | 57 | 2,141 | 6,101 | 374 | 9,090 | 421 | 93 | 15,204 | 11,247 | 11,315 | 38,280 |
| 2010 | 4 | 18 | 11,868 | 4,622 | 40,483 | 56,995 | 327 | 115 | 1,940 | 6,406 | 1,680 | 10,468 | 331 | 133 | 13,808 | 11,028 | 42,163 | 67,463 |
| 2011 | 45 | 69 | 15,368 | 29 | 25,388 | 40,899 | 235 | 100 | 1,241 | 2,681 | 490 | 4,747 | 280 | 169 | 16,609 | 2,710 | 25,878 | 45,646 |
| 2012 | 25 | 29 | 7,828 | 19,253 | 20,141 | 47,276 | 214 | 9 | 1,110 | 4,609 | 634 | 6,576 | 239 | 38 | 8,938 | 23,862 | 20,775 | 53,852 |
| 2013 | 6 | 45 | 6,890 | 14 | 23,268 | 30,223 | 136 | 108 | 2,146 | 3,346 | 983 | 6,719 | 142 | 153 | 9,036 | 3,360 | 24,251 | 36,942 |
| 5-year avg. ^c | 17 | 35 | 17,150 | 7,454 | 20,599 | 45,255 | 323 | 57 | 1,587 | 4,943 | 676 | 7,586 | 340 | 92 | 18,737 | 12,397 | 21,275 | 52,841 |
| 10-year avg. ^d | 15 | 18 | 18,862 | 3,727 | 11,504 | 34,125 | 514 | 41 | 1,820 | 6,394 | 512 | 9,281 | 529 | 59 | 20,681 | 10,121 | 12,016 | 43,406 |

Note: Commercial harvest numbers may include a small number of salmon reported on fish tickets that were retained for personal use and not commercially sold.

^a Subsistence surveys were not conducted.

^b Subsistence harvests were estimated from Division of Subsistence household surveys. Previous surveys often were partial surveys that did not capture later season harvests by fishermen.

^c 2008–2012.

^d 2003–2012.

Appendix A11.—Commercial and subsistence salmon catch by species, by year in Unalakleet Subdistrict, Norton Sound District, 1990–2013.

| Year | UNALAKLEET (SUBDISTRICT 6) | | | | | | | | | | | | | | | | | |
|---------------------------|----------------------------|---------|--------|---------|--------|---------|-------------|---------|--------|--------|-------|--------|----------|---------|---------|---------|--------|---------|
| | Commercial | | | | | | Subsistence | | | | | | Combined | | | | | |
| | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total |
| 1990 | 5,998 | 358 | 52,015 | 0 | 23,659 | 82,030 | 2,476 | a | a | a | a | a | 8,474 | a | a | a | a | a |
| 1991 | 4,534 | 147 | 52,033 | 0 | 39,609 | 96,323 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1992 | 3,409 | 229 | 84,449 | 6,284 | 52,547 | 146,918 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1993 | 5,944 | 251 | 26,290 | 42,061 | 28,156 | 102,702 | a | a | a | a | a | a | a | a | a | a | a | a |
| 1994 ^b | 4,400 | 71 | 71,019 | 480,158 | 12,288 | 567,936 | 3,035 | 404 | 11,386 | 27,163 | 3,325 | 45,313 | 7,435 | 475 | 82,405 | 507,321 | 15,613 | 613,249 |
| 1995 ^b | 7,617 | 78 | 31,280 | 37,009 | 24,843 | 100,827 | 3,114 | 591 | 9,833 | 16,625 | 5,458 | 35,621 | 10,731 | 669 | 41,113 | 53,634 | 30,301 | 136,448 |
| 1996 ^b | 3,644 | 0 | 52,200 | 113,837 | 7,369 | 177,050 | 3,023 | 181 | 11,187 | 18,026 | 4,227 | 36,644 | 6,667 | 181 | 63,387 | 131,863 | 11,596 | 213,694 |
| 1997 ^b | 9,067 | 159 | 26,079 | 0 | 17,139 | 52,444 | 4,191 | 196 | 6,746 | 10,600 | 1,603 | 23,336 | 13,258 | 355 | 32,825 | 10,600 | 18,742 | 75,780 |
| 1998 ^b | 6,413 | 7 | 24,534 | 99,412 | 6,210 | 136,576 | 4,066 | 201 | 7,489 | 13,654 | 3,038 | 28,448 | 10,479 | 208 | 32,023 | 113,066 | 9,248 | 165,024 |
| 1999 ^b | 1,927 | 0 | 10,264 | 0 | 5,700 | 17,891 | 2,691 | 537 | 8,140 | 10,060 | 3,692 | 25,120 | 4,618 | 537 | 18,404 | 10,060 | 9,392 | 43,011 |
| 2000 ^b | 582 | 11 | 29,803 | 17,278 | 2,700 | 50,374 | 2,429 | 212 | 5,878 | 10,540 | 3,000 | 22,059 | 3,011 | 223 | 35,681 | 27,818 | 5,700 | 72,433 |
| 2001 ^b | 116 | 1 | 15,102 | 0 | 1,512 | 16,731 | 2,810 | 359 | 6,270 | 11,269 | 2,918 | 23,626 | 2,926 | 360 | 21,372 | 11,269 | 4,430 | 40,357 |
| 2002 ^b | 4 | 1 | 1,079 | 0 | 339 | 1,423 | 2,367 | 280 | 4,988 | 15,915 | 3,877 | 27,427 | 2,371 | 281 | 6,067 | 15,915 | 4,216 | 28,850 |
| 2003 ^b | 10 | 21 | 13,029 | 0 | 3,075 | 16,135 | 2,585 | 297 | 6,192 | 21,779 | 1,785 | 32,638 | 2,595 | 318 | 19,221 | 21,779 | 4,860 | 48,773 |
| 2004 | 22 | 47 | 29,282 | 0 | 4,924 | 34,275 | 2,829 | 417 | 6,653 | 22,755 | 2,154 | 34,808 | 2,851 | 464 | 35,935 | 22,755 | 7,078 | 69,083 |
| 2005 | 101 | 12 | 63,705 | 0 | 3,192 | 67,010 | 2,193 | 656 | 7,886 | 25,447 | 2,660 | 38,842 | 2,294 | 668 | 71,591 | 25,447 | 5,852 | 105,852 |
| 2006 | 12 | 3 | 98,336 | 0 | 6,721 | 105,072 | 2,537 | 326 | 9,905 | 22,547 | 2,712 | 38,027 | 2,549 | 329 | 108,241 | 22,547 | 9,433 | 143,099 |
| 2007 | 13 | 2 | 88,418 | 2,121 | 11,788 | 102,342 | 1,666 | 292 | 5,859 | 11,674 | 2,057 | 21,547 | 1,678 | 294 | 94,277 | 13,795 | 13,845 | 123,889 |
| 2008 | 65 | 36 | 77,227 | 48,839 | 17,648 | 143,815 | 1,402 | 137 | 7,452 | 15,116 | 2,805 | 26,912 | 1,467 | 173 | 84,679 | 63,955 | 20,453 | 170,727 |
| 2009 | 80 | 89 | 60,230 | 11,625 | 20,647 | 92,671 | 1,892 | 200 | 6,923 | 11,707 | 2,708 | 23,430 | 1,972 | 289 | 67,153 | 23,332 | 23,355 | 116,101 |
| 2010 | 124 | 71 | 32,839 | 10,641 | 30,588 | 74,263 | 1,257 | 297 | 3,780 | 9,002 | 3,159 | 17,495 | 1,381 | 368 | 36,619 | 19,643 | 33,747 | 91,758 |
| 2011 | 124 | 279 | 29,518 | 6,292 | 34,003 | 70,216 | 607 | 189 | 2,486 | 5,608 | 3,316 | 12,206 | 731 | 468 | 32,004 | 11,900 | 37,319 | 82,422 |
| 2012 | 157 | 74 | 22,274 | 52,445 | 28,161 | 103,111 | 808 | 192 | 4,558 | 9,460 | 3,973 | 18,991 | 965 | 266 | 26,832 | 61,905 | 32,134 | 122,102 |
| 2013 | 131 | 171 | 29,390 | 6,056 | 54,873 | 90,621 | 468 | 221 | 6,117 | 7,724 | 3,129 | 17,659 | 599 | 392 | 35,507 | 13,780 | 58,002 | 108,280 |
| 5-year avg. ^c | 110 | 110 | 44,418 | 25,968 | 26,209 | 96,815 | 1,193 | 203 | 5,040 | 10,179 | 3,192 | 19,807 | 1,303 | 313 | 49,457 | 36,147 | 29,402 | 116,622 |
| 10-year avg. ^d | 71 | 63 | 51,486 | 13,196 | 16,075 | 80,891 | 1,778 | 300 | 6,169 | 15,510 | 2,733 | 26,490 | 1,848 | 364 | 57,655 | 28,706 | 18,808 | 107,381 |

Note: Commercial harvest numbers may include a small number of salmon reported on fish tickets that were retained for personal use and not commercially sold.

^a Subsistence surveys were not conducted.

^b Subsistence harvests were estimated from Division of Subsistence household surveys. Previous surveys often were partial surveys that did not capture later season harvests by fishermen.

^c 2008–2012.

^d 2003–2012.

Appendix A12.–Subsistence salmon catch by species and year for St. Michael and Stebbins in Norton Sound District, 1994–2013.

| Year | Chinook | Chum | Pink | Sockeye | Coho | Total |
|------------|---------|---|-------|---------|-------|--------|
| St Michael | | | | | | |
| 1994 | 769 | 4,309 | 2,673 | 127 | 1,022 | 8,900 |
| 1995 | 1,267 | 5,778 | 391 | 45 | 2,235 | 9,716 |
| 1996 | 1,400 | 6,352 | 1,503 | 3 | 1,641 | 10,899 |
| 1997 | 970 | 2,816 | 84 | 41 | 547 | 4,458 |
| 1998 | 542 | 1,502 | 961 | 143 | 1,406 | 4,554 |
| 1999 | 1,053 | 3,036 | 365 | 111 | 798 | 5,363 |
| 2000 | 160 | 1,381 | 80 | 16 | 1,180 | 2,817 |
| 2001 | 282 | 2,246 | 229 | 17 | 490 | 3,264 |
| 2002 | 227 | 1,136 | 583 | 20 | 989 | 2,955 |
| 2003 | 295 | 1,994 | 577 | 89 | 1,438 | 4,393 |
| 2004 | | Subsistence surveys were not conducted. | | | | |
| 2005 | 998 | 3,614 | 1,742 | 61 | 1,497 | 7,912 |
| 2006 | 271 | 2,628 | 480 | 347 | 1,256 | 4,982 |
| 2007 | 452 | 2,119 | 265 | 9 | 622 | 3,467 |
| 2008 | | Subsistence surveys were not conducted. | | | | |
| 2009 | 825 | 921 | 169 | 24 | 1,088 | 3,027 |
| 2010 | | Subsistence surveys were not conducted. | | | | |
| 2011 | | Subsistence surveys were not conducted. | | | | |
| 2012 | 80 | 2,172 | 457 | 20 | 911 | 3,640 |
| 2013 | | Subsistence surveys were not conducted. | | | | |
| Stebbins | | | | | | |
| 1994 | 1,525 | 5,989 | 5,552 | 288 | 3,948 | 17,302 |
| 1995 | 1,211 | 5,042 | 758 | 207 | 2,570 | 9,788 |
| 1996 | 1,030 | 7,401 | 2,375 | 424 | 3,746 | 14,976 |
| 1997 | 1,164 | 3,230 | 243 | 116 | 1,826 | 6,579 |
| 1998 | 1,410 | 3,909 | 3,125 | 295 | 3,116 | 11,855 |
| 1999 | 760 | 3,312 | 459 | 200 | 1,312 | 6,043 |
| 2000 | 298 | 2,913 | 364 | 341 | 2,429 | 6,345 |
| 2001 | 570 | 3,999 | 202 | 0 | 2,759 | 7,530 |
| 2002 | 450 | 3,586 | 7,459 | 300 | 2,324 | 14,119 |
| 2003 | 265 | 2,399 | 2,685 | 171 | 1,215 | 6,735 |
| 2004 | | Subsistence surveys were not conducted. | | | | |
| 2005 | 485 | 5,164 | 4,353 | 59 | 2,702 | 12,763 |
| 2006 | 355 | 4,236 | 4,321 | 140 | 4,856 | 13,908 |
| 2007 | 763 | 4,980 | 1,881 | 0 | 2,006 | 9,630 |
| 2008 | | Subsistence surveys were not conducted. | | | | |
| 2009 | 713 | 1,461 | 328 | 0 | 1,114 | 3,616 |
| 2010 | | Subsistence surveys were not conducted. | | | | |
| 2011 | | Subsistence surveys were not conducted. | | | | |
| 2012 | 109 | 3,456 | 3,659 | 0 | 1,256 | 8,480 |
| 2013 | | Subsistence surveys were not conducted. | | | | |

Note: Harvest numbers shown have been expanded to include households not contacted.

Appendix A13.—Commercial, subsistence, and sport salmon catch by species, by year for Subdistricts 1–6 in Norton Sound District, 1990–2013.

| Year | SUBDISTRICTS 1–6 | | | | | | | | | | | | | | | | | |
|---------------------------|------------------|---------|---------|---------|---------|-----------|-------------|---------|--------|--------|--------|---------|------------|---------|--------|-------|-------|--------|
| | Commercial | | | | | | Subsistence | | | | | | Sport fish | | | | | |
| | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total | Chinook | Sockeye | Coho | Pink | Chum | Total |
| 1990 ^a | 8,895 | 434 | 56,712 | 501 | 65,123 | 131,665 | 2,534 | 234 | 510 | 2,233 | 4,246 | 7,281 | 364 | 198 | 3,305 | 7,647 | 925 | 12,439 |
| 1991 ^a | 6,068 | 203 | 63,647 | 0 | 86,871 | 156,789 | 395 | 166 | 3,432 | 3,749 | 6,375 | 14,117 | 404 | 237 | 5,800 | 1,738 | 1,415 | 9,594 |
| 1992 ^a | 4,541 | 296 | 105,418 | 6,284 | 83,394 | 199,933 | 252 | 163 | 2,762 | 13,503 | 2,944 | 19,624 | 204 | 131 | 4,671 | 6,403 | 523 | 11,932 |
| 1993 ^a | 8,972 | 279 | 43,283 | 157,574 | 53,562 | 263,670 | 420 | 80 | 3,287 | 2,599 | 3,401 | 9,787 | 595 | 10 | 3,783 | 2,250 | 691 | 7,329 |
| 1994 | 5,285 | 80 | 102,140 | 982,389 | 18,290 | 1,108,184 | 5,116 | 747 | 17,429 | 66,656 | 15,613 | 105,561 | 600 | 18 | 5,547 | 7,051 | 536 | 13,752 |
| 1995 | 8,860 | 128 | 47,863 | 81,644 | 42,898 | 181,393 | 5,367 | 908 | 17,867 | 37,515 | 31,761 | 95,536 | 438 | 104 | 3,705 | 928 | 394 | 5,569 |
| 1996 | 4,984 | 1 | 68,206 | 487,441 | 10,609 | 571,241 | 4,944 | 586 | 21,040 | 60,676 | 20,286 | 107,532 | 662 | 100 | 7,289 | 5,972 | 662 | 14,685 |
| 1997 | 12,573 | 161 | 32,284 | 20 | 34,103 | 79,141 | 6,760 | 839 | 11,922 | 24,233 | 16,906 | 60,660 | 1,106 | 30 | 4,393 | 1,458 | 278 | 7,265 |
| 1998 | 7,429 | 7 | 29,623 | 588,013 | 16,324 | 641,396 | 6,345 | 393 | 13,929 | 46,961 | 14,497 | 82,125 | 590 | 16 | 4,441 | 6,939 | 682 | 12,668 |
| 1999 | 2,508 | 0 | 12,662 | 0 | 7,881 | 23,051 | 4,331 | 866 | 12,233 | 19,186 | 13,049 | 49,665 | 630 | 0 | 5,582 | 3,039 | 211 | 9,462 |
| 2000 | 752 | 14 | 44,409 | 166,548 | 6,150 | 217,873 | 3,690 | 324 | 13,455 | 37,773 | 12,989 | 68,231 | 889 | 45 | 7,441 | 2,886 | 1,097 | 12,358 |
| 2001 | 213 | 44 | 19,492 | 0 | 11,100 | 30,849 | 4,724 | 750 | 11,293 | 29,812 | 13,963 | 60,542 | 271 | 39 | 4,802 | 360 | 1,709 | 7,181 |
| 2002 | 5 | 1 | 1,759 | 0 | 600 | 2,365 | 4,792 | 443 | 11,773 | 56,669 | 13,095 | 86,772 | 802 | 0 | 4,211 | 4,303 | 818 | 10,134 |
| 2003 | 12 | 21 | 17,060 | 0 | 3,560 | 20,653 | 4,728 | 536 | 11,446 | 46,338 | 9,498 | 72,546 | 239 | 572 | 3,039 | 2,222 | 292 | 6,364 |
| 2004 ^a | 22 | 47 | 42,016 | 0 | 6,296 | 48,381 | 4,448 | 541 | 11,579 | 72,887 | 4,541 | 93,996 | 535 | 404 | 5,806 | 8,309 | 498 | 15,552 |
| 2005 ^a | 151 | 12 | 85,523 | 0 | 3,983 | 89,669 | 3,383 | 857 | 12,783 | 57,785 | 6,115 | 80,923 | 216 | 0 | 3,959 | 473 | 36 | 4,684 |
| 2006 ^a | 20 | 3 | 130,808 | 0 | 10,042 | 140,873 | 3,258 | 572 | 19,267 | 56,579 | 5,942 | 85,618 | 427 | 22 | 11,427 | 5,317 | 344 | 17,537 |
| 2007 ^a | 19 | 2 | 126,136 | 3,769 | 22,431 | 152,357 | 2,647 | 938 | 11,879 | 20,954 | 12,011 | 48,428 | 147 | 15 | 6,179 | 1,331 | 96 | 7,768 |
| 2008 | 83 | 60 | 120,309 | 75,525 | 25,124 | 221,101 | 2,465 | 363 | 17,604 | 54,927 | 8,709 | 84,068 | 580 | 63 | 10,756 | 6,855 | 341 | 18,595 |
| 2009 | 84 | 126 | 87,041 | 17,364 | 34,122 | 138,737 | 3,382 | 369 | 14,898 | 26,112 | 8,946 | 53,707 | 277 | 0 | 6,664 | 1,321 | 417 | 8,679 |
| 2010 | 140 | 103 | 62,079 | 31,557 | 117,743 | 211,622 | 2,120 | 549 | 11,863 | 42,254 | 16,201 | 72,987 | 61 | 0 | 5,876 | 2,717 | 118 | 8,772 |
| 2011 | 185 | 369 | 58,917 | 7,141 | 110,555 | 177,167 | 1,359 | 414 | 8,538 | 17,166 | 14,556 | 42,033 | 61 | 58 | 3,582 | 566 | 139 | 4,406 |
| 2012 | 197 | 134 | 37,056 | 205,498 | 62,772 | 305,657 | 1,235 | 424 | 9,573 | 43,551 | 12,399 | 67,182 | 0 | 28 | 5,099 | 3,220 | 209 | 8,556 |
| 2013 | 151 | 247 | 53,802 | 8,338 | 118,709 | 181,247 | 861 | 572 | 13,372 | 18,045 | 15,504 | 48,354 | 0 | 23 | 7,567 | 1,806 | 2,267 | 11,663 |
| 5-year avg. ^b | 138 | 158 | 73,080 | 67,417 | 70,063 | 210,857 | 2,112 | 424 | 12,495 | 36,802 | 12,162 | 63,995 | 196 | 30 | 6,395 | 2,936 | 245 | 9,802 |
| 10-year avg. ^c | 91 | 88 | 76,695 | 34,085 | 39,663 | 150,622 | 2,903 | 556 | 12,943 | 43,855 | 9,892 | 70,149 | 254 | 116 | 6,239 | 3,233 | 249 | 10,091 |

Note: Commercial harvest may include a small number of salmon reported on fish tickets that were retained for personal use and not commercially sold. ND is no data or insufficient data.

^a Not all subdistricts were surveyed.

^b 2008–2012.

^c 2003–2012.

Appendix A14.–Sport salmon harvest by species, by year for the Unalakleet River, 1990–2013.

| Year | Chinook | Coho | Chum | Pink | Total |
|---------------|---------|-------|------|-------|-------|
| 1990 | 276 | 1,826 | 298 | 1,180 | 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 | 356 | 3,524 | 47 | 2,003 | 5,930 |
| 2005 | 216 | 3,959 | 36 | 473 | 4,684 |
| 2006 | 394 | 4,985 | 224 | 891 | 6,494 |
| 2007 | 147 | 4,117 | 85 | 618 | 4,967 |
| 2008 | 580 | 6,029 | 175 | 2,077 | 8,861 |
| 2009 | 236 | 5,095 | 260 | 586 | 6,177 |
| 2010 | 61 | 3,006 | 59 | 535 | 3,661 |
| 2011 | 54 | 2,493 | 77 | 391 | 3,015 |
| 2012 | 0 | 3,283 | 118 | 20 | 3,421 |
| 2013 | 0 | 4,068 | 354 | 886 | 5,308 |
| Avg 2008–2012 | 186 | 3,981 | 138 | 722 | 5,027 |
| Avg 2003–2012 | 214 | 3,810 | 127 | 762 | 4,913 |

Appendix A15.–Sport salmon harvest by species, by year for the Fish/Niukluk rivers, 1990–2013.

| Year | Chinook | Coho | Chum | Pink | Total |
|---------------|---------|-------|------|------|-------|
| 1990 | 0 | 267 | 216 | 638 | 1,121 |
| 1991 | 14 | 977 | 272 | 356 | 1,619 |
| 1992 | 0 | 753 | 15 | 357 | 1,125 |
| 1993 | 9 | 1,185 | 514 | 278 | 1,986 |
| 1994 | 10 | 1,122 | 119 | 231 | 1,482 |
| 1995 | 18 | 818 | 27 | 136 | 999 |
| 1996 | 11 | 1,652 | 166 | 404 | 2,233 |
| 1997 | 71 | 462 | 0 | 58 | 591 |
| 1998 | 0 | 316 | 0 | 0 | 316 |
| 1999 | 44 | 1,365 | 0 | 80 | 1,489 |
| 2000 | 174 | 1,165 | 0 | 51 | 1,390 |
| 2001 | 0 | 969 | 439 | 161 | 1,569 |
| 2002 | 75 | 298 | 45 | 254 | 672 |
| 2003 | 39 | 216 | 101 | 196 | 552 |
| 2004 | 22 | 291 | 435 | 353 | 1,101 |
| 2005 | 37 | 400 | 0 | 58 | 495 |
| 2006 | 0 | 948 | 0 | 134 | 1,082 |
| 2007 | 0 | 786 | 11 | 30 | 827 |
| 2008 | 0 | 1,986 | 166 | 969 | 3,121 |
| 2009 | 30 | 939 | 72 | 25 | 1,066 |
| 2010 | 0 | 1,069 | 0 | 99 | 1,168 |
| 2011 | 0 | 700 | 29 | 10 | 739 |
| 2012 | 0 | 1,163 | 74 | 636 | 1,873 |
| 2013 | 0 | 1,227 | 0 | 0 | 1,227 |
| Avg 2008–2012 | 6 | 1,171 | 68 | 348 | 1,593 |
| Avg 2003–2012 | 13 | 850 | 89 | 251 | 1,202 |

Appendix A16.—Sport salmon harvest by species, by year for the Nome River, 1990–2013.

| Year | Chinook | Coho | Chum | Pink | Total |
|---------------|---------|-------|------|-------|-------|
| 1990 | 39 | 407 | 122 | 2,651 | 3,219 |
| 1991 | 22 | 417 | 241 | 356 | 1,036 |
| 1992 | 16 | 713 | 0 | 4,397 | 5,126 |
| 1993 | 93 | 602 | 0 | 723 | 1,418 |
| 1994 | 0 | 326 | 0 | 4,103 | 4,429 |
| 1995 | 0 | 143 | 0 | 230 | 373 |
| 1996 | 0 | 598 | 0 | 3,280 | 3,878 |
| 1997 | 10 | 295 | 0 | 83 | 388 |
| 1998 | 0 | 189 | 0 | 1,985 | 2,174 |
| 1999 | 0 | 219 | 0 | 0 | 219 |
| 2000 | 0 | 342 | 0 | 578 | 920 |
| 2001 | 0 | 297 | 0 | 0 | 297 |
| 2002 | 0 | 217 | 0 | 312 | 529 |
| 2003 | 0 | 68 | 0 | 12 | 80 |
| 2004 | 0 | 270 | 0 | 3,369 | 3,639 |
| 2005 | 0 | 1,001 | 0 | 1,193 | 2,194 |
| 2006 | 0 | 2,768 | 0 | 2,422 | 5,190 |
| 2007 | 0 | 797 | 0 | 402 | 1,199 |
| 2008 | 0 | 1,793 | 0 | 2,954 | 4,747 |
| 2009 | 0 | 229 | 0 | 178 | 407 |
| 2010 | 13 | 602 | 0 | 1,716 | 2,331 |
| 2011 | 0 | 68 | 0 | 85 | 153 |
| 2012 | 0 | 259 | 0 | 1,264 | 1,523 |
| 2013 | 0 | 279 | 139 | 302 | 720 |
| Avg 2008–2012 | 3 | 590 | 0 | 1,239 | 1,832 |
| Avg 2003–2012 | 1 | 786 | 0 | 1,360 | 2,146 |

Appendix A17.—Comparative salmon aerial survey escapement indices of Norton Sound streams unless noted otherwise, 1990–2013.

| Year ^a | Sinuk River | | | | Nome River | | | |
|-------------------|----------------|---------------------|------------------------|--------------------|---------------------|--------------------|----------------------|--------------------|
| | Chinook | Chum | Pink | Coho | Chinook | Chum | Pink | Coho |
| 1990 | ND | 95 | 29,040 | 161 | ND | 541 | 13,085 | 377 |
| 1991 | 3 | 5,420 | 14,680 | 701 | 11 | 3,520 | 4,690 | 611 |
| 1992 | 1 | 470 | 292,400 | 422 | 3 | 813 | 255,700 | 691 |
| 1993 | 7 | 1,570 | 5,120 | 104 | 8 | 1,520 | 8,941 | 276 |
| 1994 | 10 | 1,140 | 492,000 | 307 | 2 | 350 | 265,450 | 631 |
| 1995 | ND | 3,110 | 1,250 | 290 | ND | 1,865 | 182 | 517 |
| 1996 | 5 | 1,815 | 74,100 | 367 | 1 | 799 | 34,520 | 723 |
| 1997 | ND | 2,975 | 1,200 | 57 | 4 | 956 | 65 | 544 |
| 1998 | ND | 630 | 372,850 | 322 | 3 | 335 | 179,680 | 515 |
| 1999 | ND | 1,697 | 180 | 217 | ND | 375 | 345 | 620 |
| 2000 | ND | 10 | 12,608 | 912 | ND | 658 | 6,380 | 1,032 |
| 2001 | ND | 3,746 | 115 ^b | 750 | ND | 946 ^b | 790 ^b | 1,307 ^b |
| 2002 | ND | 1,682 | 28,487 | 1,290 ^b | ND | 127 ^b | 295 ^b | 1,796 |
| 2003 | ND | 677 | 9,885 | 190 | 8 | 337 | 2,841 | 604 |
| 2004 | ND | 100 ^b | 1,267,100 ^b | 2,085 | ND | 3 ^b | 707,350 ^b | 1,687 |
| 2005 | ND | 1,072 ^b | 211,000 ^b | 2,045 | 2 ^b | 2,082 ^b | 212,000 ^b | 3,541 |
| 2006 | 0 ^b | 1115 ^b | 515,000 ^b | 2,147 | 0 ^b | 394 ^b | 441,550 ^b | 3,650 |
| 2007 | 3 ^b | 7,210 ^b | 6,810 ^b | 668 | 4 ^b | 1,449 ^b | 3,378 ^b | 1,442 |
| 2008 | ND | ND | 1,496,000 ^b | 1,633 | ND | 106 ^b | 528,000 ^b | 2,051 |
| 2009 | 0 ^b | 344 ^b | 6,730 ^b | 508 ^b | ND | ND | ND | 877 ^b |
| 2010 | 0 ^b | 3,955 ^b | 168,600 ^b | 5,507 ^b | 0 ^b | 2,998 ^b | 98,272 ^b | 0 ^b |
| 2011 | 0 ^b | 6,265 ^b | 21,100 ^b | 479 ^b | 0 ^b | 1,317 ^b | 9,575 ^b | 870 ^b |
| 2012 | 0 ^b | 3,650 ^b | 506,500 ^b | ND | No survey occurred. | | | |
| 2013 | 0 ^b | 19,500 ^b | 23,000 ^b | 1,054 ^b | No survey occurred. | | | |

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Appendix A17.–Page 2 of 4.

| Year ^a | Flambeau River | | | | Eldorado River | | | |
|-------------------|----------------|---------------------|----------------------|------------------|-----------------|---------------------|----------------------|------------------|
| | Chinook | Chum | Pink | Coho | Chinook | Chum | Pink | Coho |
| 1990 | ND | 905 | ND | 96 | 17 | 884 | 2,050 | 44 |
| 1991 | ND | 2,828 | 7,180 | ND | 76 | 5,755 | 1,590 | 98 |
| 1992 | ND | 55 | ND | 42 | 2 | 4,887 | 6,615 | 113 |
| 1993 | ND | 819 | 640 | 11 | 38 | 2,895 | 120 | 111 |
| 1994 | ND | 3,612 | 4 | 213 | ND | 5,140 | 53,890 | 242 |
| 1995 | ND | 1,876 | 1,102 | 186 | 4 | 9,025 | 50 | 247 |
| 1996 | ND | 647 | 355 | 71 | 21 | 20,710 | 40,100 | 254 |
| 1997 | ND | 2,250 ^b | 200 ^b | 751 | 40 | 5,967 | 10 | 37 |
| 1998 | ND | 2,828 | 7,180 | ND | ND | 3,000 | 123,950 | 71 |
| 1999 | ND | 55 | ND | 42 | 2 | 1,741 | 6 | 45 |
| 2000 | ND | 819 | 640 | 11 | 2 | 3,383 | 16,080 | 24 |
| 2001 | ND | 3,612 | 4 | 213 | 2 | 4,450 | 8 | 232 |
| 2002 | ND | 1,876 | 1,102 | 186 | 8 | 139 | 58,700 | 463 |
| 2003 | ND | 647 | 355 | 71 | 12 | 1,257 | 821 | 71 |
| 2004 | ND | 2,250 ^b | 200 ^b | 751 | ND | 109 ^b | 52,000 ^b | 755 |
| 2005 | ND | 2,261 ^b | 100 ^b | 154 | 2 ^b | 5,445 ^b | 2,050 ^b | 376 |
| 2006 | 0 ^b | 16,000 ^b | 8,800 ^b | ND | 0 ^b | 2,355 ^b | 156,500 ^b | 523 |
| 2007 | 1 ^b | 4,452 ^b | 0 ^b | 38 | 2 ^b | 6,315 ^b | 318 ^b | 34 |
| 2008 | 0 ^b | 4,235 ^b | 106,200 ^b | 918 | | No survey occurred. | | |
| 2009 | 0 ^b | 860 ^b | 1,598 ^b | 627 ^b | 14 ^b | 1,069 ^b | 210 ^b | 301 ^b |
| 2010 | 0 ^b | 13,600 ^b | 36,000 ^b | ND | 0 ^b | 30,600 ^b | 84,582 ^b | ND |
| 2011 | 0 ^b | 5,283 ^b | 1,810 ^b | 292 ^b | 0 ^b | 9,225 ^b | 260 ^b | 120 ^b |
| 2012 | 0 ^b | 7,911 ^b | ND | ND | | No survey occurred. | | |
| 2013 | 0 ^b | 16,088 ^b | ND | ND | 4 ^b | 16,859 ^b | 52 ^b | ND |

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Appendix A17.–Page 3 of 4.

| Year ^a | Fish River | | | | Boston Creek | | | |
|-------------------|-----------------|---------------------|-----------|-------|-----------------|---------------------|--------------------|-----------------|
| | Chinook | Chum | Pink | Coho | Chinook | Chum | Pink | Coho |
| 1990 | | No survey occurred. | | | 112 | 1,455 | 8,440 | ND |
| 1991 | 58 | 10,470 | 51,190 | ND | 152 | 2,560 | 3,210 | ND |
| 1992 | 4 | 390 | 1,387,000 | ND | 68 | 1,540 | 50,850 | ND |
| 1993 | 48 | 12,695 | 13,440 | ND | 227 | 4,563 | 1,930 | ND |
| 1994 | 55 | 16,500 | 910,000 | ND | 95 | 4,270 | 355,600 | ND |
| 1995 | 40 | 13,433 | 780 | 1,829 | 78 | 4,221 | ND | 230 |
| 1996 | 189 | 5,840 ^c | 684,780 | ND | ND | 3,505 ^c | 35,980 | ND |
| 1997 | 110 | 19,515 | 800 | 465 | 452 | 4,545 | ND | ND |
| 1998 | 96 | 28,010 | 663,050 | ND | 255 | 1,570 | 175,330 | ND |
| 1999 | ND | 50 | 20 | 821 | ND | ND | ND | 319 |
| 2000 | ND | ND | ND | 805 | ND | ND | ND | 414 |
| 2001 | 8 | 3,220 | 1,744 | 1,055 | 33 | 3,533 | 1,038 | 155 |
| 2003 | 95 | 3,200 | 1,014 | ND | 145 | 750 | 701 | ND |
| 2004 | 19 | 621 | 404,930 | 90 | 93 | 55 | 135,000 | 140 |
| 2005 | 0 | 6,875 | 319,170 | ND | 46 | 1,675 | 5,850 | ND |
| 2010 | | No survey occurred. | | | 29 ^b | 3,010 ^b | 5,110 ^b | 73 ^b |
| 2013 | 15 ^b | 2,550 ^b | ND | ND | 19 ^b | 16,100 ^b | ND | ND |

| Year ^a | Niukluk River | | | | Kwiniuk River | | | |
|-------------------|-----------------|---------------------|--------------------|--------------------|----------------------|-------------------|-------------------|--------------------|
| | Chinook | Chum | Pink | Coho | Chinook ^d | Chum ^d | Pink ^d | Coho ^d |
| 1990 | 15 | 6,200 | 115,250 | 170 | 744 | 13,735 | 416,511 | 746 ^e |
| 1991 | 42 | 10,700 | 37,410 | 1,783 ^f | 587 | 18,802 | 53,499 | 809 ^e |
| 1992 | ND | 7,770 | 803,200 | 812 | 479 | 12,077 | 1,464,717 | 532 ^e |
| 1993 | 15 | 19,910 | 2,840 | 2,104 | 565 | 15,823 | 43,065 | 1,238 ^e |
| 1994 | 7 | 16,470 | 1,294,100 | 274 | 627 | 33,010 | 2,304,099 | 2,547 |
| 1995 | 48 | 25,358 | 200 | 2,136 | 468 | 42,161 | 17,509 | 1,625 ^e |
| 1996 | 25 | 9,732 ^c | 153,150 | 2,047 | 567 | 27,256 | 907,894 | 1,410 ^e |
| 1997 | 131 | 16,550 | ND | 983 | 972 | 20,118 | 9,536 | 610 ^e |
| 1998 | 51 | 2,556 | 205,110 | 593 | 296 | 24,248 | 655,933 | 610 ^e |
| 1999 | ND | 640 | ND | 619 | 115 | 8,763 | 608 | 223 ^e |
| 2000 | ND | ND | ND | 3,812 | 144 | 12,878 | 750,173 | 541 ^e |
| 2001 | 6 | 2,448 | 2,856 | 809 | 258 | 16,598 | 8,423 | 9,532 |
| 2002 | ND | ND | ND | 1,122 | 778 | 37,995 | 111,410 | 6,459 |
| 2003 | 55 | 2,315 | 272 | 146 | 744 | 12,123 | 22,329 | 5,490 |
| 2004 | 15 | 173 | 277,900 | 828 | 663 | 10,362 | 3,054,684 | 11,240 |
| 2005 | 6 | 3,225 | 154,000 | ND | 342 | 12,083 | 341,048 | 12,950 |
| 2006 | ND | ND | ND | 737 ^g | 195 | 39,519 | 1,347,090 | 22,341 |
| 2007 | ND | ND | ND | ND | 258 | 27,756 | 54,225 | 9,429 |
| 2008 | ND | ND | ND | 1,715 | 237 | 9,483 | 1,444,213 | 10,461 |
| 2009 | | No survey occurred. | | | 444 | 8,739 | 42,960 | 9,036 |
| 2010 | | No survey occurred. | | | 135 | 71,388 | 634,220 | 8,049 |
| 2011 | 4 ^b | 9,735 ^b | 375 ^b | 838 ^b | 57 | 31,604 | 30,023 | 3,288 |
| 2012 | ND | ND | ND | 928 ^b | 54 | 5,577 | 393,302 | 777 |
| 2013 | 68 ^b | 17,203 ^b | 9,700 ^b | 2,279 ^b | 15 | 5,631 | 13,212 | 3,940 |

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Appendix A17.–Page 4 of 4.

| Year ^a | Tubutulik River | | | | North River | | | |
|-------------------|---------------------|---------------------|--------------------|--------------------|---------------------|------------------|---------|------------------|
| | Chinook | Chum | Pink | Coho | Chinook | Chum | Pink | Coho |
| 1990 | 397 | 4,350 | 186,400 | ND | 255 | 1,345 | 25,685 | ND |
| 1991 | 661 | 7,085 | 26,870 | ND | 656 | 2,435 | 119,140 | 2,510 |
| 1992 | 260 | 2,595 | 138,600 | ND | 329 | ND | 631,140 | 398 |
| 1993 | 1,061 | 8,740 | 18,650 | 1,395 | 900 | 445 | 13,570 | 1,397 |
| 1995 | 377 | 16,158 | 4,020 | 930 | 622 | 1,370 | 18,300 | 690 ^h |
| 1996 | 439 | 10,790 | 226,750 | ND | 106 | 270 ^c | 125,500 | 917 |
| 1997 | 1,946 | 3,105 | 16,890 | ND | 1,605 | 9,045 | 17,870 | ND |
| 1998 | 894 | 10,180 | 1,124,800 | ND | 591 | 50 | 153,150 | 233 |
| 1999 | No survey occurred. | | | | 18 | 1,480 | 3,790 | 533 |
| 2001 | 77 | 863 | ND | ND | 367 | 330 | ND | ND |
| 2002 | 42 | 180 | 182,000 | ND | 122 | 217 | 4,590 | 800 |
| 2003 | 50 | 1,352 | 60 | 292 | 131 | 222 | 11,010 | ND |
| 2004 | 321 | 1,117 | 391,000 | 779 | 189 | 283 | 264,000 | 1,386 |
| 2005 | 78 | 1,336 | 48,203 | ND | 156 | 310 | 381,150 | 1,963 |
| 2007 | 823 | 7,045 | 32,250 | 4,552 | 554 | 295 | 50,100 | 2,349 |
| 2008 | ND | ND | ND | 4,197 | ND | ND | ND | 2,774 |
| 2009 | 627 | 3,161 | 12,695 | ND | 438 | 3,263 | 189,939 | 2,830 |
| 2010 | 122 | 16,097 | 16,520 | 50 | 124 | 1,627 | 1,480 | 200 |
| 2011 | 141 ^b | 14,127 ^b | 3,875 ^b | 1,606 | 433 | 9,785 | 20,920 | 898 |
| 2012 | ND | ND | ND | 2,889 ^b | No survey occurred. | | | |
| 2013 | 2 | 4,532 | 700 | ND | 339 | 2,425 | 5,025 | 867 |

Note: Years for which there are no survey or weir count data are excluded.

^a Represents “high count” for season.

^b Helicopter survey.

^c Numerous pink salmon made enumerating of chum salmon difficult; pink count may include some chum.

^d Total counts obtained from counting tower.

^e Aerial survey, not tower count.

^f Includes counts from Casadepaga and Ophir Creeks.

^g Includes counts from Ophir Creek.

^h Poor survey conditions or partial survey, poor counting tower conditions.

Appendix A18.—Combined aerial survey numbers of chum, pink, coho, and Chinook salmon for Norton Sound, 1990–2013.

| Year ^a | Chum | Pink | Coho | Chinook |
|-------------------|---------|-----------|--------|---------|
| 1990 | 29,510 | 796,461 | 1,594 | 1,540 |
| 1991 | 69,575 | 319,459 | 6,512 | 2,246 |
| 1992 | 30,597 | 5,030,222 | 3,010 | 1,146 |
| 1993 | 68,980 | 108,316 | 6,636 | 2,869 |
| 1994 | 80,492 | 5,675,143 | 4,214 | 796 |
| 1995 | 118,577 | 43,393 | 8,680 | 1,637 |
| 1996 | 81,364 | 2,283,129 | 5,789 | 1,353 |
| 1997 | 85,026 | 46,571 | 3,447 | 5,260 |
| 1998 | 73,407 | 3,661,033 | 2,344 | 2,186 |
| 1999 | 14,801 | 4,949 | 3,439 | 135 |
| 2000 | 17,748 | 785,881 | 7,551 | 146 |
| 2001 | 39,746 | 14,978 | 14,053 | 751 |
| 2002 | 42,216 | 386,584 | 12,116 | 950 |
| 2003 | 22,880 | 49,288 | 6,864 | 1,240 |
| 2004 | 15,073 | 6,554,164 | 19,741 | 1,300 |
| 2005 | 36,364 | 1,674,571 | 21,029 | 632 |
| 2006 | 59,383 | 2,468,940 | 29,398 | 195 |
| 2007 | 54,522 | 147,081 | 18,512 | 1,645 |
| 2008 | 13,824 | 3,574,413 | 23,749 | 237 |
| 2009 | 17,436 | 254,132 | 14,179 | 1,523 |
| 2010 | 143,275 | 1,044,784 | 13,879 | 410 |
| 2011 | 87,341 | 87,563 | 8,391 | 633 |
| 2012 | 17,138 | 899,802 | 4,594 | 54 |
| 2013 | 100,888 | 51,689 | 8,140 | 462 |

^a Rivers surveyed were the Sinuk, Nome, Flambeau, Eldorado, Fish, Niukluk, Kwiniuk, Tubutulik, North, and Boston Creek. Not all rivers were surveyed for all the years. Kwiniuk numbers are from tower counts.

Appendix A19.—Total escapement for chum, pink, coho, and Chinook salmon from weir and tower projects at Kwiniuk, Niukluk, Nome, and Snake rivers (starting 1995), North River (starting 1996), and Eldorado River (starting 1997).

| Year | Chum | Pink | Coho ^a | Chinook |
|-------------------|---------|-----------|-------------------|---------|
| 1995 | 138,318 | 49,409 | 7,333 | 626 |
| 1996 ^b | 124,571 | 2,535,593 | 16,175 | 2,027 |
| 1997 | 109,961 | 163,728 | 11,434 | 5,550 |
| 1998 | 98,166 | 3,070,848 | 4,496 | 2,741 |
| 1999 | 55,352 | 73,077 | 10,069 | 1,846 |
| 2000 | 65,007 | 1,883,867 | 19,678 | 1,324 |
| 2001 | 70,451 | 79,706 | 30,645 | 1,718 |
| 2002 | 93,931 | 2,239,565 | 21,625 | 2,925 |
| 2003 | 49,749 | 392,827 | 13,761 | 2,466 |
| 2004 | 40,494 | 6,432,486 | 28,399 | 2,022 |
| 2005 | 68,585 | 2,594,334 | 44,351 | 1,530 |
| 2006 | 126,045 | 5,763,830 | 56,484 | 1,256 |
| 2007 | 123,394 | 708,669 | 37,112 | 2,324 |
| 2008 | 41,660 | 3,930,689 | 49,737 | 1,250 |
| 2009 | 41,800 | 275,835 | 39,236 | 3,050 |
| 2010 | 191,571 | 1,490,227 | 31,058 | 1,481 |
| 2011 | 99,261 | 191,243 | 11,494 | 955 |
| 2012 ^c | 50,916 | 994,745 | 6,003 | 1,078 |
| 2013 ^d | 49,836 | 72,495 | 16,616 | 605 |

^a Most projects did not operate during the coho season until 2001.

^b In 1996 the majority of pink salmon for Nome River escaped through the pickets and were not counted

^c Most projects were only operational for a short duration during coho season because of high water.

^d Starting in 2013, there was no longer a counting tower at Niukluk.

Appendix A20.—Total escapement (6 rivers) and catch (commercial, subsistence, and sport fish) for chum, pink, coho, and Chinook salmon for Norton Sound District, 1995–2013.

| Year ^{a, b} | Chum | Pink | Coho | Chinook |
|----------------------|---------|-----------|---------|---------|
| 1995 | 213,371 | 169,496 | 76,768 | 15,291 |
| 1996 ^c | 156,128 | 3,089,682 | 112,710 | 12,617 |
| 1997 ^d | 161,248 | 189,439 | 60,033 | 25,989 |
| 1998 ^d | 129,669 | 3,712,761 | 52,489 | 17,105 |
| 1999 | 76,493 | 95,302 | 40,546 | 9,315 |
| 2000 | 85,243 | 2,091,074 | 84,983 | 6,655 |
| 2001 | 97,223 | 109,878 | 66,232 | 6,926 |
| 2002 | 108,444 | 2,300,537 | 39,368 | 8,524 |
| 2003 | 63,099 | 441,387 | 45,306 | 7,445 |
| 2004 | 51,829 | 6,513,682 | 87,800 | 7,027 |
| 2005 | 78,719 | 2,652,592 | 146,616 | 5,280 |
| 2006 | 142,373 | 5,825,726 | 217,986 | 4,961 |
| 2007 | 157,932 | 734,723 | 181,306 | 5,137 |
| 2008 | 75,834 | 4,067,996 | 198,406 | 4,378 |
| 2009 | 85,285 | 320,632 | 147,839 | 6,793 |
| 2010 | 325,633 | 1,566,755 | 110,876 | 3,802 |
| 2011 | 224,511 | 216,116 | 82,531 | 2,560 |
| 2012 | 126,296 | 1,247,014 | 57,731 | 2,510 |
| 2013 | 186,316 | 100,684 | 91,357 | 1,617 |

^a Kwiniuk, Niukluk, Nome, and Snake rivers (starting 1995), North River (starting 1996), Eldorado River (starting 1997).

^b Not all subdistricts from 2004 to 2007 were surveyed for subsistence use.

^c In 1996, the majority of pink salmon for Nome River escaped through the pickets and were not counted.

^d Subsistence totals for 1997 and 1998 include data from Savoonga and Gambell.

Appendix A21.–Nome Subdistrict chum salmon estimated escapement, 1999–2013.

| Year | Rivers | Aerial Survey Counts | Estimated Escapement ^a | Year | Rivers | Aerial Survey Counts | Estimated Escapement ^a |
|------|-----------------------|----------------------|-----------------------------------|------|-----------------------|----------------------|-----------------------------------|
| 1999 | Nome | | 1,048 | 2000 | Nome | 658 | 4,056 |
| | Snake ^b | | 484 | | Snake ^b | | 1,911 |
| | Eldorado ^b | | 4,218 | | Eldorado ^b | 3,383 | 11,617 |
| | Flambeau | 51 | 637 | | Flambeau | 819 | 3,947 |
| | Solomon | 51 | 637 | | Solomon | 150 | 1,294 |
| | Sinuk | 1,697 | 6,370 | | Sinuk ^c | | 7,198 |
| | Bonanza | 361 | 2,304 | | Bonanza | 1,130 | 4,876 |
| | | | <u>15,698</u> | | | <u>34,898</u> | |
| 2001 | Nome | 946 | 2,859 | 2002 | Nome | | 1,720 |
| | Snake ^b | 752 | 2,182 | | Snake ^b | 402 | 2,776 |
| | Eldorado ^b | 4,450 | 11,635 | | Eldorado ^b | | 10,215 |
| | Flambeau | 3,612 | 10,465 | | Flambeau | 1,876 | 6,804 |
| | Solomon | 280 | 1,949 | | Solomon | 325 | 2,150 |
| | Sinuk | 3,746 | 10,718 | | Sinuk | 1,682 | 6,333 |
| | Bonanza | 1,084 | 4,745 | | Bonanza | 595 | 3,199 |
| | | <u>44,553</u> | | | <u>33,197</u> | | |
| 2003 | Nome | 888 | 1,957 | 2004 | Nome | | 3,903 |
| | Snake | 440 | 2,201 | | Snake | | 2,146 |
| | Eldorado | 1,257 | 3,591 | | Eldorado | | 3,277 |
| | Flambeau | 647 | 3,380 | | Flambeau | 2,250 | 7,667 |
| | Solomon | 73 | 806 | | Solomon ^c | | 1,436 |
| | Sinuk | 677 | 3,482 | | Sinuk ^c | | 3,197 |
| | Bonanza | 220 | 1,664 | | Bonanza ^c | | 2,166 |
| | | <u>17,081</u> | | | <u>23,792</u> | | |
| 2005 | Nome | 2,082 | 5,584 | 2006 | Nome | 394 | 5,677 |
| | Snake | 1,842 | 2,967 | | Snake | 840 | 4,160 |
| | Eldorado | 5,445 | 10,369 | | Eldorado | 2,355 | 42,105 |
| | Flambeau | 2,261 | 7,692 | | Flambeau | 16,000 | 27,828 |
| | Solomon | 775 | 3,806 | | Solomon | 305 | 2,062 |
| | Sinuk | 1,072 | 4,710 | | Sinuk | 1,115 | 4,834 |
| | Bonanza | 1,370 | 5,534 | | Bonanza | 60 | 708 |
| | | <u>40,662</u> | | | <u>87,374</u> | | |
| 2007 | Nome | 1,449 | 7,034 | 2008 | Nome | 106 | 2,607 |
| | Snake | 1,702 | 8,147 | | Snake | | 1,244 |
| | Eldorado | 6,315 | 21,312 | | Eldorado | | 6,746 |
| | Flambeau | 4,452 | 12,006 | | Flambeau | 4,235 | 11,618 |
| | Solomon | 673 | 3,469 | | Solomon ^c | | 959 |
| | Sinuk | 7,210 | 16,481 | | Sinuk ^c | | 5,367 |
| | Bonanza | 2,628 | 8,491 | | Bonanza ^c | | 3,636 |
| | | <u>76,940</u> | | | <u>32,177</u> | | |

-continued-

Appendix A21.–Page 2 of 2.

| Year | Rivers | Aerial Survey Counts | Estimated Escapement ^a | Year | Rivers | Aerial Survey Counts | Estimated Escapement ^a |
|------|----------|----------------------|-----------------------------------|------|-----------------------|----------------------|-----------------------------------|
| 2009 | Nome | | 1,565 | 2010 | Nome | 2,998 | 5,906 |
| | Snake | | 891 | | Snake | 2,625 | 6,973 |
| | Eldorado | 1,069 | 4,943 | | Eldorado ^d | 30,600 | 42,612 |
| | Flambeau | 860 | 4,075 | | Flambeau | 13,600 | 25,009 |
| | Solomon | 89 | 918 | | Solomon | 454 | 2,678 |
| | Sinuk | 344 | 2,232 | | Sinuk | 3,955 | 11,107 |
| | Bonanza | 1,851 | 6,744 | | Bonanza | 686 | 3,513 |
| | | | <u>21,368</u> | | | | <u>97,798</u> |
| 2011 | Nome | | 3,582 | 2012 | Nome | | 2,015 |
| | Snake | | 4,343 | | Snake | | 1,235 |
| | Eldorado | | 16,227 | | Eldorado | | 13,393 |
| | Flambeau | 6,283 | 15,056 | | Flambeau | 7,911 | 17,517 |
| | Solomon | 1,010 | 4,529 | | Solomon | 165 | 1,377 |
| | Sinuk | 6,265 | 15,028 | | Sinuk | 3,650 | 10,537 |
| | Bonanza | 2,113 | 7,357 | | Bonanza | 1,550 | 6,002 |
| | | | <u>66,122</u> | | | | <u>52,076</u> |
| 2013 | Nome | | 4,811 | | | | |
| | Snake | | 2,755 | | | | |
| | Eldorado | | 26,121 | | | | |
| | Flambeau | 16,088 | 27,928 | | | | |
| | Solomon | | 1,377 | | | | |
| | Sinuk | 19,500 | 31,691 | | | | |
| | Bonanza | 5,284 | 13,437 | | | | |
| | | | <u>108,120</u> | | | | |

^a Escapement is estimated by adding Nome, Snake, and Eldorado weir counts and the aerial survey expansion estimates of the other 4 rivers. Aerial survey expansion is calculated as aerial survey count to 0.657142 power multiplied by 48.059 (Clark, 2001), unless otherwise footnoted.

^b Escapement was estimated by counting tower.

^c Because of the lack of aerial survey estimates, method used (from Clark, 2001) was Solomon = 0.368 multiplied by Nome escapement, Sinuk = 1.476 multiplied by Bonanza escapement, and Bonanza = 0.198 multiplied by Eldorado and Flambeau escapements combined.

^d Weir was breached and aerial survey expansion count was used.

Appendix A22.–Historical escapement of salmon and Dolly Varden at Eldorado River counting tower, 1997–2002 and weir, 2003–2013.

| Year | Operating Period | Chinook | Chum | Pink | Coho | Sockeye | Dolly Varden |
|-------------------|------------------|---------|--------|---------|-------|---------|--------------|
| 1997 | June 29–Aug 19 | 98 | 14,302 | 1,022 | 194 | n/a | n/a |
| 1998 | June 29–Aug 12 | 8 | 13,808 | 137,283 | 21 | n/a | n/a |
| 1999 | July 10–Sept 01 | 28 | 4,218 | 977 | 510 | n/a | n/a |
| 2000 | June 29–Aug 25 | 33 | 11,617 | 55,992 | 192 | n/a | n/a |
| 2001 | July 08–Sept 13 | 50 | 11,635 | 488 | 1,509 | n/a | n/a |
| 2002 | June 24–Sept 10 | 26 | 10,215 | 119,098 | 540 | 10 | 377 |
| 2003 | June 21–Sept 08 | 29 | 3,591 | 173 | 115 | 0 | 60 |
| 2004 | June 22–Sept 09 | 25 | 3,277 | 60,866 | 1,151 | 57 | 0 |
| 2005 | June 23–Sept 02 | 32 | 10,369 | 12,356 | 689 | 10 | 23 |
| 2006 | June 26–Aug 03 | 41 | 42,105 | 222,348 | 55 | 1 | 65 |
| 2007 | June 26–Aug 06 | 14 | 21,312 | 833 | 2 | 22 | 60 |
| 2008 | June 27–July 31 | 36 | 6,746 | 244,641 | 38 | 3 | 14 |
| 2009 | July 02–Aug 03 | 31 | 4,943 | 1,119 | 2 | 0 | 72 |
| 2010 ^a | June 30–July 24 | 23 | 42,612 | 48,136 | 2 | 8 | 72 |
| 2011 | June 30–Aug 03 | 3 | 16,227 | 489 | 1 | 0 | 2 |
| 2012 | July 04–Aug 15 | 0 | 13,393 | 59,952 | 1 | 0 | 30 |
| 2013 | July 01–Aug 06 | 9 | 26,121 | 1,025 | 15 | 0 | 2 |

^a Numerous breaches in weir during the season resulted in minimal counts, except for chum salmon count that was determined by aerial survey expansion from the aerial survey count.

Appendix A23.—Historical escapement of salmon and Dolly Varden at Snake River counting tower 1995–2002 and weir 2003–2013.

| Year | Operating Period | Chinook | Chum | Pink | Coho | Sockeye | Dolly Varden |
|------|-----------------------------|---------|--------|---------|------------------|---------|--------------|
| 1995 | July 01–Aug 18 | 0 | 4,393 | 917 | 856 | 0 | NA |
| 1996 | July 03–Aug 22 | 5 | 2,772 | 44,558 | 1,638 | 0 | NA |
| 1997 | July 07–Aug 18 | 12 | 6,184 | 6,742 | 1,157 | 0 | NA |
| 1998 | July 01–Aug 11 | 0 | 11,067 | 219,679 | 178 | 0 | NA |
| 1999 | July 01–Aug 14 | 20 | 484 | 116 | 90 | 0 | NA |
| 2000 | June 29–Aug 25 | 28 | 1,911 | 4,723 | 406 | 0 | NA |
| 2001 | July 08–Sept 05 | 33 | 2,182 | 1,295 | 1,335 | 0 | NA |
| 2002 | June 28–Sept 16 | 9 | 2,776 | 4,103 | 851 ^a | 8 | 149 |
| 2003 | June 26–Sept 11 | 50 | 2,201 | 2,856 | 489 | 84 | 111 |
| 2004 | June 23–Sept 03 | 17 | 2,146 | 126,917 | 474 | 22 | 290 |
| 2005 | June 27–Sept 11 | 31 | 2,967 | 13,813 | 2,948 | 275 | 28 |
| 2006 | July 01–Sept 11 | 32 | 4,160 | 74,028 | 4,776 | 302 | 614 |
| 2007 | July 01–Sept 14 | 61 | 8,147 | 4,634 | 1,781 | 1,354 | 121 |
| 2008 | July 06–Sept 06 | 13 | 1,244 | 145,761 | 5,206 | 143 | 452 |
| 2009 | July 08–Aug 30 ^b | 6 | 891 | 769 | 50 | 2 | 14 |
| 2010 | July 03–Sept 11 | 43 | 6,973 | 51,099 | 2,243 | 124 | 198 |
| 2011 | July 08–Sept 11 | 1 | 4,343 | 7,011 | 343 | 14 | 5 |
| 2012 | July 06–Aug 15 ^c | 1 | 1,235 | 5,954 | 14 | 3 | 3 |
| 2013 | July 19–Sept 10 | 8 | 2,755 | 1,333 | 1,203 | 163 | 1 |

^a Includes 442 coho salmon estimated by aerial survey to be holding below the weir site after the weir was removed.

^b Weir was not fish tight last week of August and hundreds of coho salmon passed through the weir without being counted.

^c Weir was knocked out for 13 days in late July and early August. An interpolation was made for chum salmon.

Appendix A24.–Historical salmon escapement at Kwiniuk River counting tower, 1990–2013.

| Year | Operating Period | Chum | Pink | Chinook | Coho |
|------|------------------|--------|-----------|---------|--------|
| 1990 | June 21–July 25 | 13,957 | 416,512 | 900 | 0 |
| 1991 | June 18–July 27 | 19,801 | 53,499 | 708 | 0 |
| 1992 | June 27–July 28 | 12,077 | 1,464,716 | 479 | 0 |
| 1993 | June 27–July 27 | 15,824 | 43,063 | 600 | 0 |
| 1994 | June 23–Aug 09 | 33,012 | 2,303,114 | 625 | 2,547 |
| 1995 | June 21–July 26 | 42,500 | 17,511 | 498 | 114 |
| 1996 | June 20–July 25 | 28,493 | 907,893 | 577 | 461 |
| 1997 | June 18–July 27 | 20,119 | 9,535 | 974 | 0 |
| 1998 | June 18–July 27 | 24,247 | 655,934 | 303 | 0 |
| 1999 | June 25–July 28 | 8,763 | 607 | 116 | 0 |
| 2000 | June 22–July 27 | 12,879 | 750,173 | 144 | 41 |
| 2001 | June 27–Sept 15 | 16,598 | 8,423 | 261 | 9,532 |
| 2002 | June 17–Sept 11 | 37,995 | 1,114,410 | 778 | 6,459 |
| 2003 | June 15–Sept 15 | 12,123 | 22,329 | 744 | 5,490 |
| 2004 | June 16–Sept 14 | 10,362 | 3,054,684 | 663 | 11,240 |
| 2005 | June 17–Sept 13 | 12,083 | 341,048 | 342 | 12,950 |
| 2006 | June 22–Sept 12 | 39,519 | 1,347,090 | 195 | 22,341 |
| 2007 | June 21–Sept 10 | 27,756 | 54,255 | 258 | 9,429 |
| 2008 | June 23–Sept 07 | 9,483 | 1,444,213 | 237 | 10,461 |
| 2009 | June 24–Sept 13 | 8,739 | 42,962 | 444 | 8,677 |
| 2010 | June 25–Sept 7 | 71,388 | 634,220 | 135 | 8,049 |
| 2011 | June 20–Sept 11 | 31,604 | 30,023 | 57 | 3,288 |
| 2012 | June 23–Aug 16 | 5,577 | 393,302 | 54 | 777 |
| 2013 | June 24–Sept 16 | 5,631 | 13,212 | 15 | 3,940 |

Appendix A25.–Historical salmon escapement at Niukluk River counting tower, 1995–2012.

| Year | Operating Period | Chum | Pink | Chinook | Coho |
|------|------------------|--------|-----------|---------|--------|
| 1995 | June 29–Sept 12 | 86,332 | 17,088 | 123 | 4,713 |
| 1996 | June 23–Sept 12 | 80,178 | 1,154,922 | 243 | 12,781 |
| 1997 | June 28–Sept 09 | 57,305 | 10,468 | 259 | 3,994 |
| 1998 | July 04–Aug 13 | 45,588 | 1,624,438 | 260 | 840 |
| 1999 | July 04–Sept 04 | 35,239 | 20,351 | 40 | 4,260 |
| 2000 | July 04–Aug 27 | 29,573 | 961,603 | 48 | 11,382 |
| 2001 | July 10–Sept 08 | 30,662 | 41,625 | 30 | 3,468 |
| 2002 | June 25–Sept 10 | 35,307 | 645,141 | 621 | 7,391 |
| 2003 | June 25–Sept 10 | 20,018 | 75,855 | 179 | 1,282 |
| 2004 | June 25–Sept 08 | 10,770 | 975,895 | 141 | 2,064 |
| 2005 | June 28–Sept 09 | 25,598 | 270,424 | 41 | 2,727 |
| 2006 | June 26–Sept 08 | 29,199 | 1,371,919 | 39 | 11,169 |
| 2007 | July 01–Sept 04 | 50,994 | 43,617 | 30 | 3,498 |
| 2008 | July 01–Sept 06 | 12,078 | 669,234 | 33 | 13,779 |
| 2009 | July 03–Sept 02 | 15,879 | 24,204 | 204 | 6,861 |
| 2010 | July 01–Sept 01 | 48,561 | 434,205 | 15 | 9,042 |
| 2011 | June 28–Sept 06 | 23,607 | 15,425 | 18 | 2,405 |
| 2012 | July 04–Aug 17 | 19,576 | 249,212 | 21 | 1,729 |

Note: The Niukluk River counting tower project was discontinued after 2012.

Appendix A26.–Historical salmon escapement at Nome River counting tower, 1993–1995, and weir, 1996–2013.

| Year | Operating Period | Chum | Pink | Chinook | Coho | Sockeye |
|------|------------------|-------|---------------------|---------|-------|---------|
| 1993 | July 25–Aug 28 | 1,859 | 13,036 | 63 | 4,349 | |
| 1994 | June 24–Aug 15 | 2,893 | 142,604 | 54 | 726 | |
| 1995 | June 22–Sept 06 | 5,093 | 13,893 | 5 | 1,650 | |
| 1996 | June 26–July 23 | 3,339 | 95,681 ^a | 5 | 66 | |
| 1997 | June 27–Aug 27 | 5,147 | 8,035 | 22 | 321 | |
| 1998 | July 01–Aug 11 | 1,930 | 359,469 | 70 | 96 | |
| 1999 | July 02–Aug 25 | 1,048 | 2,033 | 3 | 417 | 6 |
| 2000 | June 29–Aug 25 | 4,056 | 41,673 | 25 | 698 | 19 |
| 2001 | July 08–Sept 11 | 2,859 | 3,138 | 7 | 2,418 | 55 |
| 2002 | June 29–Sept 11 | 1,720 | 35,057 | 7 | 3,418 | 29 |
| 2003 | July 05–Sept 10 | 1,957 | 11,402 | 12 | 548 | 47 |
| 2004 | June 25–Sept 12 | 3,903 | 1,051,146 | 51 | 2,283 | 114 |
| 2005 | June 27–Sept 11 | 5,584 | 285,759 | 69 | 5,848 | 381 |
| 2006 | July 02–Sept 07 | 5,677 | 578,555 | 43 | 8,308 | 188 |
| 2007 | July 03–Sept 16 | 7,034 | 24,395 | 13 | 2,437 | 534 |
| 2008 | July 02–Sept 17 | 2,607 | 1,186,554 | 28 | 4,605 | 90 |
| 2009 | July 01–Sept 20 | 1,565 | 16,490 | 10 | 1,370 | 103 |
| 2010 | June 30–Sept 16 | 5,906 | 171,760 | 9 | 4,114 | 43 |
| 2011 | July 01–Sept 12 | 3,582 | 14,403 | 12 | 1,833 | 22 |
| 2012 | July 04–Aug 15 | 2,015 | 149,119 | 6 | 224 | 48 |
| 2013 | July 05–Sept 16 | 4,811 | 10,257 | 9 | 2,624 | 38 |

^a In 1996 the majority of pink salmon escaped through the pickets and was not counted.

Appendix A27.–Salmon escapement at Solomon River weir, 2013.

| Year | Operating Period | Chum | Pink | Chinook | Coho | Sockeye |
|------|------------------|-------|-------|---------|------|---------|
| 2013 | July 05–Aug 26 | 1,377 | 2,733 | 0 | 178 | 3 |

Note: The Solomon River weir was initiated in 2013.

Appendix A28.–Historical sockeye salmon escapement at Glacial Lake weir, 2000–2013.

| Year | Operating Period | Chum ^a | Pink ^b | Sockeye |
|-------------------|------------------|-------------------|-------------------|---------|
| 2000 | July 11–July 30 | | | 884 |
| 2001 | July 02–July 28 | 1 | | 2,487 |
| 2002 | June 25–July 26 | | | 1,047 |
| 2003 | June 24–July 28 | | | 2,004 |
| 2004 | June 18–July 25 | 1 | | 8,115 |
| 2005 | June 20–July 25 | | | 11,135 |
| 2006 | July 04–July 18 | | | 6,849 |
| 2007 | July 05–July 20 | | | 4,533 |
| 2008 | June 27–July 28 | 10 | 614 | 1,794 |
| 2009 | June 20–July 27 | | | 826 |
| 2010 | June 26–July 28 | | | 1,047 |
| 2011 | June 28–July 26 | 4 | | 1,697 |
| 2012 ^c | July 01–Aug 09 | 25 | 165 | 1,636 |
| 2013 ^d | June 20–Aug 12 | 35 | 2 | 2,544 |

^a Chum salmon will pass upstream through the Glacial Lake weir and often exit the lake back downstream through the weir.

^b Pink salmon have been observed often in even-numbered years, but 2008 was the first year the crew was instructed to enumerate pink salmon passage.

^c A video project was tested during 2012 and was in operation 11 days (July 31 to August 9) after human occupation of the weir site. Included in totals are 34 sockeye, 12 pink, and 10 chum salmon that were counted by camera during that time.

^d A video project was in operation from July 14 to August 12.

Appendix A29.–Historical salmon escapement at Inglutalik River counting tower, 2011–2013.

| Year | Operating Period | Chum | Pink | Chinook | Coho |
|------|------------------|--------|---------|---------|-------|
| 2011 | June 24–Aug 14 | 64,892 | 494,099 | 1,467 | 870 |
| 2012 | June 23–Aug 23 | 32,832 | 90,349 | 1,134 | 1,431 |
| 2013 | June 21–Aug 11 | 61,259 | 268,537 | 860 | 5,904 |

Note: Due to speciation problems in 2013, the Chinook and coho counts are probably inaccurate.

Appendix A30.–Historical salmon escapement at North River counting tower, 1996–2013.

| Year | Operating Period | Chum | Pink | Chinook | Coho |
|------|------------------|--------|-----------|---------|--------|
| 1996 | June 16–July 25 | 9,789 | 332,539 | 1,197 | 1,229 |
| 1997 | June 16–Aug 21 | 6,904 | 127,926 | 4,185 | 5,768 |
| 1998 | June 15–Aug 12 | 1,526 | 74,045 | 2,100 | 3,361 |
| 1999 | June 30–Aug 31 | 5,600 | 48,993 | 1,639 | 4,792 |
| 2000 | June 17–Aug 12 | 4,971 | 69,703 | 1,046 | 6,959 |
| 2001 | July 05–Sept 15 | 6,515 | 24,737 | 1,337 | 12,383 |
| 2002 | June 19–Aug 29 | 5,918 | 321,756 | 1,484 | 2,966 |
| 2003 | June 15–Sept 13 | 9,859 | 280,212 | 1,452 | 5,837 |
| 2004 | June 15–Sept 14 | 10,036 | 1,162,978 | 1,125 | 11,187 |
| 2005 | June 15–Sept 15 | 11,984 | 1,670,934 | 1,015 | 19,189 |
| 2006 | June 18–Sept 11 | 5,385 | 2,169,890 | 906 | 9,835 |
| 2007 | June 16–Sept 05 | 8,151 | 580,935 | 1,948 | 19,965 |
| 2008 | June 19–Sept 13 | 9,502 | 240,286 | 903 | 15,648 |
| 2009 | June 19–Sept 11 | 9,783 | 190,291 | 2,355 | 22,276 |
| 2010 | June 19–Sept 07 | 16,131 | 150,807 | 1,256 | 7,608 |
| 2011 | June 17–Sept 08 | 19,898 | 123,892 | 864 | 3,624 |
| 2012 | June 21–Aug 19 | 9,120 | 137,006 | 996 | 3,258 |
| 2013 | July 01–Aug 05 | 10,518 | 46,668 | 564 | 8,834 |

Appendix A31.–Historical salmon escapement at Unalakleet River weir, 2010–2013.

| Year | Operating Period | Chum | Pink | Chinook | Coho | Sockeye |
|------|------------------|---------|---------|---------|--------|---------|
| 2010 | June 22–July 31 | 70,811 | 832,904 | 1,021 | 5,382 | 130 |
| 2011 | June 17–Aug 07 | 108,770 | 363,906 | 1,111 | 10,418 | 190 |
| 2012 | June 24–Aug 15 | 70,669 | 672,083 | 807 | 17,766 | 245 |
| 2013 | June 20–Aug 22 | 113,953 | 144,225 | 767 | 25,566 | 243 |

Appendix A32.–Chum salmon escapement by river, Nome Subdistrict, 1993–2013.

| Year | Rivers West of Cape Nome | | | Rivers East of Cape Nome | | | | Total ^e |
|-------|--------------------------|--------------------|-------------------|--------------------------|-----------------------|----------------------|----------------------|--------------------|
| | Sinuk ^a | Snake ^b | Nome ^c | Flambeau ^a | Eldorado ^d | Bonanza ^a | Solomon ^a | |
| 1993 | 6,052 | 2,115 | 5,925 | 6,103 | 9,048 | 3,007 | 2,525 | 34,775 |
| 1994 | 4,905 | 3,519 | 2,893 | 12,889 | 13,202 | 5,178 | 1,066 | 43,652 |
| 1995 | 9,464 | 4,395 | 5,093 | 16,474 | 18,955 | 11,182 | 2,106 | 67,669 |
| 1996 | 6,658 | 2,772 | 3,339 | 13,613 | 32,970 | 7,049 | 2,141 | 68,542 |
| 1997 | 9,212 | 6,184 | 5,147 | 9,455 | 14,302 | 4,140 | 2,111 | 50,551 |
| 1998 | 6,720 | 11,067 | 1,930 | 9,129 | 13,808 | 4,552 | 925 | 48,131 |
| 1999 | 6,370 | 484 | 1,048 | 637 | 4,218 | 2,304 | 637 | 15,698 |
| 2000 | 7,198 | 1,911 | 4,056 | 3,947 | 11,617 | 4,876 | 1,294 | 34,899 |
| 2001 | 10,718 | 2,182 | 2,859 | 10,465 | 11,635 | 4,745 | 1,949 | 44,553 |
| 2002 | 6,333 | 2,776 | 1,720 | 6,804 | 10,243 | 3,199 | 2,150 | 33,225 |
| 2003 | 3,482 | 2,201 | 1,957 | 3,380 | 3,591 | 1,664 | 806 | 17,081 |
| 2004 | 3,197 | 2,145 | 3,903 | 7,667 | 3,273 | 2,166 | 1,436 | 23,787 |
| 2005 | 4,710 | 2,948 | 5,584 | 7,692 | 10,426 | 5,534 | 1,914 | 38,808 |
| 2006 | 4,834 | 4,128 | 5,677 | 27,828 | 41,985 | 708 | 2,062 | 87,222 |
| 2007 | 16,481 | 8,147 | 7,034 | 12,006 | 21,312 | 8,491 | 3,469 | 76,940 |
| 2008 | 5,367 | 1,244 | 2,607 | 11,618 | 6,746 | 3,636 | 959 | 32,177 |
| 2009 | 2,232 | 891 | 1,565 | 4,075 | 4,943 | 6,744 | 918 | 21,368 |
| 2010 | 11,107 | 6,973 | 5,906 | 25,009 | 42,612 | 3,513 | 2,678 | 97,798 |
| 2011 | 15,028 | 4,343 | 3,582 | 15,056 | 16,227 | 7,357 | 4,529 | 66,122 |
| 2012 | 10,537 | 1,235 | 2,015 | 17,517 | 13,393 | 6,002 | 1,377 | 52,076 |
| 2013 | 31,691 | 2,755 | 4,811 | 27,928 | 26,121 | 13,437 | 1,377 | 108,120 |
| Total | 182,296 | 74,415 | 78,651 | 249,292 | 330,627 | 109,484 | 38,429 | 1,063,194 |

^a Sinuk, Flambeau, Bonanza, and Solomon rivers' escapements are estimated by aerial survey, but in 2013, Solomon River escapement was a weir count.

^b Snake River escapements are estimated by aerial survey (1993–1994), tower counts (1995–2002), and weir counts (2003–2012). Escapement goal range is 1,600–2,500 chum salmon.

^c Nome River escapements are estimated by aerial survey expansion (1993), tower counts (1994–1995), and weir counts (1996–2012). Escapement goal range is 2,900–4,300 chum salmon.

^d Eldorado River escapements are estimated by aerial survey (1993–1996), tower counts (1997–2002), and weir counts (2003–2012). Escapement goal range is 6,000–9,200 chum salmon.

^e Subdistrict 1 BEG is 23,000–35,000 chum salmon.

Appendix A33.–Pink salmon escapement by year and river, Nome Subdistrict, 1993–2013.

| Year | Rivers West of Cape Nome | | | Rivers East of Cape Nome | | | | Total |
|-------|--------------------------|--------------------|-------------------|--------------------------|-----------------------|----------------------|----------------------|------------|
| | Sinuk ^a | Snake ^b | Nome ^c | Flambeau ^a | Eldorado ^d | Bonanza ^a | Solomon ^a | |
| 1993 | 5,120 | | 13,036 | 5,584 | 120 | ND | ND | 23,860 |
| 1994 | 492,100 | 63,860 | 142,604 | 19,202 | 53,890 | 20 | ND | 771,676 |
| 1995 | 1,250 | 917 | 13,893 | 8,086 | 4,243 | 619 | 350 | 29,358 |
| 1996 | 74,400 | 44,558 | 95,681 | 17,182 | 46,100 | 40,510 | 15,230 | 333,661 |
| 1997 | 1,200 | 6,742 | 8,035 | 2,117 | 1,022 | ND | 80 | 19,196 |
| 1998 | 342,100 | 219,679 | 359,469 | 8,720 | 137,283 | 167,130 | 45,175 | 1,279,556 |
| 1999 | 180 | 116 | 2,033 | 1,251 | 977 | 245 | 90 | 4,892 |
| 2000 | 12,175 | 4,723 | 41,673 | 2,159 | 55,992 | 12,410 | 2,899 | 132,031 |
| 2001 | 115 | 1,295 | 3,138 | 924 | 488 | 221 | ND | 6,181 |
| 2002 | 28,487 | 4,103 | 35,057 | 2,233 | 119,098 | 17,095 | 9,170 | 215,243 |
| 2003 | 9,907 | 2,856 | 11,402 | 194 | 173 | 1,540 | 157 | 26,229 |
| 2004 | 1,267,100 | 126,917 | 1,051,146 | 7,351 | 60,866 | 185,000 | 109,000 | 2,807,380 |
| 2005 | 211,285 | 13,813 | 285,759 | 873 | 12,356 | 55,000 | 11,100 | 590,186 |
| 2006 | 515,000 | 74,028 | 578,555 | 6,556 | 222,348 | 268,500 | 165,215 | 1,830,202 |
| 2007 | 6,810 | 4,634 | 24,395 | 336 | 833 | 1,360 | 2,400 | 40,768 |
| 2008 | 1,496,000 | 145,761 | 1,186,554 | 3,510 | 244,641 | 212,000 | 81,000 | 3,369,466 |
| 2009 | 6,740 | 769 | 16,490 | 175 | 1,119 | 3,276 | 1,565 | 30,134 |
| 2010 | 168,600 | 51,099 | 171,760 | 4,797 | 48,136 | 106,000 | 21,804 | 572,196 |
| 2011 | 21,100 | 7,011 | 14,403 | 58 | 489 | 11,050 | 5,580 | 59,691 |
| 2012 | 506,500 | 5,954 | 149,119 | 2,657 | 59,318 | 54,700 | 15,000 | 793,248 |
| 2013 | 143,921 | 1,333 | 10,257 | ND | 1,025 | 800 | 2,733 | 160,069 |
| Total | 5,310,090 | 780,168 | 4,214,459 | 93,965 | 1,070,517 | 1,137,476 | 488,548 | 13,095,223 |

^a Sinuk, Flambeau, Bonanza, and Solomon rivers' escapements are estimated by aerial survey, but in 2013, Solomon River escapement was a weir count.

^b Snake River escapements are estimated by aerial survey (1993–1994), tower counts (1995–2002), and weir counts (2003–2013).

^c Nome River escapements are estimated by tower counts (1993–1995) and weir counts (1996–2013). Escapement goal range is 13,000 pink salmon in even-numbered years and 3,200 pink salmon in odd-numbered years.

^d Eldorado River escapements are estimated by aerial survey (1993–1996), tower counts (1997–2002), and weir counts (2003–2013).

Appendix A34.—Number of customary trade permits issued, Norton Sound District and Port Clarence District, 2007–2013.

| Year | Norton Sound District | | | | | | | Port Clarence District | | | Value | |
|------|-----------------------|---------|------|-------|------------|------------|-------------|------------------------|--------|-------------------|-------|--------------|
| | Nome | Golovin | Elim | Koyuk | Shaktoolik | Unalakleet | St. Michael | Stebbins | Teller | Brevig Mission | | Wales |
| 2007 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | \$200.00 |
| 2008 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | \$0.00 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Confidential |
| 2010 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Confidential |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | Confidential |
| 2012 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Confidential |
| 2013 | 4 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 6 | 0 | \$1,790.00 |

APPENDIX B: PORT CLARENCE FISHERIES

Appendix B1.—Comparative sockeye salmon aerial survey indices, Port Clarence District, 1990–2013.

| Year | Salmon Lake | Grand Central River | Total |
|------|----------------|------------------------|--------|
| 1990 | 2,834 | 926 | 3,760 |
| 1991 | 3,790 | 1,570 | 5,360 |
| 1992 | 1,500 | ^a | 1,500 |
| 1993 | 2,885 | 216 | 3,092 |
| 1994 | 3,740 | 1,230 | 4,970 |
| 1995 | 5,433 | 628 ^b | 6,061 |
| 1996 | 6,610 | 770 | 7,380 |
| 1997 | 8,760 | 1,520 | 10,280 |
| 1998 | 5,210 | 1,977 | 7,187 |
| 1999 | 31,720 | 1,780 | 33,500 |
| 2000 | 12,772 | ^a | 12,772 |
| 2001 | 9,400 | 155 | 9,555 |
| 2002 | 3,520 | 71 | 3,591 |
| 2003 | 19,275 | 1,015 | 20,290 |
| 2004 | 23,005 | 2,855 | 25,860 |
| 2005 | 41,500 | 740 | 42,240 |
| 2006 | 39,400 | 2,380 | 41,780 |
| 2007 | 14,920 | 5,692 | 20,612 |
| 2008 | 9,420 | 2,252 | 11,672 |
| 2009 | 136 | 50 | 186 |
| 2010 | 73 | 711 | 784 |
| 2011 | 4,604 | 540 | 5,144 |
| 2012 | 4,730 | 1,100 | 5,830 |
| 2013 | 5,820 | 1,151 | 6,971 |

^a No survey occurred.

^b Early count.

Appendix B2.—Historical escapement of salmon and Dolly Varden at Pilgrim River counting tower (1997–2002) and weir (2003–2013).

| Year | Operating Period | Chinook | Chum | Pink | Coho | Sockeye | Dolly Varden |
|------|------------------|---------|---------------------|--------|--------------------|---------------------|--------------|
| 1997 | July 12–Aug 21 | 356 | 15,619 ^a | 5,557 | 452 | 15,619 ^a | NA |
| 1998 | Did not operate | | | | | | |
| 1999 | July 13–Aug 06 | 6 | 2,617 | 35,577 | 104 | 4,650 | NA |
| 2000 | July 05–Aug 18 | 72 | 861 | 374 | 21 | 12,141 | NA |
| 2001 | Did not operate | | | | | | |
| 2002 | July 04–Aug 04 | 150 | 5,590 | 3,882 | 246 | 3,888 | NA |
| 2003 | June 21–Sept 14 | 1,016 | 15,200 | 14,100 | 677 | 42,729 | 550 |
| 2004 | June 21–Sept 14 | 925 | 10,239 | 50,760 | 1,573 ^b | 85,417 | 264 |
| 2005 | June 24–Sept 05 | 216 | 9,685 | 13,218 | 304 | 55,951 | 112 |
| 2006 | June 30–Sept 09 | 275 | 45,361 | 17,701 | 973 | 52,323 | 505 |
| 2007 | June 29–Sept 10 | 501 | 35,334 | 3,616 | 605 | 43,432 | 339 |
| 2008 | June 25–Sept 01 | 137 | 24,550 | 92,471 | 260 | 20,452 | 409 |
| 2009 | June 26–Aug 31 | 52 | 5,427 | 483 | 18 | 953 | 130 |
| 2010 | June 24–Sept 01 | 44 | 25,379 | 29,239 | 272 | 1,654 | 285 |
| 2011 | June 28–Sept 01 | 44 | 41,740 | 3,364 | 269 | 8,449 | 229 |
| 2012 | June 26–Aug 18 | 64 | 25,521 | 46,135 | 95 | 7,085 | 65 |
| 2013 | June 27–Sept 08 | 47 | 47,557 | 1,060 | 890 | 12,428 | 27 |

^a Chum and sockeye salmon escapements were combined due to species identification problems during 1997.

^b Coho salmon were misidentified. Nearly 30% of scale samples in 2004 were actually sockeye salmon.

Appendix B3.—Estimated number of subsistence fishing families and harvest in Port Clarence District, 1994–2013.

| Year | Number of fishing families interviewed | Chinook | Sockeye | Coho | Pink | Chum | Total |
|---------------------|--|---------|---------|-------|-------|-------|--------|
| 1994 ^a | 127 | 203 | 2,220 | 1,892 | 4,309 | 2,294 | 10,918 |
| 1995 ^a | 122 | 76 | 4,481 | 1,739 | 3,293 | 6,011 | 15,600 |
| 1996 ^a | 117 | 194 | 2,634 | 1,258 | 2,236 | 4,707 | 11,029 |
| 1997 ^a | 126 | 158 | 3,177 | 829 | 755 | 2,099 | 7,018 |
| 1998 ^a | 138 | 289 | 1,696 | 1,759 | 7,815 | 2,621 | 14,180 |
| 1999 ^a | 155 | 89 | 2,392 | 1,030 | 786 | 1,936 | 6,233 |
| 2000 ^a | 134 | 72 | 2,851 | 935 | 1,387 | 1,275 | 6,520 |
| 2001 ^a | 160 | 84 | 3,692 | 1,299 | 1,183 | 1,910 | 8,168 |
| 2002 ^a | 159 | 133 | 3,732 | 2,194 | 3,394 | 2,699 | 12,152 |
| 2003 ^{a,b} | 204 | 177 | 4,495 | 1,434 | 4,113 | 2,430 | 12,649 |
| 2004 ^c | 376 ^d | 278 | 8,688 | 1,131 | 5,918 | 2,505 | 18,520 |
| 2005 ^c | 335 ^d | 152 | 8,492 | 726 | 6,615 | 2,479 | 18,464 |
| 2006 ^c | 345 ^d | 102 | 9,940 | 1,061 | 4,939 | 4,353 | 20,395 |
| 2007 ^c | 363 ^d | 85 | 9,484 | 705 | 1,468 | 4,454 | 16,196 |
| 2008 ^c | 408 ^d | 125 | 5,069 | 512 | 7,527 | 2,449 | 15,682 |
| 2009 ^c | 326 ^d | 40 | 1,643 | 804 | 1,882 | 3,060 | 7,429 |
| 2010 ^c | 290 ^d | 63 | 824 | 596 | 5,202 | 5,232 | 11,917 |
| 2011 ^c | 267 ^d | 57 | 1,611 | 393 | 2,610 | 4,338 | 9,008 |
| 2012 ^c | 335 ^d | 44 | 1,422 | 703 | 5,200 | 7,802 | 15,171 |
| 2013 ^c | 431 ^d | 38 | 5,243 | 651 | 1,788 | 6,588 | 14,308 |

^a Harvest estimate from ADF&G Division of Subsistence survey.

^b Includes harvest reported from 59 Pilgrim River permits. In total, 101 permits were issued and 79 were returned.

^c Beginning in 2004 a permit was required for Port Clarence District (including Pilgrim River and Salmon Lake) that replaced household surveys.

^d The number is all permits issued for the Port Clarence District (including Pilgrim River and Salmon Lake permits).

Appendix B4.–Application of 20-05-00 liquid blend of phosphorous and nitrogen fertilizer to Salmon Lake, 1997–2013.

| Year | Fertilizer (tons) | Organization |
|------|-------------------|-----------------|
| 1997 | 40 | NSEDC/ADF&G/BLM |
| 1998 | 40 | NSEDC/ADF&G/BLM |
| 1999 | 40 | NSEDC/ADF&G/BLM |
| 2000 | 40 | NSEDC/ADF&G/BLM |
| 2001 | 40 | NSEDC/ADF&G/BLM |
| 2002 | 0 | |
| 2003 | 0 | |
| 2004 | 27 | NSEDC/ADF&G |
| 2005 | 0 | |
| 2006 | 0 | |
| 2007 | 16 | NSEDC |
| 2008 | 8 | NSEDC |
| 2009 | 28 | NSEDC |
| 2010 | 19 | NSEDC |
| 2011 | 11 | NSEDC |
| 2012 | 10 | NSEDC |
| 2013 | 10 | NSEDC |

APPENDIX C: KOTZEBUE FISHERIES

Appendix C1.–Kotzebue District chum salmon catch statistics, 1990–2013.

| Year | Total Catch | Number of fishermen | Season catch per fisherman |
|-------------------|-------------|---------------------|----------------------------|
| 1990 | 163,263 | 153 | 1,067 |
| 1991 | 239,923 | 142 | 1,690 |
| 1992 | 289,184 | 149 | 1,941 |
| 1993 ^a | 73,071 | 114 | 641 |
| 1994 | 153,452 | 109 | 1,408 |
| 1995 | 290,730 | 92 | 3,160 |
| 1996 | 82,110 | 55 | 1,493 |
| 1997 | 142,720 | 68 | 2,099 |
| 1998 | 55,907 | 45 | 1,242 |
| 1999 | 138,605 | 60 | 2,310 |
| 2000 | 159,802 | 64 | 2,497 |
| 2001 | 211,672 | 66 | 3,207 |
| 2002 | 8,390 | 3 | 2,797 |
| 2003 | 25,423 | 4 | 6,356 |
| 2004 | 51,038 | 43 | 1,187 |
| 2005 | 75,971 | 41 | 1,853 |
| 2006 | 137,961 | 42 | 3,285 |
| 2007 | 147,087 | 46 | 3,198 |
| 2008 | 190,550 | 48 | 3,970 |
| 2009 | 187,562 | 62 | 3,025 |
| 2010 | 270,343 | 67 | 4,035 |
| 2011 | 264,225 | 89 | 2,970 |
| 2012 | 227,965 | 83 | 2,747 |
| 2013 | 319,062 | 66 | 4,834 |
| Avg 1990–2012 | 155,955 | 72 | 2,529 |

^a Includes 2,000 chum salmon from the Sikusuilaq Springs Hatchery terminal fishery.

Appendix C2.–Kotzebue District chum salmon type of processing and weights, 1990–2013.

| Year | Chum salmon (pounds) | Other ^a | Fresh frozen salmon roe (pounds) |
|-------------------|-------------------------|--------------------|--|
| 1990 | 1,453,040 | 538 | |
| 1991 | 1,951,041 | 714 | |
| 1992 | 2,397,302 | 2,714 | |
| 1993 ^b | 613,968 | 1,507 | 1,000 |
| 1994 ^c | 1,166,494 | 73 | |
| 1995 | 2,329,898 | 93 | |
| 1996 ^d | 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 | |
| 2005 | 621,573 | 1,258 | |
| 2006 | 1,040,023 | 0 | |
| 2007 | 1,209,842 | 0 | |
| 2008 | 1,541,922 | 0 | |
| 2009 | 1,505,734 | 0 | |
| 2010 | 2,160,264 | 0 | |
| 2011 | 2,158,365 | 0 | |
| 2012 | 1,751,473 | 0 | |
| 2013 | 2,555,304 | 0 | |

Note: Data not available for all years.

^a Chinook and pink salmon, and Dolly Varden.

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

^c Includes 31,500 pounds commercially caught but not reported on fish tickets.

^d Includes 17,600 pounds commercially caught but not sold on fish tickets.

Appendix C3.—Kotzebue District mean prices paid per pound in dollars to salmon fishermen by species, 1990–2013.

| Year | Chum salmon | | Chinook salmon | Inconnu | Dolly Varden |
|-------------------|----------------|---------------|----------------|---------|--------------|
| | Average weight | Average price | | | |
| 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 ^a | 8.0 | 0.15 | 1.00 | | 0.20 |
| 1999 ^a | 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 | 0.00 | | |
| 2003 | 8.6 | 0.12 | 0.00 | | 0.50 |
| 2004 | 8.2 | 0.15 | 0.72 | | 0.26 |
| 2005 | 8.2 | 0.20 | 0.50 | | 0.30 |
| 2006 | 7.5 | 0.22 | | | |
| 2007 | 8.2 | 0.20 | | | |
| 2008 | 8.1 | 0.25 | | | |
| 2009 | 8.0 | 0.25 | | | |
| 2010 | 8.0 | 0.40 | | | |
| 2011 | 8.2 | 0.40 | | | |
| 2012 | 7.7 | 0.32 | | | |
| 2013 | 8.0 | 0.27 | | | |

Note: Information is not available for some species in some years.

^a Each chum salmon was assumed to weigh 8 pounds, but no fish were weighed individually.

Appendix C4.–Kotzebue District commercial fishery dollar value estimates, 1990–2013.

| Year | Gross value of catch to fishermen ^a | Number of fishermen | Average value per fisherman |
|-------------------|--|---------------------|-----------------------------|
| 1990 | \$438,044 | 153 | \$2,863 |
| 1991 | \$437,948 | 142 | \$3,084 |
| 1992 | \$533,731 | 149 | \$3,582 |
| 1993 ^b | \$235,061 | 114 | \$2,062 |
| 1994 | \$233,512 | 109 | \$2,142 |
| 1995 | \$316,031 | 92 | \$3,435 |
| 1996 | \$56,310 | 55 | \$1,024 |
| 1997 | \$187,978 | 68 | \$2,764 |
| 1998 | \$70,587 | 45 | \$1,569 |
| 1999 | \$179,781 | 60 | \$2,996 |
| 2000 | \$246,786 | 64 | \$3,856 |
| 2001 | \$322,650 | 66 | \$4,889 |
| 2002 | \$7,572 | 3 | \$2,524 |
| 2003 | \$26,377 | 4 | \$6,594 |
| 2004 | \$64,420 | 43 | \$1,498 |
| 2005 | \$124,820 | 41 | \$3,044 |
| 2006 | \$229,086 | 42 | \$5,454 |
| 2007 | \$243,149 | 46 | \$5,286 |
| 2008 | \$385,270 | 48 | \$8,026 |
| 2009 | \$376,554 | 62 | \$6,073 |
| 2010 | \$860,125 | 67 | \$12,838 |
| 2011 | \$867,085 | 89 | \$9,743 |
| 2012 | \$567,664 | 83 | \$6,839 |
| 2013 | \$689,163 | 66 | \$10,442 |
| Avg 1990–2012 | \$304,806 | 72 | \$4,443 |

^a Values represent chum salmon value and incidental species such as char, whitefish, and other salmon.

^b Includes \$3,648 from Sikusuilaq Springs Hatchery terminal fishery.

Appendix C5.–Kotzebue District commercial (1990–2013) and subsistence salmon catches (1990–2004 and 2012–2013).

| Year | Commercial catch | | | Subsistence catch | | | Total documented catch |
|------------------|----------------------|--------------------|---------|---|---------------------------------|-----------------------------|------------------------|
| | Chum | Other ^a | Total | Chum | Number of fishermen interviewed | Average catch per fisherman | |
| 1990 | 163,263 | 32 | 163,295 | 8,268 | b | b | 163,295 |
| 1991 | 239,923 | 44 | 239,967 | 14,740 | b | b | 239,967 |
| 1992 | 289,184 | 204 | 289,388 | 14,303 | b | b | 289,388 |
| 1993 | 73,071 ^c | 131 | 131 | 15,430 | b | b | 131 |
| 1994 | 153,452 ^d | 3 | 3 | 36,226 ^e | 375 | 97 | 36,229 |
| 1995 | 290,730 | 5 | 290,735 | 102,881 | 593 | 173 | 393,616 |
| 1996 | 82,110 ^f | 3 | 3 | 99,740 | 596 | 167 | 99,743 |
| 1997 | 142,720 | 45 | 142,765 | 57,906 | 530 | 109 | 200,671 |
| 1998 | 55,907 | 210 | 56,117 | 48,980 | 592 | 83 | 105,097 |
| 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 ^{e,g} | 191 | 88 | 25,270 |
| 2003 | 25,423 | 0 | 25,423 | 19,201 ^e | 446 | 43 | 44,624 |
| 2004 | 51,038 | 116 | 51,154 | 24,637 ^e | 440 | 63 | 75,791 |
| 2005 | 75,971 | 7 | 75,978 | Subsistence surveys were not conducted. | | | |
| 2006 | 137,961 | 17 | 137,978 | Subsistence surveys were not conducted. | | | |
| 2007 | 147,087 | 20 | 147,107 | Subsistence surveys were not conducted. | | | |
| 2008 | 190,550 | 742 | 191,292 | Subsistence surveys were not conducted. | | | |
| 2009 | 187,562 | 106 | 187,668 | Subsistence surveys were not conducted. | | | |
| 2010 | 270,343 | 583 | 270,926 | Subsistence surveys were not conducted. | | | |
| 2011 | 264,321 | 166 | 264,487 | Subsistence surveys were not conducted. | | | |
| 2012 | 227,965 | 476 | 228,441 | 26,693 ^e | 360 | 74 | 255,134 |
| 2013 | 319,062 | 114 | 319,176 | Information is not yet available. | | | |
| Average 2003–'12 | 157,822 | 223 | 158,045 | Average 1995–'04 | 457 | 127 | 166,498 |

^a Includes Chinook, pink, and sockeye salmon that were not sold but retained for personal use.

^b Information not available.

^c Includes 2,000 chum salmon from the Sikusuilq Springs Hatchery terminal fishery.

^d Includes 4,000 chum salmon commercially harvested on August 5 but not sold.

^e Does not include the town of Kotzebue.

^f Includes 2,200 chum salmon commercially harvested on July 29 but not sold.

^g Only 2 of 6 villages surveyed.

Appendix C6.–Kotzebue District subsistence chum salmon catches by village, 1990–2004 and 2012–2013.

| Year | Village | | | | | Kobuk | Noatak | Village | | | | | District Total |
|------|-----------------------------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| | Noorvik | Kiana | Ambler | Shungnak | Kobuk | River Villages | Village | Kotzebue | Deering | Kivalina | Buckland | Shishmaref | |
| 1990 | 4,353 | ^a | ^a | ^a | ^a | 4,353 | 3,915 | ^a | ^a | ^a | ^a | ^a | 8,268 |
| 1991 | 6,855 | ^a | ^a | 4,248 | ^a | 11,103 | 3,637 | ^a | ^a | ^a | ^a | ^a | 14,740 |
| 1992 | 8,370 | ^a | ^a | 3,890 | ^a | 12,260 | 2,043 | ^a | ^a | ^a | ^a | ^a | 14,303 |
| 1993 | 8,430 | ^a | ^a | 3,730 | ^a | 12,160 | 3,270 | ^a | ^a | ^a | ^a | ^a | 15,430 |
| 1994 | 8,157 | 1,891 | 2,860 | 7,982 | 5,722 | 26,612 | 6,126 | ^a | 3,488 | ^a | ^a | ^a | 36,226 |
| 1995 | 15,485 | 5,985 | 8,558 | 5,880 | 2,959 | 38,867 | 6,359 | 50,708 | ^a | ^a | ^a | 6,947 | 102,881 |
| 1996 | 13,611 | 5,935 | 9,062 | 8,649 | 1,819 | 39,076 | 10,091 | 50,573 | ^a | ^a | ^a | ^a | 99,740 |
| 1997 | 14,323 | 3,064 | 2,713 | 5,513 | 629 | 26,242 | 5,309 | 26,355 | ^a | ^a | ^a | ^a | 57,906 |
| 1998 | 9,845 | 3,414 | 2,432 | 4,676 | 1,031 | 21,398 | 2,614 | 24,968 | ^a | ^a | ^a | ^a | 48,980 |
| 1999 | 17,843 | 3,788 | 590 | 3,868 | 1,869 | 27,958 | 1,616 | 64,768 | ^a | ^a | ^a | ^a | 94,342 |
| 2000 | 10,391 | 2,876 | 5,009 | 2,944 | 318 | 21,538 | 7,293 | 37,144 | ^a | ^a | ^a | ^a | 65,975 |
| 2001 | 16,540 | 5,500 | ^a | 4,310 | 2,843 | 29,193 | 2,326 | 17,713 | ^a | ^a | ^a | ^a | 49,232 |
| 2002 | 13,943 | ^b | ^b | ^b | ^b | ^b | ^b | ^b | ^a | ^a | ^a | ^a | 16,880 |
| 2003 | 7,982 | 3,010 | 1,719 | 2,860 | 1,453 | 17,024 | 2,177 | ^a | ^a | ^a | ^a | ^a | 19,201 |
| 2004 | 6,025 | 3,896 | 3,446 | 4,186 | 3,087 | 20,640 | 3,997 | ^a | ^a | ^a | ^a | ^a | 24,637 |
| 2012 | 9,584 | 2,442 | 1,621 | 2,595 | 2,637 | 18,879 | 7,814 | ^a | ^a | ^a | ^a | ^a | |
| 2013 | Information is not yet available. | | | | | | | | | | | | |

Note: No subsistence surveys were conducted from 2005 to 2011. Kotzebue area villages were surveyed by the Division of Subsistence in 2012 and 2013, but data are not yet available for 2013.

^a Not surveyed.

^b The Kotzebue Sound communities of Ambler, Kiana, Kobuk, Kotzebue, and Shungnak, although normally included, were not surveyed in 2002 (Georgette et al. 2003).

Appendix C7.–Kotzebue District average subsistence chum salmon harvest per household by village, 1990–2004 and 2012–2013.

| Year | Kotzebue | Noatak | Noorvik | Kiana | Ambler | Shungnak | Kobuk | Deering |
|------|--------------|-----------------------------------|---------|--------------|--------------|--------------|--------------|--------------|
| 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 | ^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 | 78 | 18 | 151 | 42 | 8 | 76 | 81 | ^a |
| 2000 | 48 | 72 | 93 | 33 | 72 | 64 | 11 | ^a |
| 2001 | 23 | 24 | 152 | 62 | ^a | 94 | 109 | ^a |
| 2002 | ^a | 29 | 121 | ^a | ^a | ^a | ^a | ^a |
| 2003 | ^a | 21 | 58 | 32 | 26 | 57 | 43 | ^a |
| 2004 | ^a | 50 | 56 | 46 | 56 | 75 | 111 | ^a |
| - | - | - | - | - | - | - | - | - |
| 2012 | ^a | 94 | 115 | 38 | 31 | 56 | 88 | ^a |
| 2013 | ^a | Information is not yet available. | | | | | | ^a |

Note: No subsistence surveys were conducted from 2005 to 2011.

^a Not surveyed.

Appendix C8.–Kotzebue District chum salmon aerial survey counts, 1990–2009.

| Stream ^a | 1990 ^b | 1991 ^b | 1992 ^b | 1993 | 1994 ^c | 1995 | 1996 | 1997 | 1998 | 1999 |
|-------------------------------------|---------------------|-------------------|-------------------|--------|-------------------|---------|----------------------|--------------------|--------------|--------|
| Noatak Drainage | | | | | | | | | | |
| Noatak River below Kelly River | 23,345 ^b | 82,750 | 34,335 | 25,415 | | 147,260 | 306,900 ^c | ^c | ^b | |
| Eli River | 3,000 | 2,940 | 701 | 4,795 | | 7,860 | 30,040 ^c | ^c | ^b | |
| Kelly River and Lake | 325 ^d | 654 | 726 | 9 | | 8,384 | 1,427 | 2,792 | 2,631 | |
| Noatak River System Total | 26,670 | 86,344 | 35,762 | 30,219 | | 163,504 | 338,367 | | ^b | 84,085 |
| Kobuk Drainage | | | | | | | | | | |
| Kobuk to Pah River | 4,610 | 9,840 | 1,030 | 3,896 | | 12,190 | 20,700 | 2,248 ^b | ^b | |
| Pah River to just below Selby River | 305 | 2,780 | 3,820 | 1,535 | | 4,537 | 4,600 | 404 ^b | ^b | |
| Selby River mouth & slough | 420 | 1,040 | 1,500 | 1,800 | | 1,250 | 4,100 | 662 ^b | ^b | |
| Selby River | 7,505 | 1,460 | 868 | 824 | | 3,364 | 14,950 | 853 ^b | | 730 |
| Selby River mouth to Beaver Creek | | 5,250 | 3,845 | 929 | | 10,898 | 15,480 | 2,582 ^b | | |
| Beaver Creek mouth | 2,515 | | | | | | | 914 ^b | ^b | |
| Above Beaver Creek | | 4,155 | 740 | 3,174 | | 3,486 | 14,940 | 850 ^b | ^b | |
| Upper Kobuk River Total | 15,355 | 24,525 | 11,803 | 12,158 | | 35,725 | 74,770 | 8,513 ^b | ^b | 27,340 |
| Squirrel River | 5,500 | 4,606 | 2,765 | 4,463 | | 10,605 | 10,740 | 4,779 ^b | | 13,513 |
| Salmon River | 6,335 | 5,845 | 1,345 | 13,880 | | 13,988 | 23,790 | 1,181 ^b | ^b | 4,989 |
| Tutuksuk River | 2,275 | 744 | 1,162 | 1,196 | | 3,901 | 21,805 | 163 ^b | ^b | 2,906 |
| Kobuk River System Total | 29,465 | 35,720 | 17,075 | 31,697 | | 64,219 | 131,105 | 14,636 | ^b | 48,748 |

-continued-

Appendix C8.–Page 2 of 2.

| Stream ^a | 2001 | 2002 | 2003 | 2004 | 2006 | 2008 | 2009 | Goals ^e |
|-------------------------------------|--------|-------|--------------|--------|---------------------|---------|--------|--------------------|
| Noatak Drainage | | | | | | | | |
| Noatak River below Kelly River | | 700 | 34,575 | 49,541 | 36,125 ^b | 257,695 | 67,265 | |
| Eli River | | | | 2,917 | 1,285 ^b | 13,052 | 2,607 | |
| Kelly River and Lake | | 1,116 | 1,566 | 2,987 | 2,375 ^b | 1,865 | 3,986 | |
| Noatak River System Total | | | 36,141 | 55,445 | 39,785 ^b | 272,612 | 73,858 | 42,000–91,000 |
| Kobuk Drainage | | | | | | | | |
| Kobuk to Pah River | 2,790 | | 5,501 | 7,493 | 8,525 ^b | 19,421 | 7,468 | |
| Pah River to just below Selby River | 1,380 | 857 | 828 | 1,885 | | 5,795 | 10,852 | |
| Selby River mouth & slough | 1,780 | 2,100 | 1,110 | 3,846 | | | | |
| Selby River | | | 427 | 3,760 | 500 ^b | 1,750 | 208 | |
| Selby River mouth to Beaver Creek | 7,470 | | 1,274 | 6,215 | | 13,201 | 26,627 | |
| Beaver Creek mouth | | | | | | | | |
| Above Beaver Creek | | 490 | 2,462 | | | 3,180 | | |
| Upper Kobuk River Total | 13,420 | 3,447 | 11,602 | 23,199 | 48,750 ^b | 43,347 | 45,155 | 9,700–21,000 |
| Squirrel River | | | ^b | | | | | 4,900–10,500 |
| Salmon River | | | ^b | | | | | 3,300–7,200 |
| Tutuksuk River | | | ^b | | | | | 1,400–3,000 |
| Kobuk River System Total | 13,420 | 3,447 | 11,602 | 23,199 | 48,750 ^b | 43,347 | 45,155 | 19,600–39,200 |

Note: No surveys were flown in 2000, 2005, 2007, or since 2009.

^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.

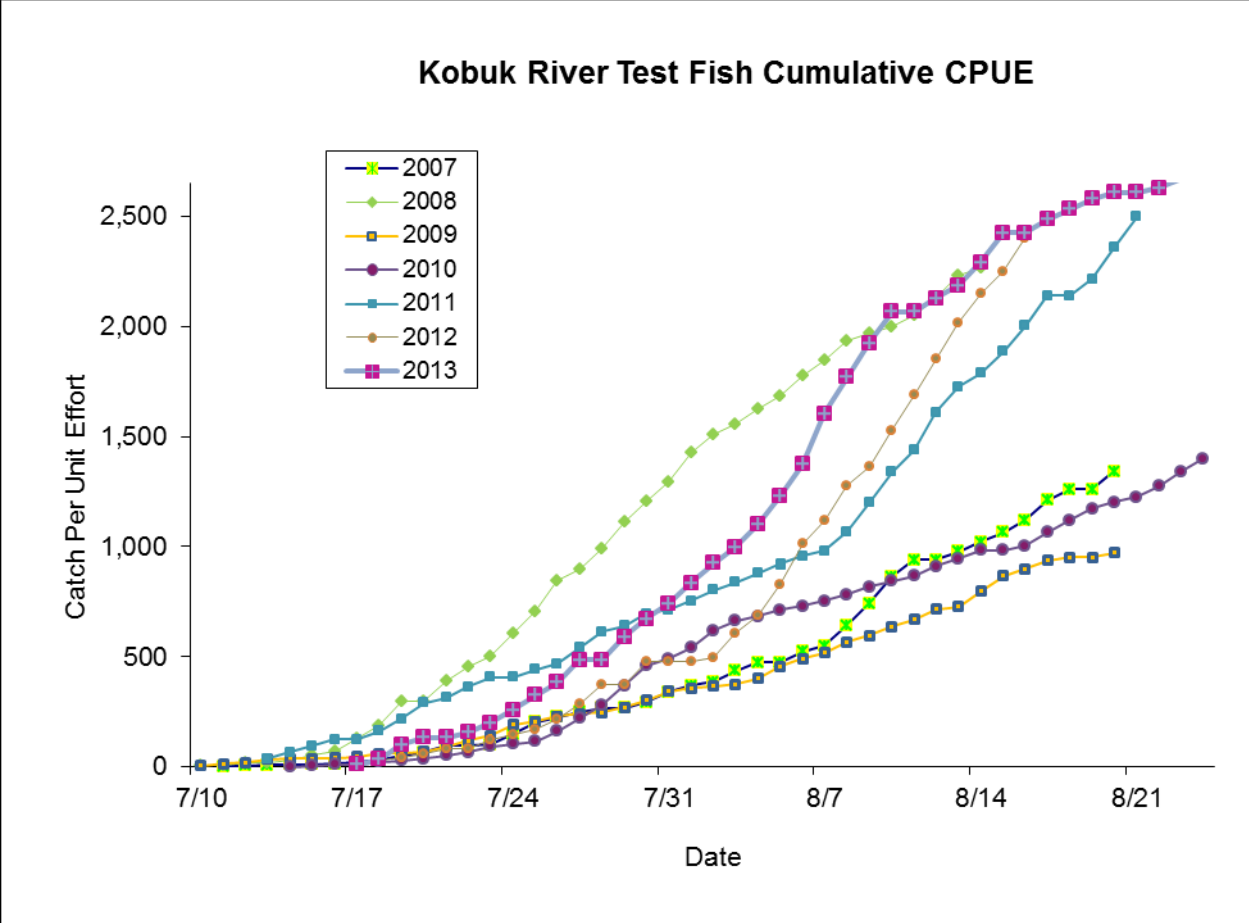
^b Poor survey conditions or incomplete, early, or late survey.

^c Unacceptable survey conditions.

^d Surveyed well before peak of migration.

^e Aerial survey goals were revised in 2007.

^f Unclear where these fish were observed.



Appendix C9.—Kobuk River chum salmon drift test fish cumulative catch per unit effort (CPUE), 2007–2013.

APPENDIX D: HERRING FISHERIES

Appendix D1.—Norton Sound herring and spawn-on-kelp harvests (in tons) by U.S. commercial fishermen, 1990–2013.

| Year ^a | Sac Roe Herring | Food or bait herring | Total herring | Spawn on kelp |
|-------------------|--------------------|----------------------|---------------|-------------------|
| 1990 | 5,253 | 1,026 | 6,279 | 0 |
| 1991 | 5,465 | 207 | 5,672 | 0 |
| 1992 ^b | 0 | 0 | 0 | 0 |
| 1993 | 4,713 | 321 | 5,034 | 0 |
| 1994 | 958 | 2 | 960 | 0 |
| 1995 | 6,647 | 116 | 6,763 | 0 |
| 1996 ^c | 6,061 | 109 | 6,220 | 0 |
| 1997 ^d | 3,709 | 262 | 3,976 | 0 |
| 1998 | 2,623 | 8 | 2,631 | 9.04 ^e |
| 1999 | 2,693 ^f | 53 | 2,751 | 3.74 |
| 2000 | 4,487 ^g | 0 | 4,487 | 2.25 |
| 2001 | 2,245 | 0 | 2,245 | 2.20 |
| 2002 | 1,059 | 64 | 1,123 | 0 |
| 2003 | 1,587 | 21 | 1,608 | 0.88 |
| 2004 ^b | 0 | 11 | 11 | 0 |
| 2005 | 1,951 | 0 | 1,951 | 0 |
| 2006 | 646 | 25 | 671 | 0.57 |
| 2007 ^b | 0 | 33 | 33 | 0.14 |
| 2008 ^b | 0 | 91 | 91 | 0.18 |
| 2009 ^b | 0 | 28 | 28 | 0 |
| 2010 | 623 | 65 | 688 | 0 |
| 2011 | 739 | 67 | 806 | 0 |
| 2012 ^b | 0 | 7 | 7 | 0 |
| 2013 | 490 | 2 | 492 | 0 |

^a From 1990 to present, the fishery has occurred in southeastern Norton Sound.

^b No commercial fishery took place in 1992, and no sac roe fishery took place in 2004, 2007–2009, and 2012.

^c Total includes an estimated 50 short tons (st) of wastage.

^d Total includes an estimated 5 st of wastage and approximately 1,000 lb taken as bait.

^e Includes 2,100 lb of wild kelp and 16,083 lb of *Macrocystis* kelp.

^f Includes an estimated 5 st of wastage.

^g Includes an estimated 15 st of wastage.

Appendix D2.–Commercial herring fishery summary information, Norton Sound District, 1990–2013.

| Year | Estimated biomass (tons) | Catch gillnet (tons) | Beach seine (tons) | Wild kelp (tons) | <i>Macrocystis</i> kelp (lbs.) | Number of fishermen | Dollar value (millions) | Number of buyers | Average roe % | Peak catch day | Fishery duration |
|-------------------|--------------------------|----------------------|--------------------|------------------|--------------------------------|---------------------|-------------------------|------------------|---------------|-------------------|------------------|
| 1990 | 39,384 | 6,032 | 347 | | | 365 | 3.60 | 8 | 8.8 | 5/29 | 5/28–05/30 |
| 1991 | 42,854 | 5,150 | 522 | | | 279 | 2.40 | 8 | 9.3 | 5/25 | 5/23–05/25 |
| 1992 | 57,974 | 0 ^a | 0 ^a | | | ^a | 0.00 | ^a | ^a | 6/20 ^b | ^a |
| 1993 | 46,549 | 4,291 | 742 | | | 264 | 1.50 | 5 | 9.9 | 5/25 | 5/24–06/05 |
| 1994 | 31,088 | 921 | 40 | | | 215 | 0.30 | 6 | 10.3 | 6/8 | 6/05–06/09 |
| 1995 | 37,779 | 6,033 | 614 | | | 215 | 4.20 | 6 | 10.4 | 5/24 | 5/23–05/30 |
| 1996 | 26,596 | 5,581 | 589 | | | 287 | 4.50 | 10 | 10.6 | 5/25 | 5/24–05/25 |
| 1997 | 47,748 | 3,459 | 513 | | | 220 | 0.61 | 9 | 9.9 | 5/22 | 5/20–05/24 |
| 1998 | 52,033 | 2,632 | 0 | 1.00 | 16,083 | 47 | 0.20 | 2 | 9.2 | 5/25 | 5/22–06/09 |
| 1999 | 34,314 | 2,755 | 0 | | 7,482 | 122 | 0.61 | 4 | 10.5 | 6/17 | 6/13–06/22 |
| 2000 | 32,680 | 4,390 | 81 | | 4,500 | 97 | 0.89 | 4 | 9.5 | 6/11 | 6/07–06/15 |
| 2001 | 26,305 | 2,245 | 0 | | 4,400 | 76 | 0.35 | 3 | 12.3 | 6/12 | 6/12–06/16 |
| 2002 | 27,068 | 1,123 | 0 | | 0 | 46 | 0.16 | 2 | 10.6 | 5/24 | 5/22–06/03 |
| 2003 | 32,918 | 1,608 | 0 | | 1,750 | 32 | 0.22 | 2 | 10.5 | 5/18 | 5/16–05/25 |
| 2004 ^a | 34,180 | 11 ^c | 0 | | 0 | 4 | 0.00 | 0 | ^a | 5/24 ^b | ^c |
| 2005 | 43,013 | 1,951 | 0 | | 0 | 56 | 0.32 | 1 | 11.4 | 6/04 | 6/03–06/10 |
| 2006 | 38,833 ^d | 671 ^e | 0 | 0.57 | 0 | 41 | 0.14 | 1 | 10.2 | 6/09 | 6/08–06/11 |
| 2007 ^a | 38,415 ^d | 33 | 0 | 0.14 | 0 | 7 | 0.02 | 1 | ^a | 6/09 | 6/09–06/15 |
| 2008 ^a | 37,401 ^d | 91 | 0 | | 0 | 14 | 0.18 | 1 | ^a | 6/11 | 6/10–06/24 |
| 2009 ^a | 36,917 ^d | 28 | 0 | | 0 | 6 | 0.02 | 1 | ^a | 6/12 | 6/12–06/15 |
| 2010 | 42,889 ^d | 688 | 0 | | 0 | 30 | 0.19 | 1 | 13.5 | 6/17 | 6/11–06/19 |
| 2011 | 53,786 | 807 | 0 | | 0 | 35 | 0.27 | 1 | 14.8 | 6/04 | 6/01–06/10 |
| 2012 ^a | 52,949 ^d | 7 | 0 | | 0 | 8 | 0.01 | 1 | ^a | 6/25 | 6/16–06/25 |
| 2013 | 58,594 ^d | 492 | 0 | | 0 | 40 | 0.15 | 1 | 13.2 | 6/15 | 6/14–06/20 |

^a No fishery in 1992 and very limited fishery in 2012 due to late sea ice breakup, and no sac roe fishery in 2004 and 2007–2009 due to lack of a buyer.

^b Date of peak aerial survey biomass estimate, typically 1 or 2 days prior to peak catch. The 2004 catch was by king crab permit holders for bait.

^c All fish caught were kept as bait; none were sold.

^d Conditions did not allow for a peak survey; therefore, biomass was estimated by extrapolation.

^e Twenty-five tons out of total sac roe herring catch was sold off as bait to NSEDC.

Appendix D3.—Norton Sound commercial herring harvest (tons) by subdistrict, by year, 1990–2013.

| Year ^a | Subdistricts | | | | | | | Totals |
|-------------------|--------------|-----|-------|---|-------|-----|----------------|--------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 1990 | 4,498 | 950 | 931 | 0 | 0 | 0 | 0 | 6,379 ^b |
| 1991 | 0 | 880 | 4,792 | 0 | 0 | 0 | 0 | 5,672 ^c |
| 1992 ^d | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 2,288 | 587 | 1,881 | 0 | 278 | 0 | 0 | 5,034 ^e |
| 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 ^f |
| 1997 | 2,046 | 62 | 1,864 | 0 | 0 | 0 | 1 ^g | 3,976 ^h |
| 1998 | 1,543 | 0 | 1,081 | 0 | 0 | 0 | 0 | 2,624 |
| 1999 | 285 | 323 | 2,050 | 0 | 0 | 0 | 8 | 2,746 ⁱ |
| 2000 ^j | 2,623 | 81 | 1,767 | 0 | 0 | 0 | 0 | 4,471 |
| 2001 ^j | 898 | 0 | 1,347 | 0 | 0 | 0 | 0 | 2,245 |
| 2002 ^j | 373 | 0 | 750 | 0 | 0 | 0 | 0 | 1,123 |
| 2003 ^j | 283 | 0 | 1,325 | 0 | 0 | 0 | 0 | 1,608 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| 2005 ^j | 783 | 9 | 1,149 | 0 | 10 | 0 | 0 | 1,951 |
| 2006 | 191 | 0 | 480 | 0 | 0 | 0 | 0 | 671 |
| 2007 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 33 |
| 2008 | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 91 |
| 2009 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 28 |
| 2010 | 314 | 300 | 74 | 0 | 0 | 0 | 0 | 688 |
| 2011 | 600 | 84 | 123 | 0 | 0 | 0 | 0 | 807 |
| 2012 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 7 |
| 2013 | 107 | 84 | 302 | 0 | 0 | 0 | 0 | 492 |

^a Includes herring taken for sac roe and bait.

^b Does not include an estimated wastage of 60 short tons (st) in abandoned gillnets.

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

^d No commercial fishery in 1992.

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

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

^g Approximately 1,000 lb of herring bait was taken under 5 AAC 27.971 in June (not during sac roe fishery).

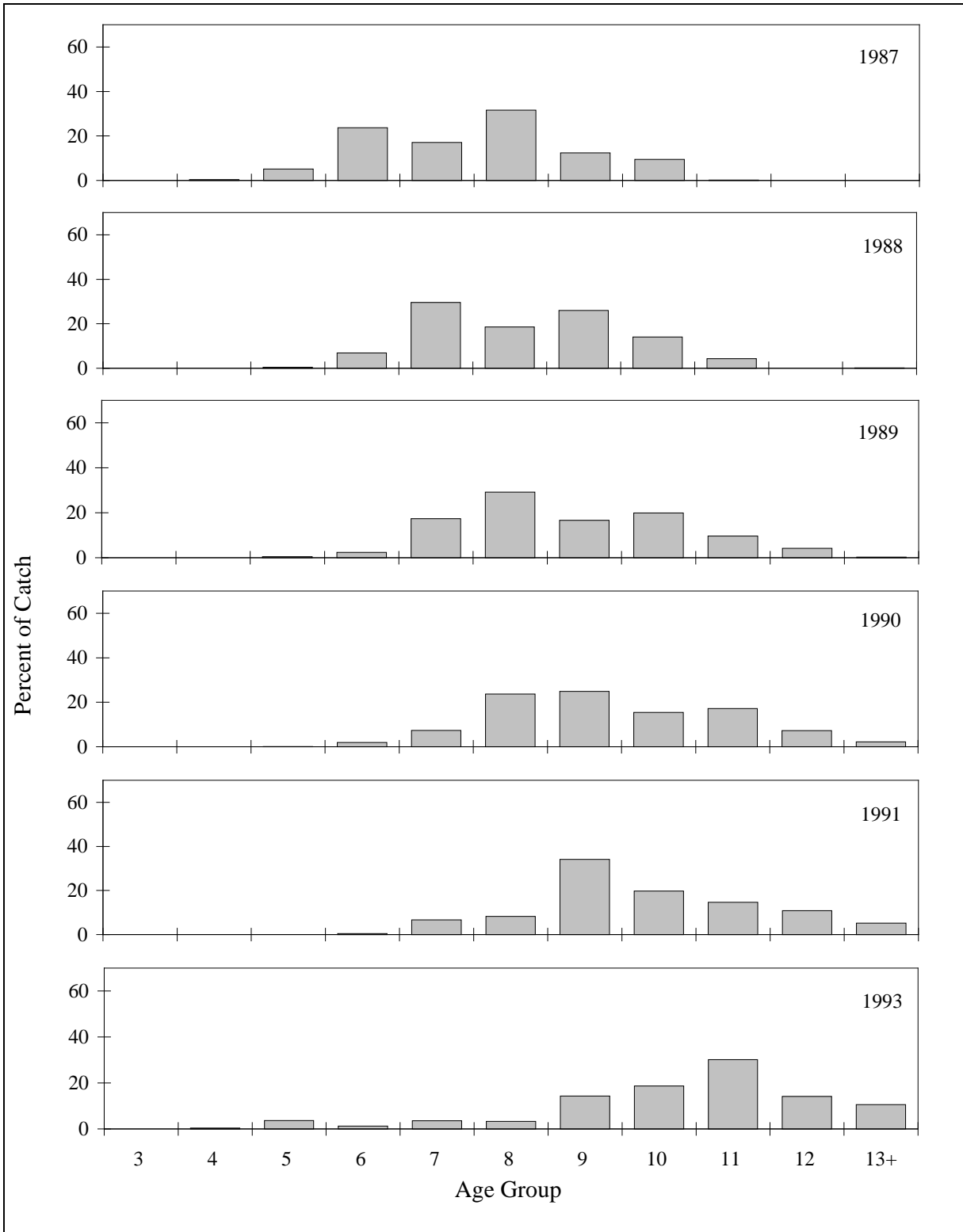
^h Does not include an estimated 5 st of wastage.

ⁱ There were 75.8 tons added to the sac roe total due to dewatering by buyers. Three tons were added to the bait total due to dewatering by the buyer. Does not include an estimated 5 st of wastage.

^j There was 10% added to sac roe total due to dewatering by buyers.

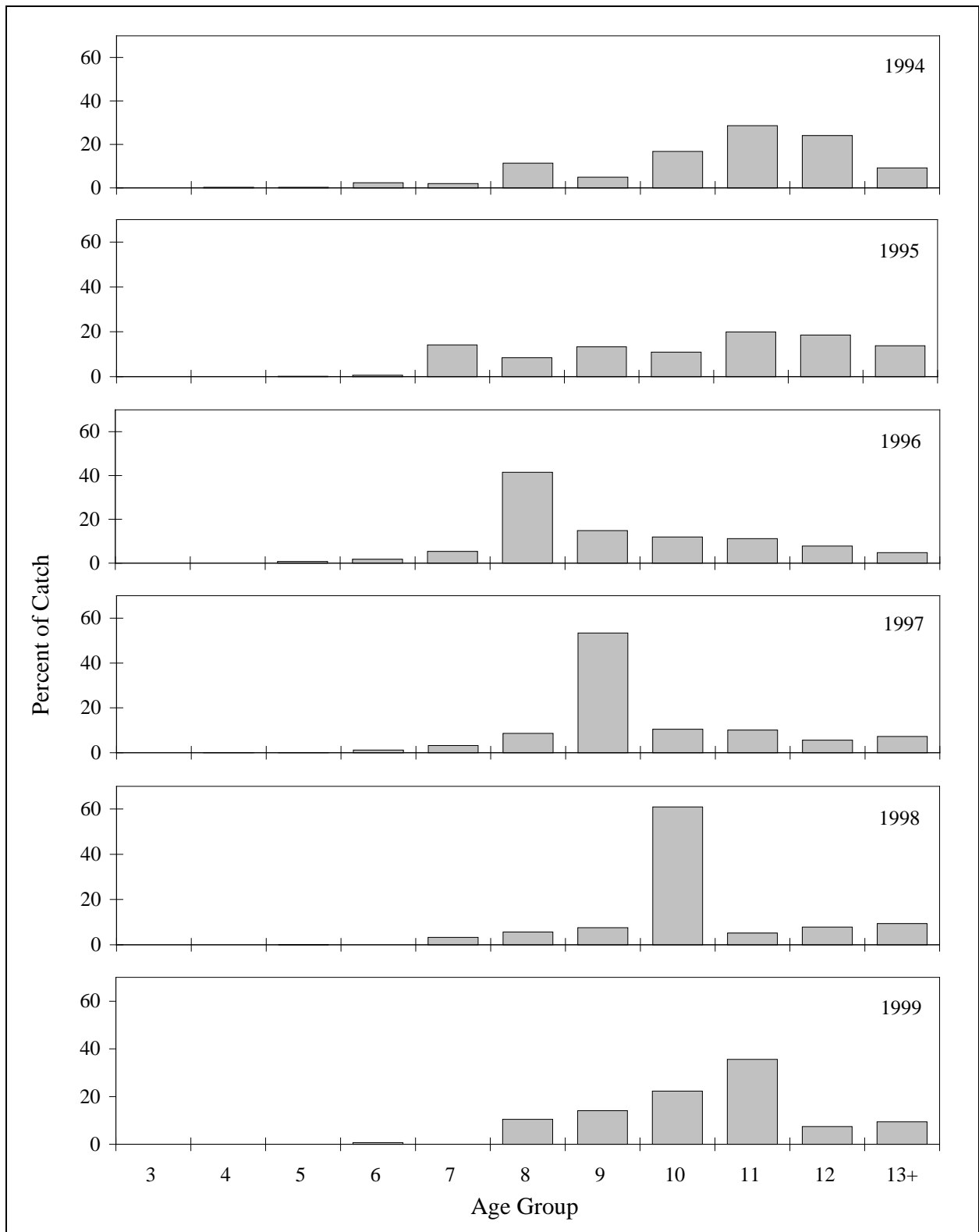
Appendix D4.–Port Clarence District commercial herring fishery, 1986–1996.

| Year | Fishery | Gillnet Permits | Purse Seine Permits | Harvest (pounds) |
|------|-------------|-----------------|---------------------|------------------|
| 1986 | Fall Bait | 1 | | 130 |
| 1987 | Sac Roe | 3 | 3 | 291,000 |
| 1987 | Fall Bait | Unknown | | 1,100 |
| 1988 | Sac Roe | 3 | 3 | 160,000 |
| 1994 | Fall Bait | 4 | | 8,706 |
| 1995 | Spring Bait | 8 | | 19,193 |
| 1995 | Fall Bait | 2 | | 9,119 |
| 1996 | Spring Bait | 4 | | 5,546 |



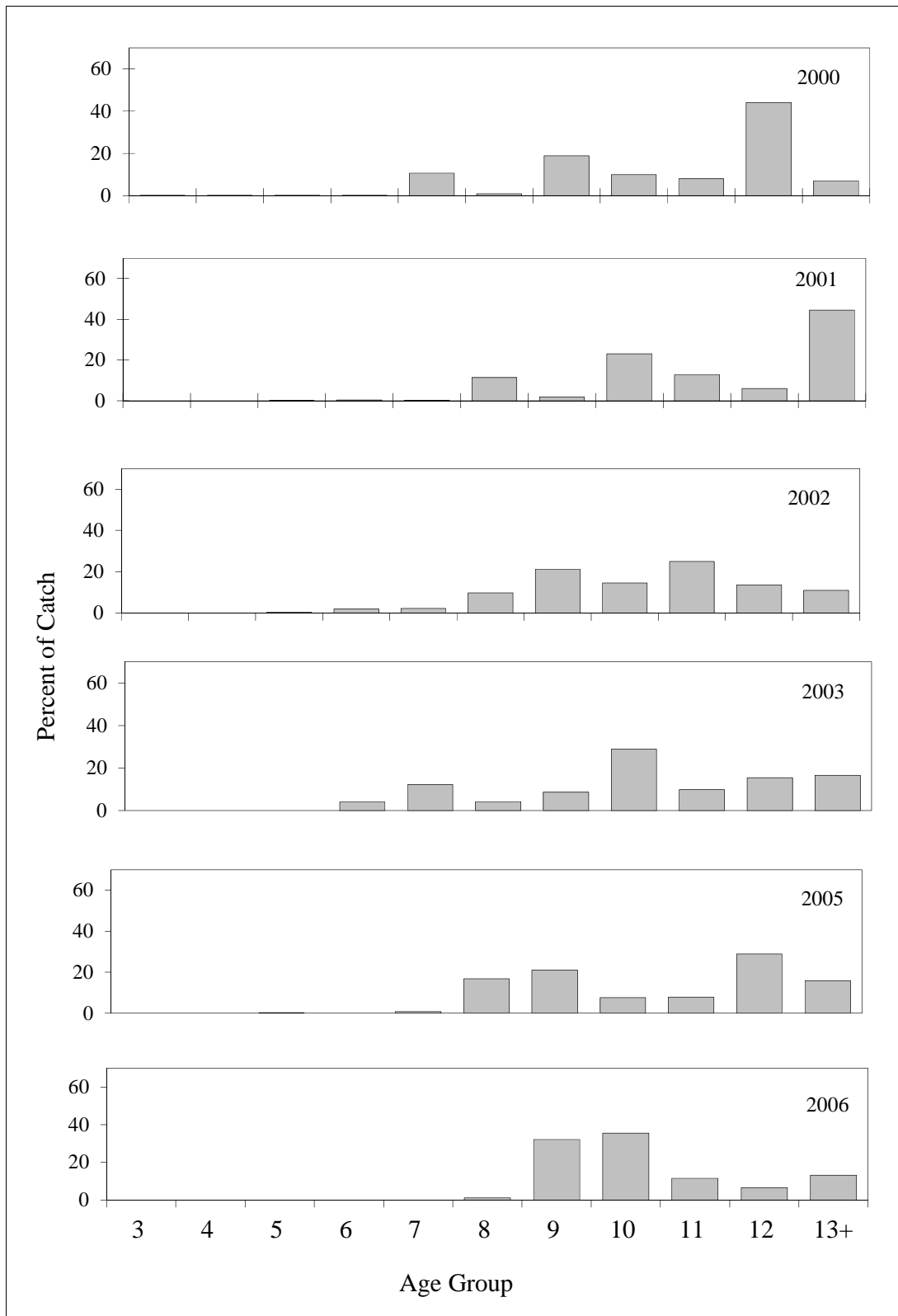
Appendix D5.—Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1987–1993.

Note: No commercial fishing occurred in 1992.



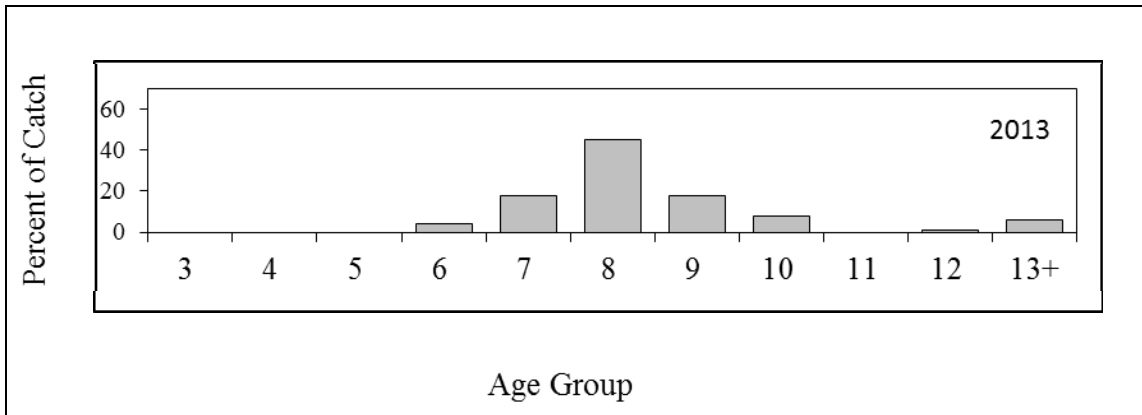
Appendix D6.—Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1994–1999.

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



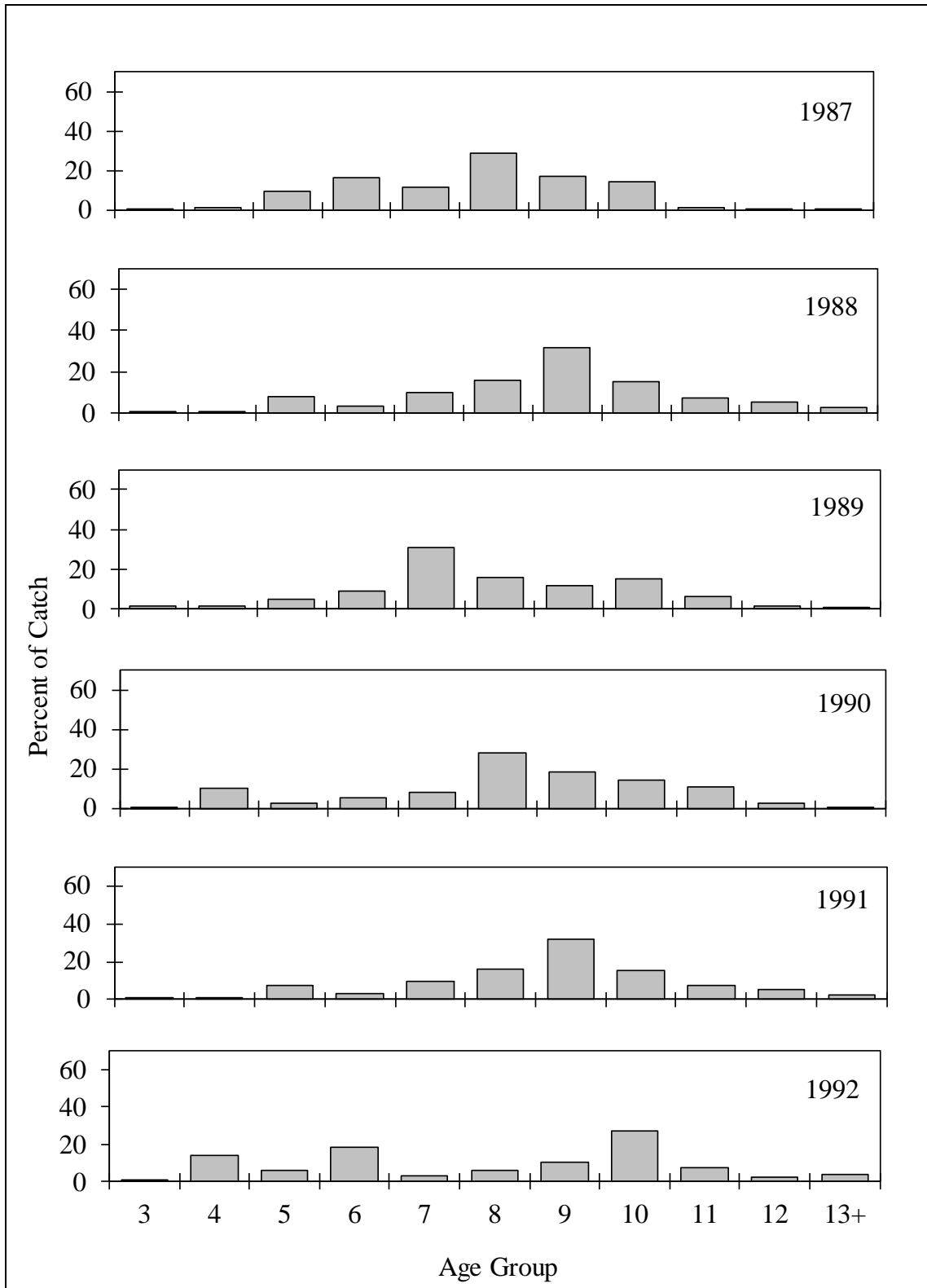
Appendix D7.—Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 2000–2006.

Note: No commercial catch from beach seine gear after 2000. No fishery in 2004.

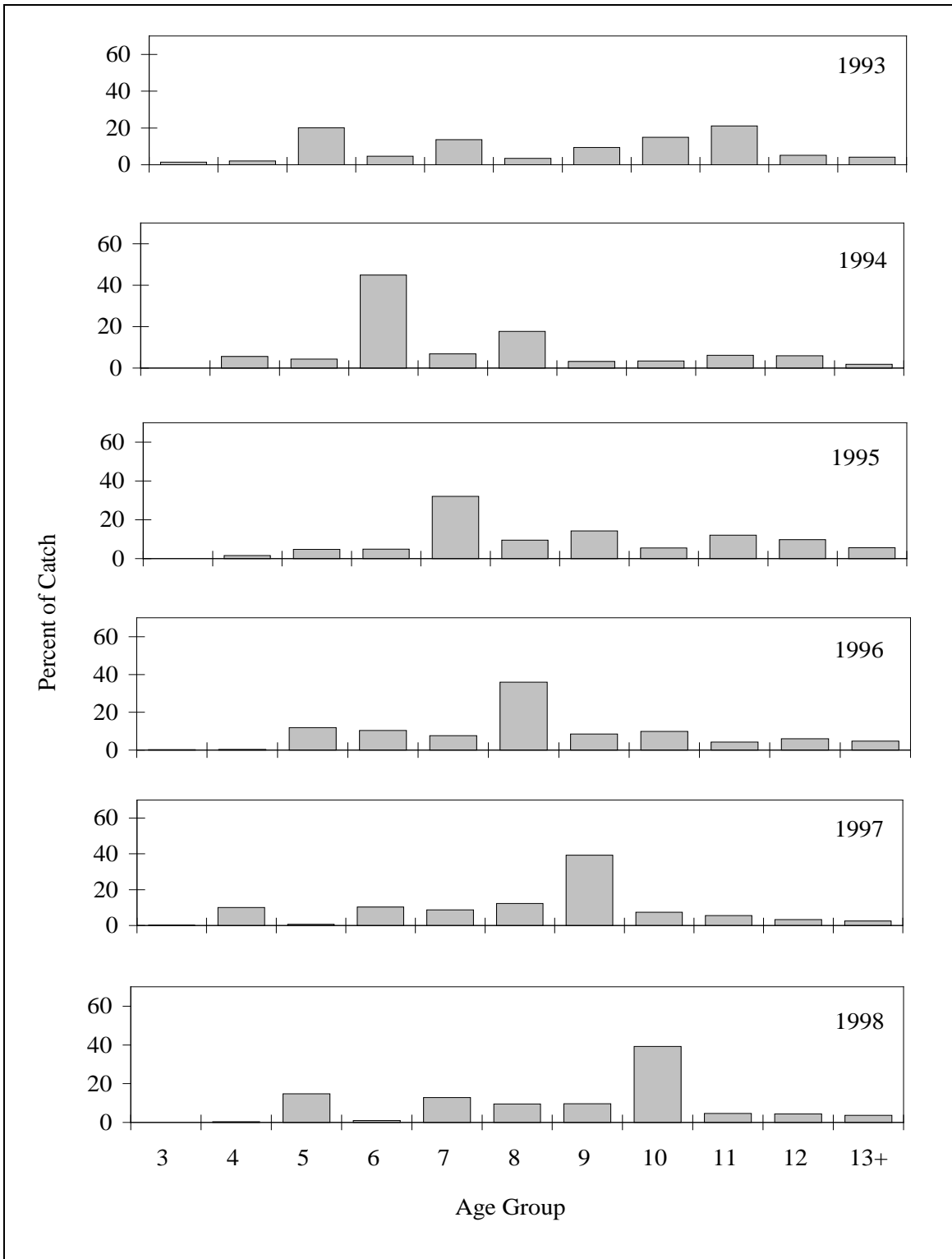


Appendix D8.—Norton Sound herring age class composition by percentage of commercial catch, commercial gear (gillnet only), 2013.

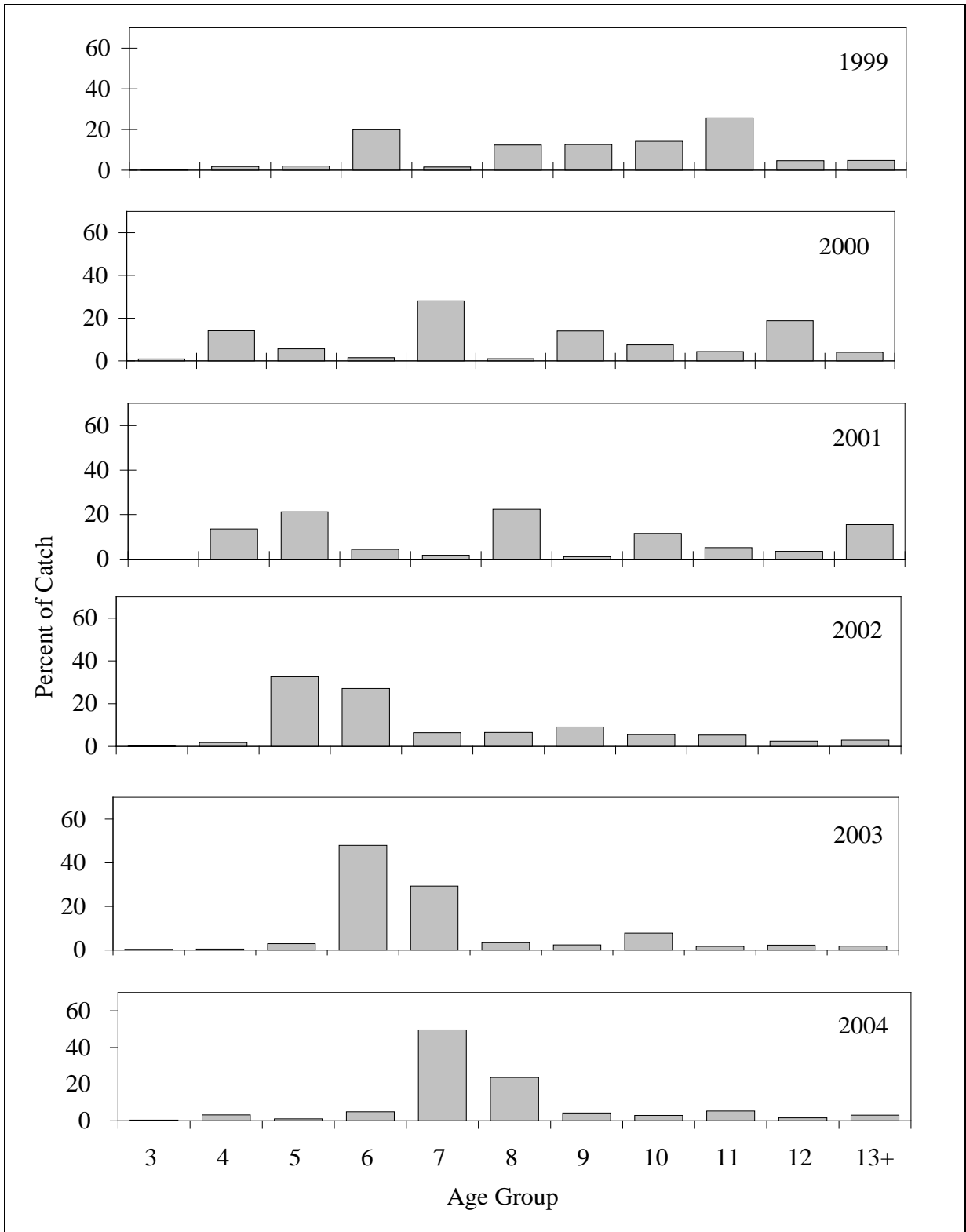
Note: No commercial samples were available 2007–2012.



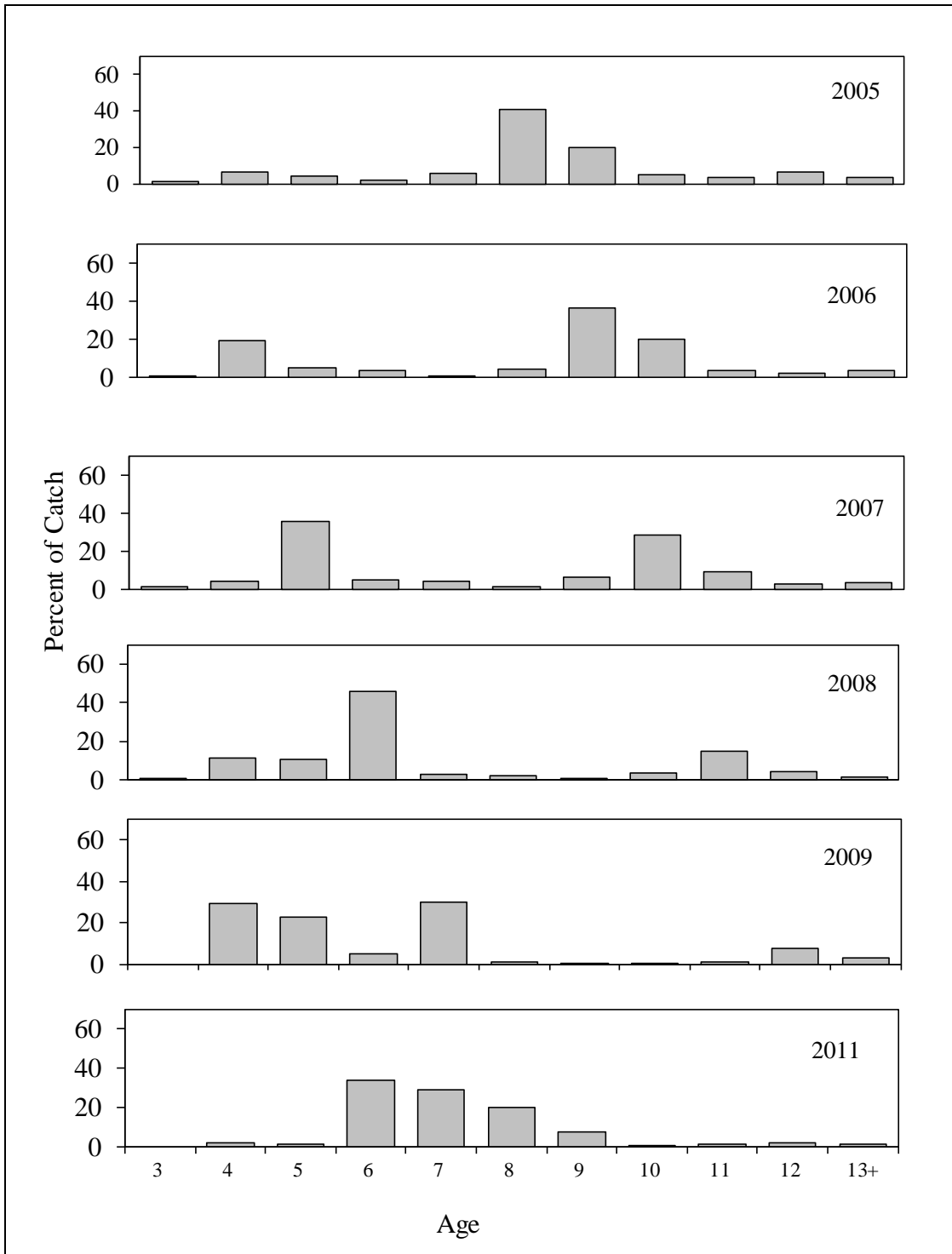
Appendix D9.—Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1987–1992.



Appendix D10.—Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1993–1998.

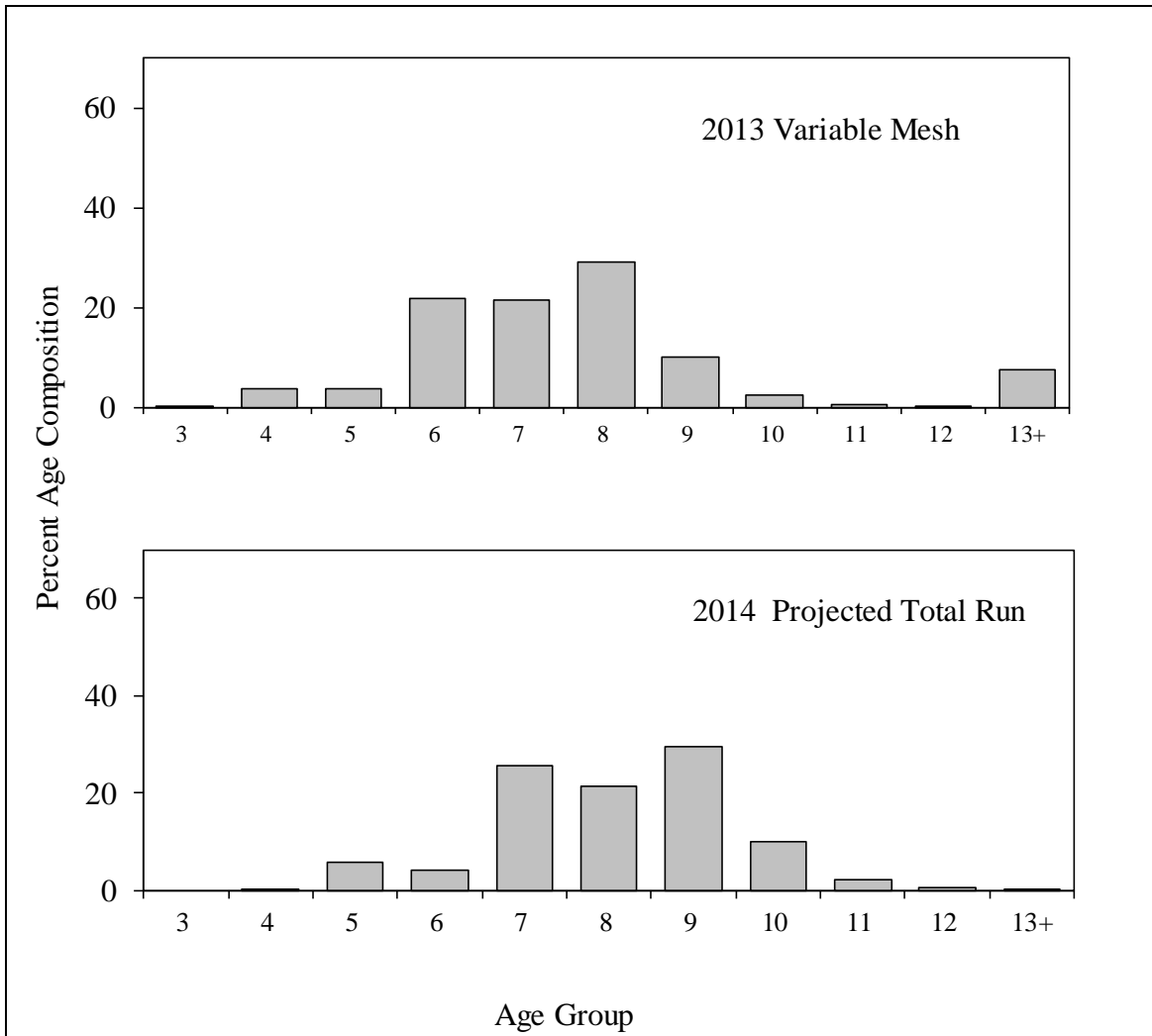


Appendix D11.—Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1999–2004.



Appendix D12.—Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 2005–2012.

Note: Herring age class composition by percentage of total catch for 2010 and 2012 was not available.



Appendix D13.—Norton Sound Pacific herring age composition comparison of the 2013 variable-mesh gear and the projected age composition of the 2014 return.

APPENDIX E: KING CRAB FISHERIES

Appendix E1.—Historical commercial summer harvest of red king crab from Norton Sound Section, Eastern Bering Sea, by statistical areas, 1990–2013 (catch in pounds).

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| Statistical Area | 1990 | 1992 | 1993 | 1994 | 1995 | 1996 ^a | 1997 | 1998 | 1999 |
|------------------|---------|--------|---------|---------|---------|-------------------|--------|--------|--------|
| 616331 | | | | 48 | | | | | 633 |
| 616401 | | | | | 35 | | | | |
| 626331 | | | | | | 61 | | | |
| 626401 | | | | | 18,971 | 45,045 | 18,066 | 8,065 | 508 |
| 626402 | | | | | | | | | |
| 636330 | | | | | | 4,560 | 3,838 | 2,449 | |
| 636401 | | 1,159 | 1,373 | 3,340 | 24,329 | 70,677 | 59,206 | 10,771 | 14,201 |
| 636402 | | | | 1,754 | 3,466 | | | | |
| 646301 | | | | | 4,628 | 13,888 | | | |
| 646330 | | | | | 1,493 | 2,894 | 314 | | 3,021 |
| 646401 | | | 1,963 | 37,510 | 105,045 | 22,834 | 1,052 | 3,194 | 221 |
| 646402 | | | 730 | 139,661 | 66,821 | | | | |
| 656300 | | | | | | | | | |
| 656330 | | 4,814 | 265 | | 19,745 | 15,446 | 4,661 | 4,078 | 1,300 |
| 656401 | 171 | 53,119 | 105,341 | 34,686 | 32,289 | 9,985 | 4,035 | 1,127 | 2,739 |
| 656402 | | | 193,079 | 110,289 | 44,000 | | | | |
| 666230 | | | | | | | | | |
| 666300 | | | | | | 25,519 | | | |
| 666330 | 27,185 | 4,305 | 31,758 | | 730 | | | | |
| 666401 | 162,263 | 10,632 | 746 | 396 | | 3,001 | 1,816 | | 930 |
| 666402 | | | 535 | 1,221 | | | | | |
| 666431 | | | | | 1,124 | | | | |
| 676300 | | | | | | 546 | | | |
| 676330 | | | | | | | | | |
| 676400 | 3,212 | | | | | 9,775 | | | |
| 676430 | | | | | | | | | |
| 676501 | | | | | | | | | |
| 686330 | | | | | | | | | |
| 686431 | | | | | | | | | |
| Total (tons) | 96 | 37 | 168 | 164 | 161 | 112 | 46 | 15 | 12 |

-continued-

Appendix E1.--Page 2 of 3.

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| Statistical Area | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|------------------|---------|--------|--------|--------|---------|---------|--------|---------|---------|---------|
| 616331 | 4,557 | | 3,506 | 646 | | | 2357 | | 5,658 | 888 |
| 616401 | | | | | | | | 231 | 416 | 6,170 |
| 626331 | | | 2,455 | | | | 1415 | 27,018 | 3,235 | 3,047 |
| 626401 | 4,689 | 61,620 | 53,722 | 15,899 | 23,113 | 94,130 | 118202 | 61,704 | 96,327 | 103,043 |
| 626402 | | | | 1,352 | | | | | | |
| 636330 | | 2,253 | | | | 126 | 26680 | 10,253 | 2,350 | 5,026 |
| 636401 | 130,463 | 91,343 | 50,906 | 83,949 | 166,489 | 227,204 | 224531 | 123,092 | 197,948 | 96,279 |
| 636402 | | | | | | | | | | |
| 646301 | | | | | | | | | | |
| 646330 | | 1,868 | 1,955 | | 2,226 | 4,097 | 2629 | 5,290 | 1,505 | 933 |
| 646401 | | 4,287 | | 3,952 | 1,964 | 149 | 1660 | | 18,728 | 46,264 |
| 646402 | | | | | | | | | | |
| 656300 | | | | 14 | 932 | | 284 | 1,909 | | |
| 656330 | 1,990 | 20,869 | 12,374 | 21,176 | 46,288 | 47,411 | 17752 | 4,911 | | 10,617 |
| 656401 | 95,979 | 55,158 | 63,038 | 40,566 | 21,579 | 9,405 | 28434 | 70,065 | 68,968 | 107,557 |
| 656402 | | | | 1,441 | | 380 | 807 | 2,254 | | |
| 666230 | | | | | | | 1721 | | | |
| 666300 | | | | | | | 18245 | | | |
| 666330 | 5,839 | 7,030 | 1,332 | 1,296 | 12,359 | 142 | 5041 | 511 | | 1,514 |
| 666401 | 69,007 | 43,771 | 35,970 | 83,998 | 42,452 | 727 | 600 | 2,498 | | 10,021 |
| 666402 | | | 30,070 | 12,873 | 23,344 | 16,025 | 1050 | 2,959 | | 6,228 |
| 666431 | | | 4,274 | 45 | | | | | | |
| 676300 | | | | | | | | | | |
| 676330 | | | | | | | | | | |
| 676400 | | | | | | | | 180 | | |
| 676430 | | | | | | | | | | |
| 676501 | | | | | | 1,008 | | | | |
| 686330 | | | | | | | | | | |
| 686431 | | | | | | | 340 | | | |
| Total (tons) | 156 | 144 | 130 | 134 | 170 | 200 | 226 | 156 | 198 | 199 |

-continued-

Appendix E1.—Page 3 of 3.

| Statistical Area | 2010 | 2011 | 2012 | 2013 | Total |
|------------------|---------|---------|---------|---------|-----------|
| 616331 | | | | | 18,293 |
| 616401 | | | | 7,729 | 14,581 |
| 626331 | | 2,489 | | 686 | 40,406 |
| 626401 | 52,054 | 85,271 | 115,524 | 36,802 | 1,012,755 |
| 626402 | | | | | 1,352 |
| 636330 | 2,584 | | 1,454 | 12,035 | 73,608 |
| 636401 | 182,040 | 146,973 | 148,183 | 34,027 | 2,088,482 |
| 636402 | | | | | 5,220 |
| 646301 | | | | | 18,516 |
| 646330 | 1,205 | | 1,204 | 4,195 | 34,829 |
| 646401 | 77,437 | 83,099 | 98,811 | 59,737 | 567,907 |
| 646402 | | | | 5,271 | 212,483 |
| 656300 | | | | | 3,139 |
| 656330 | 17,660 | 1,546 | 8,168 | 8,515 | 269,586 |
| 656401 | 82,747 | 77,149 | 85,920 | 147,569 | 1,197,625 |
| 656402 | | | | 37,743 | 389,993 |
| 666230 | | | | | 1,721 |
| 666300 | | | | | 43,764 |
| 666330 | | 2,042 | 1,000 | | 102,084 |
| 666401 | | | 15,726 | 33,469 | 518,023 |
| 666402 | 1,577 | 2,271 | | 1,419 | 99,572 |
| 666431 | | | | 2,669 | 8,112 |
| 676300 | | | | | 546 |
| 676330 | | | | | 0 |
| 676400 | | | | | 13,167 |
| 676430 | | | | | 0 |
| 676501 | | | | | 1,008 |
| 686330 | | | | | 0 |
| 686431 | | | | | 340 |
| Total | | | | | 6,737,111 |
| (tons) | 209 | 200 | 238 | 196 | 3,369 |

Note: Not all statistical areas had recorded harvest. No commercial fishery occurred in 1991.

^a Does not include approximately 2,490 lb not reported on fish tickets.

Appendix 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 Estimates | | | Legal Male Biomass (millions of pounds) |
|-------------------|------------|-----------------|-------|--------------------------------|--------------------------|--------------------------|--|
| | | | | Number of crab ^a | | | |
| | | | | Pre-2 males ^b | Pre-1 Males ^b | Legal Males ^c | |
| 1976 | 9/02–09/05 | NMFS | Trawl | 331,555 | 808,091 | 1,742,755 | 5,228,265 |
| | 9/16–10/07 | | | | | | |
| 1979 ^d | 7/26–08/05 | NMFS | Trawl | | | 809,799 | 2,429,397 |
| 1980 ^e | 7/04–07/14 | ADF&G | Pots | | | 1,900,000 | 5,700,000 |
| 1981 | 6/28–07/14 | ADF&G | Pots | | | 1,285,195 | 3,855,585 |
| 1982 | 7/06–07/20 | ADF&G | Pots | | | 353,273 | 1,059,819 |
| 1982 | 9/05–09/11 | NMFS | Trawl | 356,724 | 832,581 | 877,722 | 2,633,166 |
| 1985 | 7/01–07/14 | ADF&G | Pots | | | 907,579 | 2,722,737 |
| 1985 | 9/16–10/01 | NMFS | Trawl | 466,858 | 707,140 | 1,051,857 | 3,155,571 |
| 1988 | 8/16–08/30 | NMFS | Trawl | 565,255 | 493,030 | 978,748 | 2,936,244 |
| 1991 | 8/22–08/30 | NMFS | Trawl | 294,801 | 303,682 | 1,287,486 | 3,862,458 |
| 1996 | 9/07–09/18 | ADF&G | Trawl | 452,580 | 325,699 | 536,235 | 1,608,705 |
| 1999 | 7/28–08/07 | ADF&G | Trawl | 103,832 | 940,198 | 1,594,341 | 4,783,023 |
| 2002 | 7/27–08/06 | ADF&G | Trawl | 427,703 | 518,638 | 771,569 | 2,314,707 |
| 2006 | 7/25–08/08 | ADF&G | Trawl | 775,076 | 569,833 | 726,251 | 2,178,753 |
| 2008 | 7/24–08/11 | ADF&G | Trawl | 795,777 | 697,442 | 811,727 | 2,435,182 |
| 2011 | 7/18–08/15 | ADF&G | Trawl | 431,153 | 311,550 | 1,310,634 | 3,931,902 |

Note: Data not available for all years.

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

^b Pre-2 male crab were defined as 76–89 mm in carapace length (CL), and pre-1 male crab were defined as 90–104 mm in CL.

^c Legal male red king crab were defined as ≥ 121 mm (4.75 in) in carapace width for the pot surveys and all ADF&G trawl surveys (except for 1996, when legal male crab were defined as at least 105 mm CL), and ≥ 104 mm CL for all of the NMFS trawl surveys (except the 1979 survey, which defined legal male crab as at least 100 mm CL).

^d Pre-2 male and pre-1 male crab data are 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 under-reporting of recovered tagged crab.

Appendix E3.—Historical summer commercial red king crab fishery economic performance, Norton Sound Section, Eastern Bering Sea, 1990–2013.

| Year | Guideline | Legal male | | Commercial | | | | | Total exvessel price/lb | Total fishery value (millions \$) | Season length | | | |
|------|--|------------------------|------------------|------------------------------|------|-------------------|---------|--------------|-------------------------------|---|----------------------|--------------|-------|------------------------|
| | harvest level (lbs) ^b | population est. | | harvest (lbs) ^{a,b} | | Total number of | | | | | Total number of pots | Days | Dates | |
| | | No. crab (millions) | lbs ^b | Open access | CDQ | Vessels | Permits | Landings | Registered | Pulls | | | | |
| 1990 | 0.20 | | | 0.19 | | 4 | 4 | ^c | 1,388 | 3,172 | ^c | ^c | 4 | 8/01–8/05 |
| 1991 | 0.34 | 1.3 | 3.9 | | | No Summer Fishery | | | | | | | | |
| 1992 | 0.34 | | | 0.07 | | 27 | 27 | ^c | 2,635 | 5,746 | 1.75 | 0.130 | 2 | 8/01–8/03 |
| 1993 | 0.34 | | | 0.33 | | 14 | 20 | 208 | 560 | 7,063 | 1.28 | 0.430 | 52 | 7/01–8/28 ^d |
| 1994 | 0.34 | | | 0.32 | | 34 | 52 | 407 | 1,360 | 11,729 | 2.02 | 0.646 | 31 | 7/01–7/31 |
| 1995 | 0.34 | | | 0.32 | | 48 | 81 | 665 | 1,900 | 18,782 | 2.87 | 0.926 | 67 | 7/01–9/05 |
| 1996 | 0.34 | 0.5 | 1.5 | 0.22 | | 41 | 50 | 264 | 1,640 | 10,453 | 2.29 | 0.519 | 57 | 7/01–9/03 ^e |
| 1997 | 0.08 | | | 0.09 | | 13 | 15 | 100 | 520 | 2,982 | 1.98 | 0.184 | 44 | 7/01–8/13 ^f |
| 1998 | 0.08 | | | 0.03 | 0.00 | 8 | 11 | 50 | 360 | 1,639 | 1.47 | 0.041 | 65 | 7/01–9/03 ^g |
| 1999 | 0.08 | 1.6 | 4.8 | 0.02 | 0.00 | 10 | 9 | 53 | 360 | 1,630 | 3.08 | 0.073 | 66 | 7/01–9/04 ^h |
| 2000 | 0.33 | 1.4 | 4.2 | 0.29 | 0.01 | 15 | 22 | 201 | 560 | 6,345 | 2.32 | 0.715 | 91 | 7/01–9/29 ⁱ |
| 2001 | 0.30 | 1.3 | 3.8 | 0.28 | 0.00 | 30 | 37 | 319 | 1,200 | 11,918 | 2.34 | 0.674 | 97 | 7/01–9/09 ^j |
| 2002 | 0.24 | 1.0 | 3.1 | 0.24 | 0.01 | 32 | 49 | 201 | 1,120 | 6,491 | 2.81 | 0.729 | 77 | 6/15–9/03 ^k |
| 2003 | 0.25 | 1.0 | 3.1 | 0.25 | 0.01 | 25 | 43 | 236 | 960 | 8,494 | 3.09 | 0.823 | 68 | 6/15–8/24 ^l |
| 2004 | 0.35 | 1.6 | 4.4 | 0.31 | 0.03 | 26 | 39 | 227 | 1,120 | 8,066 | 3.12 | 1.063 | 51 | 6/15–8/08 ^m |
| 2005 | 0.37 | 1.7 | 4.8 | 0.37 | 0.03 | 31 | 42 | 255 | 1,320 | 8,867 | 3.14 | 1.264 | 73 | 6/15–8/27 ⁿ |
| 2006 | 0.45 | 1.6 | 4.5 | 0.42 | 0.03 | 28 | 40 | 249 | 1,120 | 8,867 | 2.26 | 1.021 | 68 | 6/15–8/22 ^m |
| 2007 | 0.32 | 1.1 | 3.1 | 0.29 | 0.02 | 38 | 30 | 251 | 1,200 | 9,118 | 2.49 | 0.750 | 52 | 6/15–8/17 ^m |
| 2008 | 0.41 | 1.5 | 4.1 | 0.36 | 0.03 | 23 | 30 | 248 | 920 | 8,721 | 3.20 | 1.231 | 73 | 6/23–9/03 ^o |
| 2009 | 0.38 | 1.3 | 3.8 | 0.37 | 0.03 | 22 | 27 | 359 | 920 | 11,934 | 3.17 | 1.225 | 98 | 6/15–9/20 ^p |
| 2010 | 0.40 | 1.7 | 4.5 | 0.39 | 0.03 | 23 | 32 | 286 | 1,040 | 9,698 | 3.73 | 1.528 | 58 | 6/28–8/24 ^q |

-continued-

Appendix E3.–Page 2 of 2.

| Year | Guideline | Legal Male | | Commercial | | Total | | | Total | | Season Length | | | |
|------|--------------------|-----------------|------------------|------------------------------|------|-----------------|---------|----------|----------------------|---------------|---------------|---------------|----|------------------------|
| | Harvest | Population Est. | | Harvest (lbs) ^{a,b} | | | | | Exvessel | Fishery Value | Days | Dates | | |
| | Level | No. crab | | Open | | Total Number of | | | Total Number of Pots | | Price/lb | (millions \$) | | |
| | (lbs) ^b | (millions) | lbs ^b | Access | CDQ | Vessels | Permits | Landings | Registered | Pulls | | | | |
| 2011 | 0.36 | 1.5 | 4.0 | 0.37 | 0.03 | 24 | 25 | 173 | 1,040 | 6,808 | 5.23 | 2.016 | 33 | 6/28–7/30 ^r |
| 2012 | 0.47 | 1.4 | 3.7 | 0.44 | 0.03 | 40 | 29 | 312 | 1,200 | 10,041 | 5.41 | 2.556 | 72 | 6/29–9/08 ^s |
| 2013 | 0.50 | 1.6 | 4.1 | 0.37 | 0.02 | 37 | 33 | 460 | 1,420 | 15,058 | 5.63 | 2.165 | 74 | 7/03–9/14 ^t |

^a Deadloss included in total. Data not available for all years.

^b Millions of pounds.

^c Information not available.

^d Fishing actually began 7/8.

^e Fishing began 7/9 due to fishermen strike.

^f First delivery was made 7/10.

^g First delivery was made 7/16.

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

ⁱ Open access fishery (OA) closed 8/29. CDQ fishery opened 9/1–9/29.

^j OA closed 9/1. CDQ fishery opened 9/1–9/9.

^k OA was 7/1–8/6. CDQ fishery opened 6/15–6/28 and 8/9–9/3.

^l OA was 7/1–8/13. CDQ fishery opened 6/15–6/28 and 8/15–8/24.

^m CDQ fishery opened 6/15–6/28. OA opened 7/1 to the end date.

^o OA opened 6/23–8/18. CDQ opened 8/17–9/3.

ⁿ OA was 7/1–8/15. CDQ fishery opened 6/15–6/28 and 8/17–8/27.

^p CDQ opened 6/15 – 7/28. OA opened 6/15 to the end date.

^q CDQ opened 6/28 – 7/16. OA opened 7/1 to the end date.

^r CDQ opened 6/28 – 7/8. OA opened 6/28 to the end date.

^s CDQ opened 6/29 to the end date. OA opened 6/29–8/11.

^t CDQ and OA opened and closed at the same time.

Appendix E4.—Average length and percentage of recruit and postrecruit male red king crab from summer commercial fishery catch samples in Norton Sound Section, Eastern Bering Sea, 1990–2013.

| Year | Average Length (mm) | Recruits ^a | Postrecruits ^b |
|-------------------|---------------------|-----------------------|---------------------------|
| 1990 | 121 | 21 | 79 |
| 1991 ^c | | | |
| 1992 | 120 | 28 | 72 |
| 1993 | 119 | 31 | 69 |
| 1994 | 119 | 20 | 80 |
| 1995 | 118 | 36 | 64 |
| 1996 | 117 | 30 | 70 |
| 1997 | 116 | 49 | 51 |
| 1998 | 117 | 32 | 68 |
| 1999 | 118 | 42 | 58 |
| 2000 | 116 | 41 | 60 |
| 2001 | 119 | 33 | 67 |
| 2002 | 120 | 33 | 67 |
| 2003 | 117 | 48 | 52 |
| 2004 | 117 | 49 | 51 |
| 2005 | 118 | 36 | 64 |
| 2006 | 119 | 25 | 75 |
| 2007 | 117 | 45 | 55 |
| 2008 | 115 | 45 | 55 |
| 2009 | 116 | 43 | 57 |
| 2010 | 115 | 49 | 51 |
| 2011 | 116 | 43 | 57 |
| 2012 | 118 | 33 | 67 |
| 2013 | 120 | 32 | 68 |

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

^b Postrecruits = all other male king crab of legal size.

^c No summer commercial fishery.

Appendix E5.—Winter commercial and subsistence red king crab harvests, Norton Sound, Eastern Bering Sea, 1990–2013.

| Year ^a | Commercial | | | Subsistence | | | | | | |
|-------------------|---------------------|--------------------------|--------------------------|----------------------|--------------------------|----------------------------|--------------------------|--------------------------------|-----------------------------------|------------------------------------|
| | Number of fishermen | Number of crab harvested | Pounds of crab harvested | Winter ^b | Number of permits issued | Number of permits returned | Number of permits fished | Total crab caught ^c | Total crab harvested ^d | Average number kept/permits fished |
| 1990 | 13 | 3,626 | 9,792 | 1989–90 | 136 | 118 | 107 | 16,635 | 12,152 | 114 |
| 1991 | 11 | 3,800 | 10,064 | 1990–91 | 119 | 104 | 79 | 9,295 | 7,366 | 93 |
| 1992 | 13 | 7,478 | 21,177 | 1991–92 | 158 | 105 | 105 | 15,051 | 11,736 | 112 |
| 1993 | 8 | 1,788 | 4,926 | 1992–93 | 88 | 79 | 37 | 1,193 | 1,097 | 30 |
| 1994 | 25 | 5,753 | 17,214 | 1993–94 | 118 | 95 | 71 | 4,894 | 4,113 | 58 |
| 1995 | 42 | 7,538 | 18,845 | 1994–95 | 166 | 131 | 97 | 7,777 | 5,426 | 56 |
| 1996 | 9 | 1,999 | 5,064 | 1995–96 | 84 | 44 | 35 | 2,936 | 1,679 | 48 |
| 1997 | 2 | ^e | ^e | 1996–97 | 38 | 22 | 13 | 1,617 | 745 | 57 |
| 1998 | 5 | 984 | 2,349 | 1997–98 | 94 | 73 | 64 | 20,327 | 8,622 | 135 |
| 1999 | 5 | 2,714 | 7,041 | 1998–99 | 95 | 80 | 71 | 10,651 | 7,533 | 106 |
| 2000 | 10 | 3,045 | 7,894 | 1999–00 | 98 | 64 | 52 | 9,816 | 5,723 | 107 |
| 2001 | 3 | 1,098 | 2,943 | 2000–01 | 50 | 27 | 12 | 366 | 256 | 21 |
| 2002 | 11 | 2,591 | 6,860 | 2001–02 | 114 | 101 | 67 | 8,805 | 3,669 | 55 |
| 2003 | 13 | 6,853 | 16,827 | 2002–03 | 107 | 73 | 64 | 9,052 | 4,140 | 65 |
| 2004 ^f | 2 | 522 | 1,293 | 2003–04 | 96 | 77 | 41 | 1,775 | 1,181 | 29 |
| 2005 | 4 | 2,121 | 5,619 | 2004–05 ^g | 170 | 102 | 60 | 6,496 | 3,973 | 66 |
| 2006 | 1 | ^e | ^e | 2005–06 | 98 | 97 | 67 | 2,083 | 1,239 | 18 |
| 2007 | 8 | 3,313 | 8,023 | 2006–07 | 129 | 127 | 116 | 21,444 | 10,690 | 92 |
| 2008 | 9 | 5,796 | 14,676 | 2007–08 | 139 | 137 | 108 | 18,621 | 9,485 | 88 |
| 2009 | 7 | 4,951 | 12,348 | 2008–09 | 105 | 105 | 70 | 6,971 | 4,752 | 68 |
| 2010 | 10 | 4,834 | 12,028 | 2009–10 | 125 | 123 | 85 | 9,004 | 7,044 | 83 |
| 2011 | 9 | 3,365 | 8,669 | 2010–11 | 148 | 148 | 95 | 9,183 | 6,640 | 70 |
| 2012 | 35 | 9,157 | 24,142 | 2011–12 | 204 | 204 | 138 | 11,341 | 7,371 | 53 |
| 2013 | 26 | 22,639 | 62,179 | 2012–13 | 149 | 148 | 104 | 21,752 | 7,662 | 74 |
| Avg 1990–2012 | 11 | 3,620 | 9,486 | Avg 1990–2012 | 116 | 97 | 72 | 8,928 | 5,506 | 71 |

^a Fishing may occur from November 15 to May 15.

^b The winter subsistence fishery is open December through May.

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

^d The number of crab harvested is the number of crab retained.

^e Confidential under AS 16.05.815.

^f Confidentiality was waived by the fishermen.

^g Permits were only given out of the Nome ADF&G office, except during the 2004–2005 season, when permits were also given out in Elim, Golovin, Shaktoolik, and White Mountain.

Appendix E6.—Summer subsistence red king crab harvests, Norton Sound, Eastern Bering Sea, 2004–2013.

| Year | Number Permits Issued | Number Permits Returned | Number Permits Fished | Total Crab Caught | Total Crab Harvested | Average Number Kept/Permits Fished |
|----------------|-----------------------|-------------------------|-----------------------|-------------------|----------------------|------------------------------------|
| 2004 | 38 | 18 | 5 | 996 | 350 | 70 |
| 2005 | 14 | 12 | 4 | 753 | 304 | 76 |
| 2006 | 6 | 4 | 3 | 67 | 62 | 21 |
| 2007 | 19 | 19 | 5 | 1,425 | 1,008 | 202 |
| 2008 | 30 | 30 | 14 | 1,816 | 1,176 | 84 |
| 2009 | 20 | 20 | 13 | 1,874 | 653 | 50 |
| 2010 | 27 | 27 | 15 | 1,086 | 660 | 44 |
| 2011 | 43 | 42 | 27 | 4,026 | 2,658 | 98 |
| 2012 | 45 | 44 | 13 | 1,346 | 912 | 70 |
| 2013 | 47 | 46 | 26 | 3,102 | 1,865 | 72 |
| Avg. 2008–2012 | 33 | 33 | 16 | 2,030 | 1,212 | 69 |

Appendix E7.—Number of crab pots lost during the subsistence and commercial winter crab fisheries and ADF&G winter studies, 2006–2013.

| Year | Subsistence | Commercial | ADF&G Winter Study | Total |
|---------|-------------|------------|--------------------------|-------|
| 2005–06 | 50 | ND | 6 | 56 |
| 2006–07 | 132 | ND | 7 | 139 |
| 2007–08 | 6 | ND | 4 | 10 |
| 2008–09 | 8 | ND | 2 | 10 |
| 2009–10 | 23 | 30 | 2 | 55 |
| 2010–11 | 8 | 3 | 0 | 11 |
| 2011–12 | 19 | 64 | 0 | 83 |
| 2012–13 | 4 | 23 | No winter study in 2013. | 27 |

Appendix E8.—Size composition by percent of red king crab from winter research pots near Nome, Norton Sound, Eastern Bering Sea, 1990–2012.

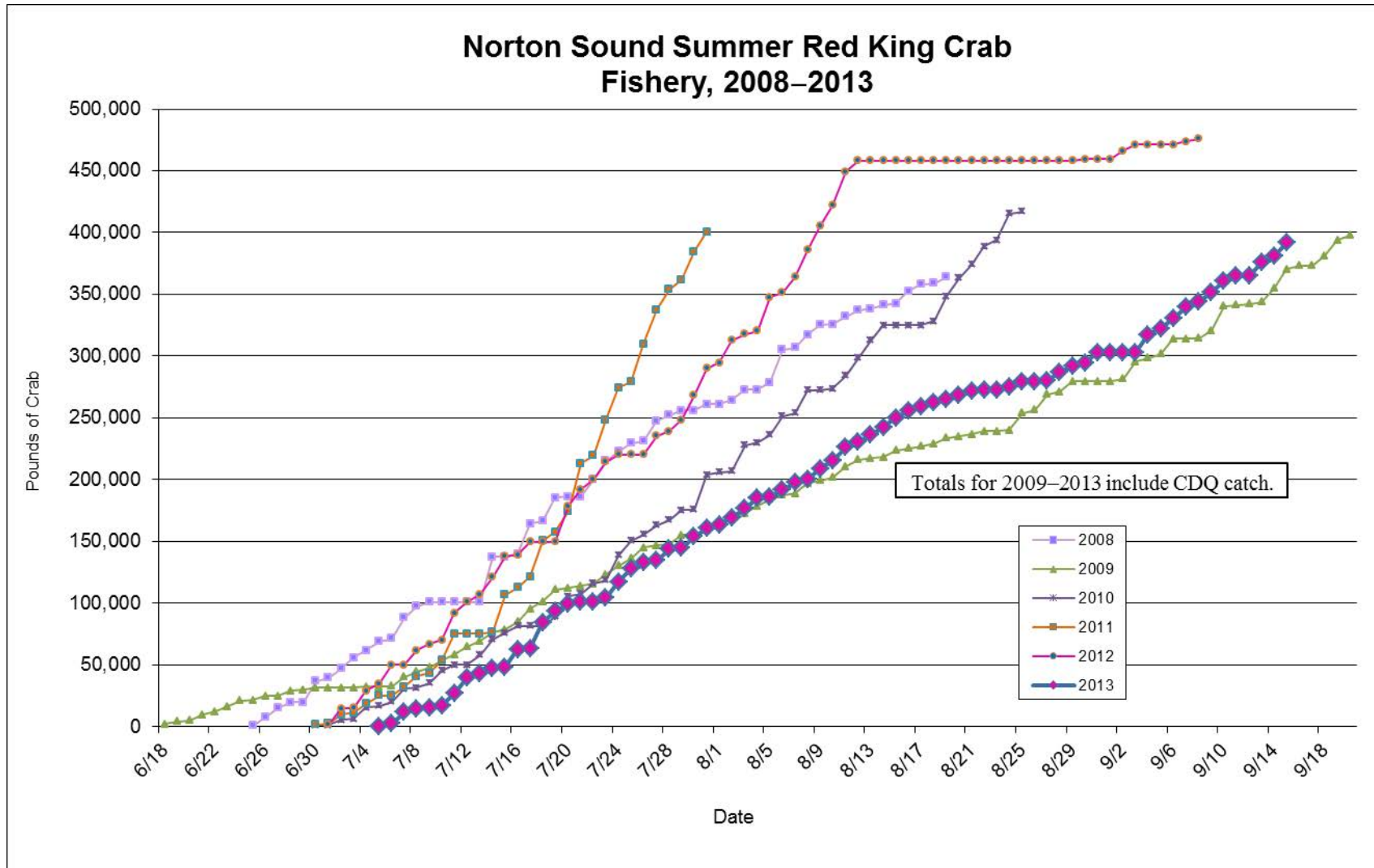
| Year | Undersized ^a | | | Legal ^a | | |
|------|-------------------------|-----------------|-----------------|--------------------|------------------|--------------|
| | Prerecruit 2 | Prerecruit 1 | Total | Recruits | Post recruits | Total |
| 1990 | 16 | 33 | 49 | 25 | 26 | 51 |
| 1991 | 5 | 30 | 36 | 34 | 31 | 65 |
| 1992 | ^b | ^b | ^b | ^b | ^b | ^b |
| 1993 | 3 | 9 | 12 | 17 | 71 | 88 |
| 1994 | ^b | ^b | ^b | ^b | ^b | ^b |
| 1995 | 10 | 11 | 23 ^c | 32 | 45 | 77 |
| 1996 | 22 | 33 | 64 ^c | 10 | 26 | 36 |
| 1997 | 32 | 21 | 64 ^c | 14 | 22 | 36 |
| 1998 | 36 | 44 | 82 ^c | 9 | 9 | 18 |
| 1999 | 7 | 42 | 50 ^c | 39 | 11 | 50 |
| 2000 | 16 | 20 | 37 ^c | 39 | 25 | 64 |
| 2001 | 23 | 16 | 39 ^c | 14 | 48 | 61 |
| 2002 | 43 | 26 | 79 ^c | 9 | 12 | 21 |
| 2003 | 20 | 42 | 66 ^c | 20 | 14 | 34 |
| 2004 | 9 | 40 | 50 ^c | 37 | 13 | 50 |
| 2005 | 16 | 24 | 41 ^c | 25 | 34 | 59 |
| 2006 | 29 | 33 | 63 ^c | 16 | 22 | 38 |
| 2007 | 16 | 53 | 78 ^c | 11 | 11 | 22 |
| 2008 | 36 | 31 | 71 ^c | 18 | 12 | 30 |
| 2009 | 11 | 42 | 54 ^c | 24 | 22 | 46 |
| 2010 | 10 | 32 | 43 ^c | 30 | 27 | 57 |
| 2011 | 15 | 26 | 44 ^c | 23 | 33 | 56 |
| 2012 | 25 | 29 | 57 ^c | 14 | 29 | 43 |

Note: No winter study occurred in 2013.

^a Undersized crab are male crab less than 4-³/₄ inch carapace width (CW). Legal crab are male king crab greater than or equal to 4-³/₄ inch CW.

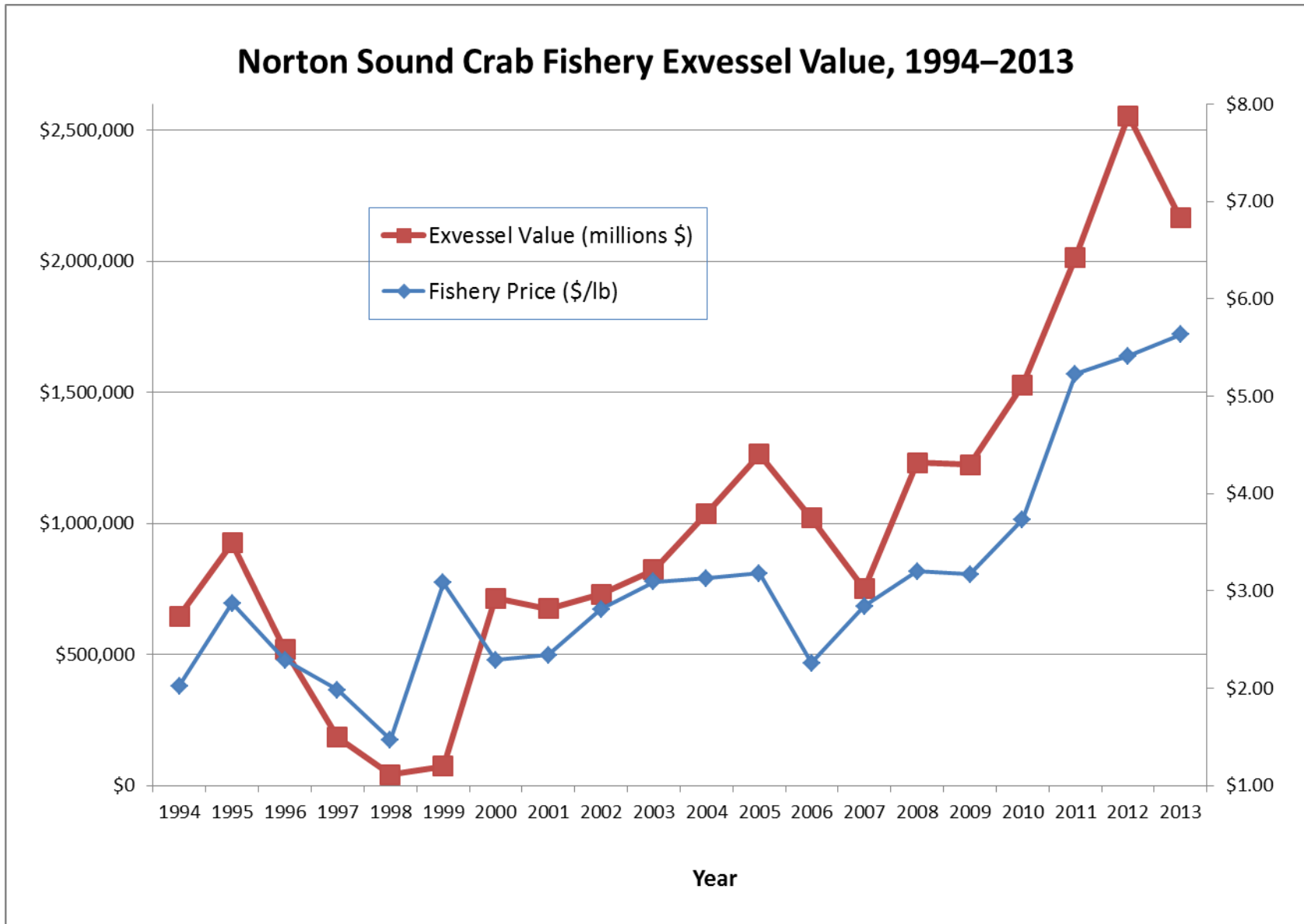
^b No winter crab research study occurred in 1992 or 1994.

^c Includes prerecruit 3.

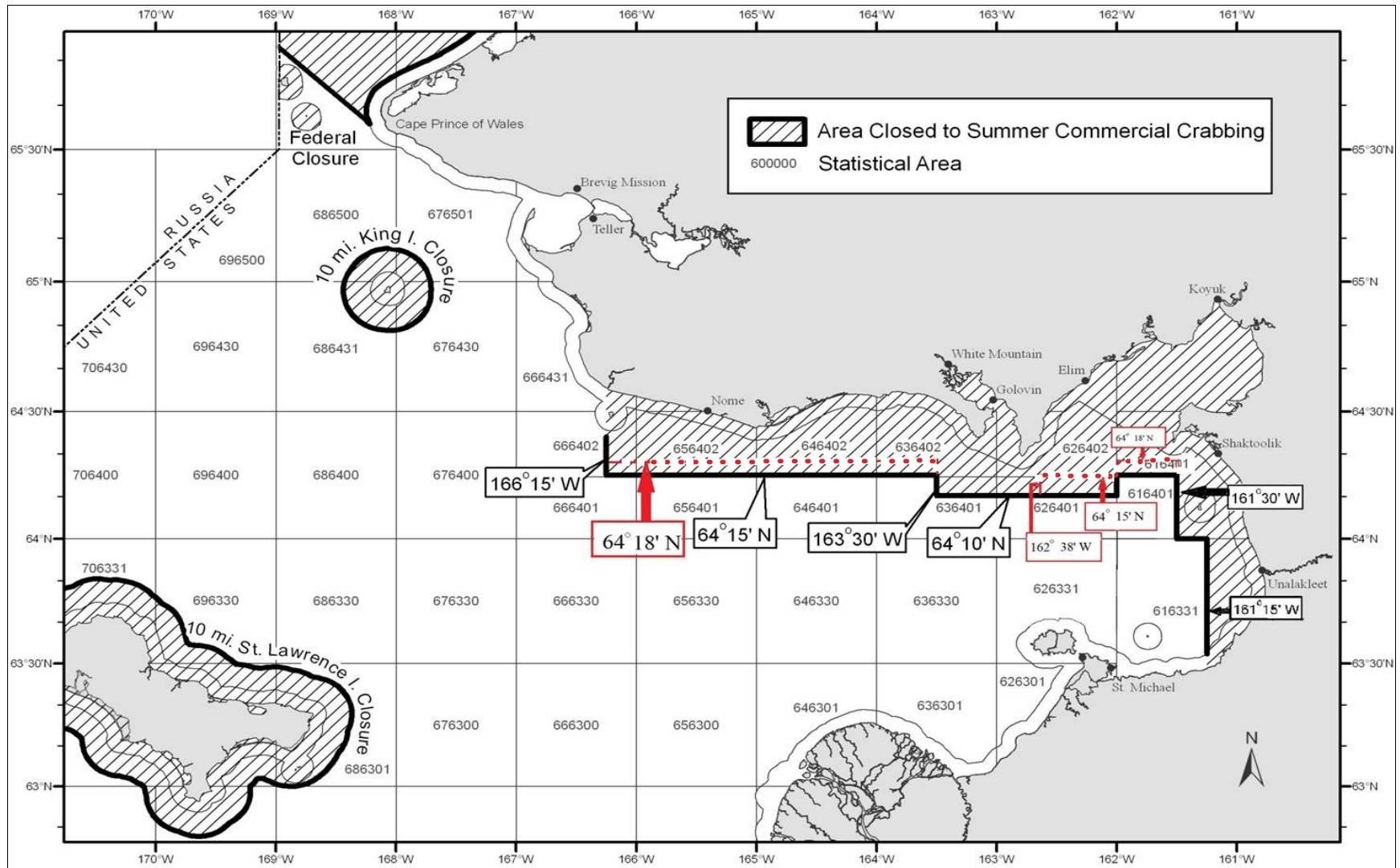


Appendix E9.—Current and historical catch performance for the Norton Sound summer commercial crab fishery, 2008–2013.

Note: CDQ catch is not included in years prior to 2009 because the open access and CDQ portions of the crab fishery did not occur concurrently in those years.

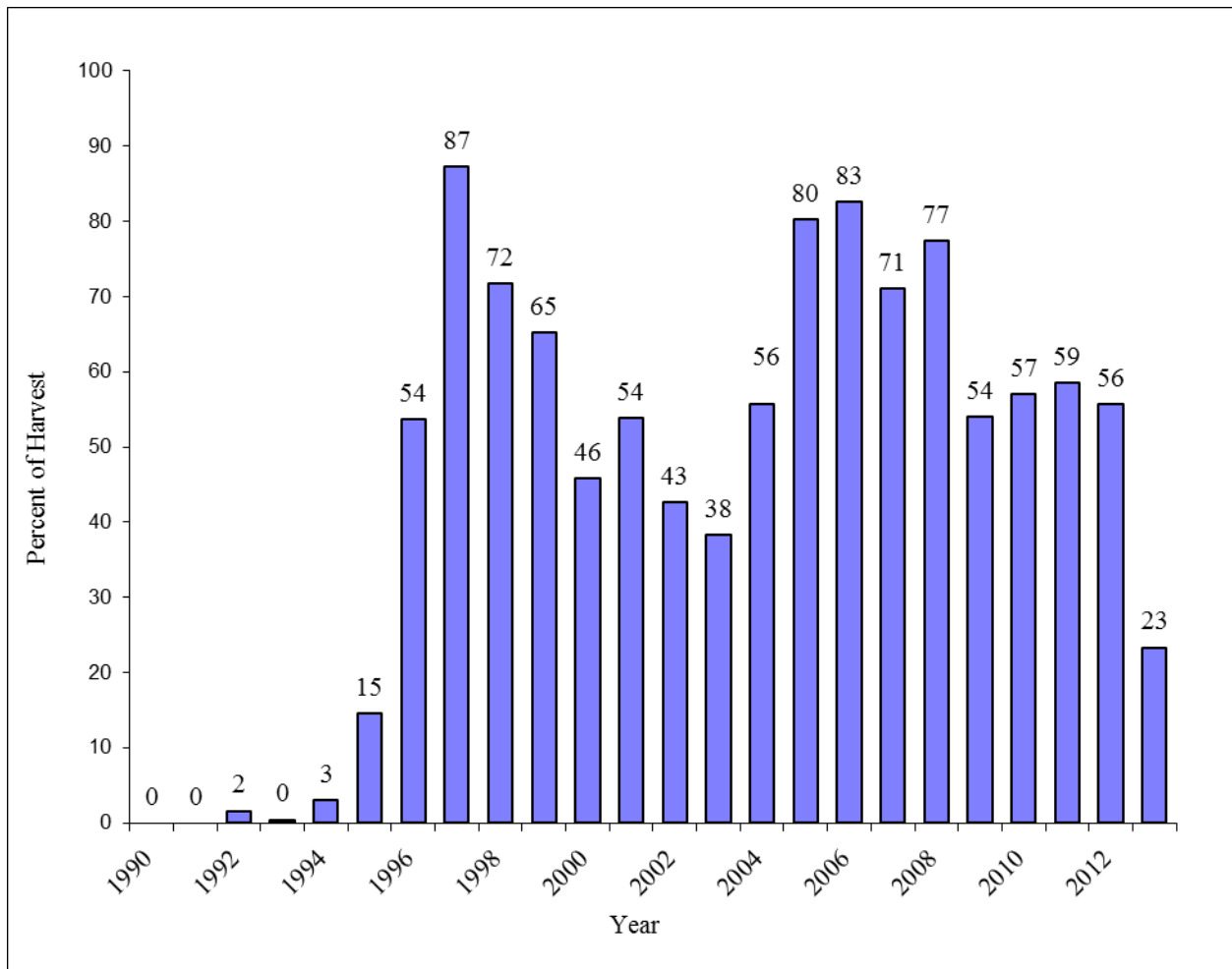


Appendix E10.—Norton Sound crab exvessel value and fishery price per pound, 1994–2013.

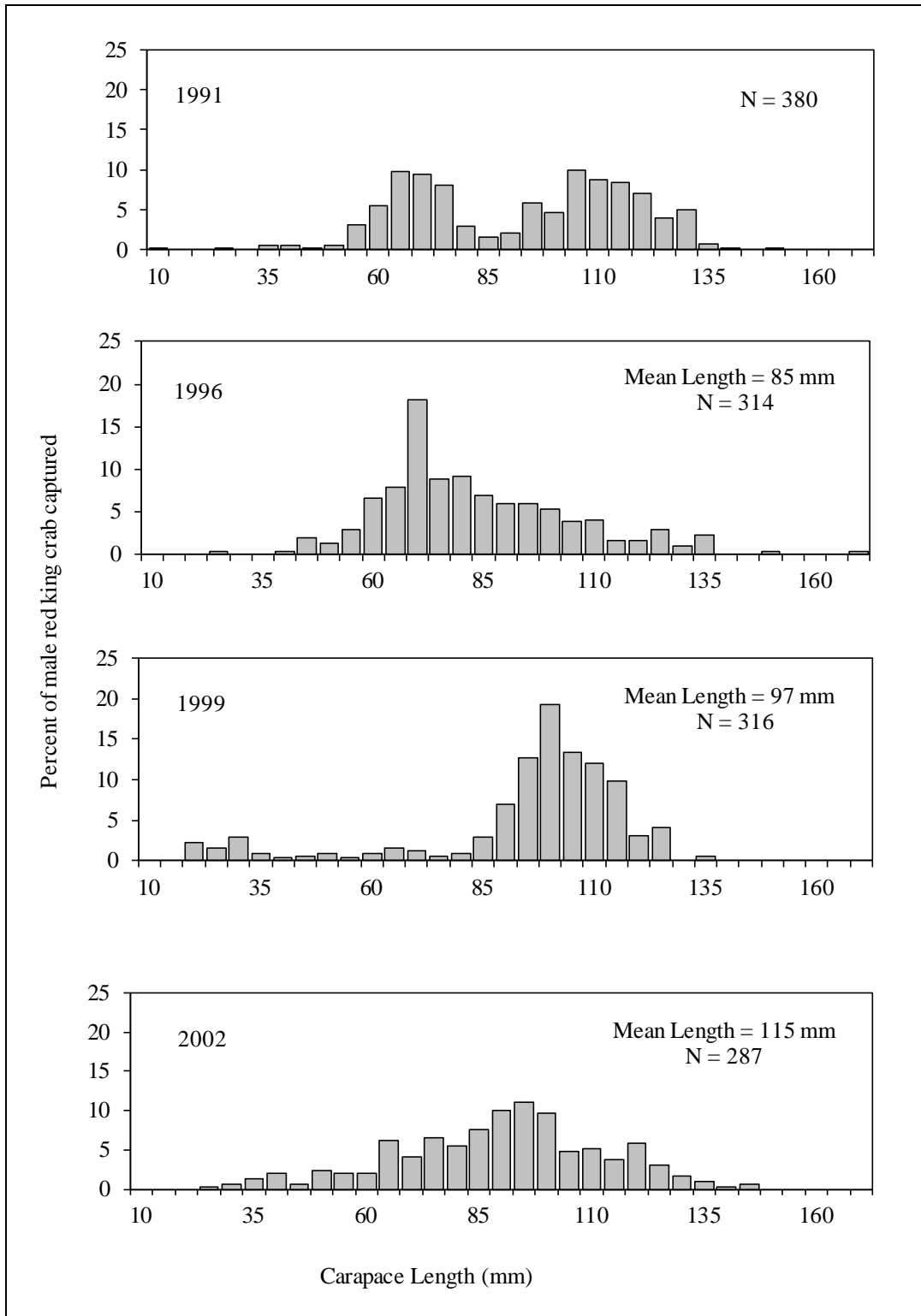


Appendix E11.—Closed water regulations in effect for the Norton Sound summer commercial crab fishery, with dotted line showing temporary boundaries for 2013 fishery only.

Note: Line drawn around the coastline delineates the 3-mile state waters zone.

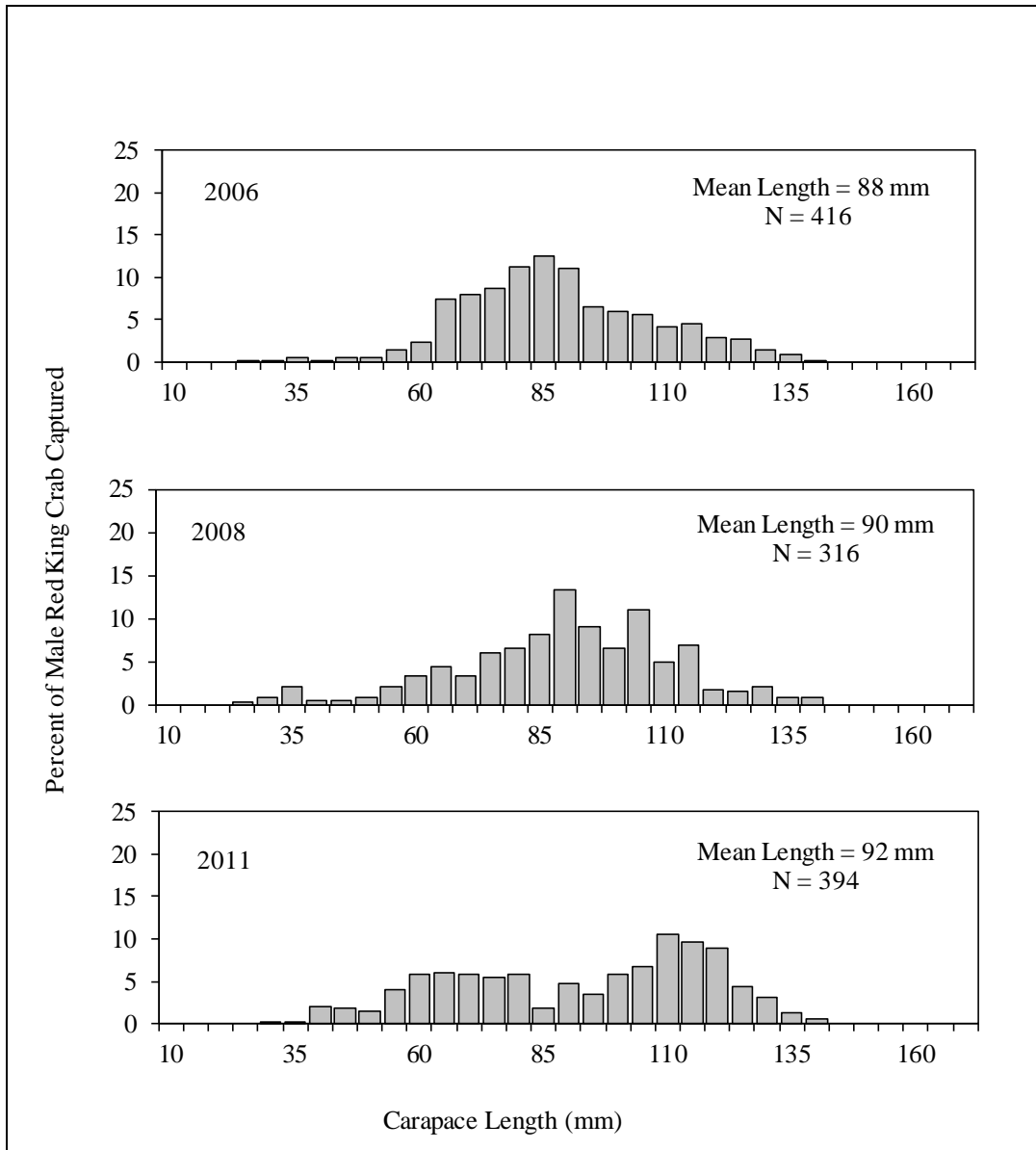


Appendix E12.—The percent of crab harvested during the Norton Sound summer commercial red king crab fishery east of 164° W longitude, 1990–2013.

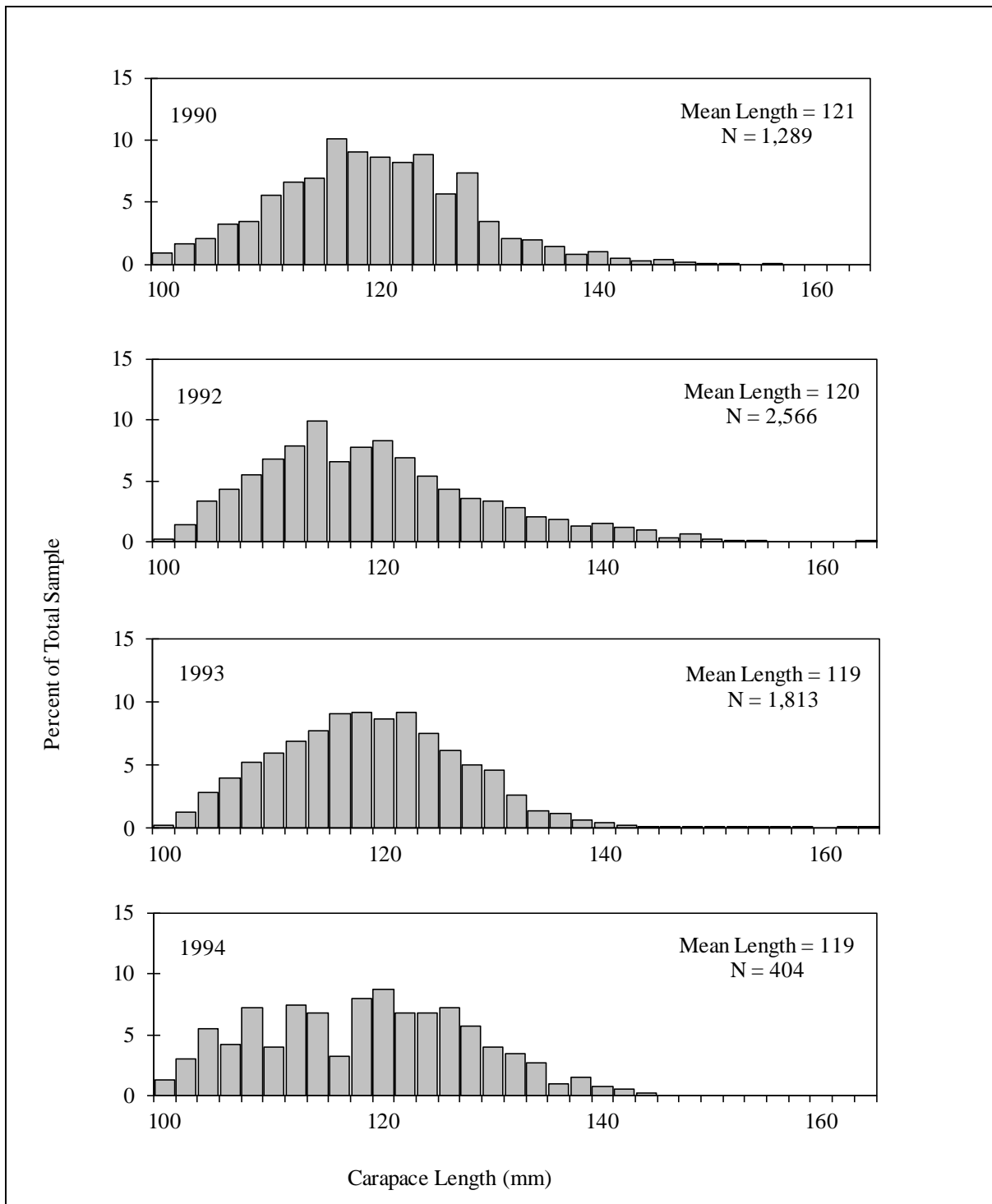


Appendix E13.–Norton Sound male red king crab size distribution from trawl assessment surveys conducted by the National Marine Fisheries Service in 1991, and by ADF&G in 1996, 1999, and 2002.

Note: Mean length information is not available for 1991.

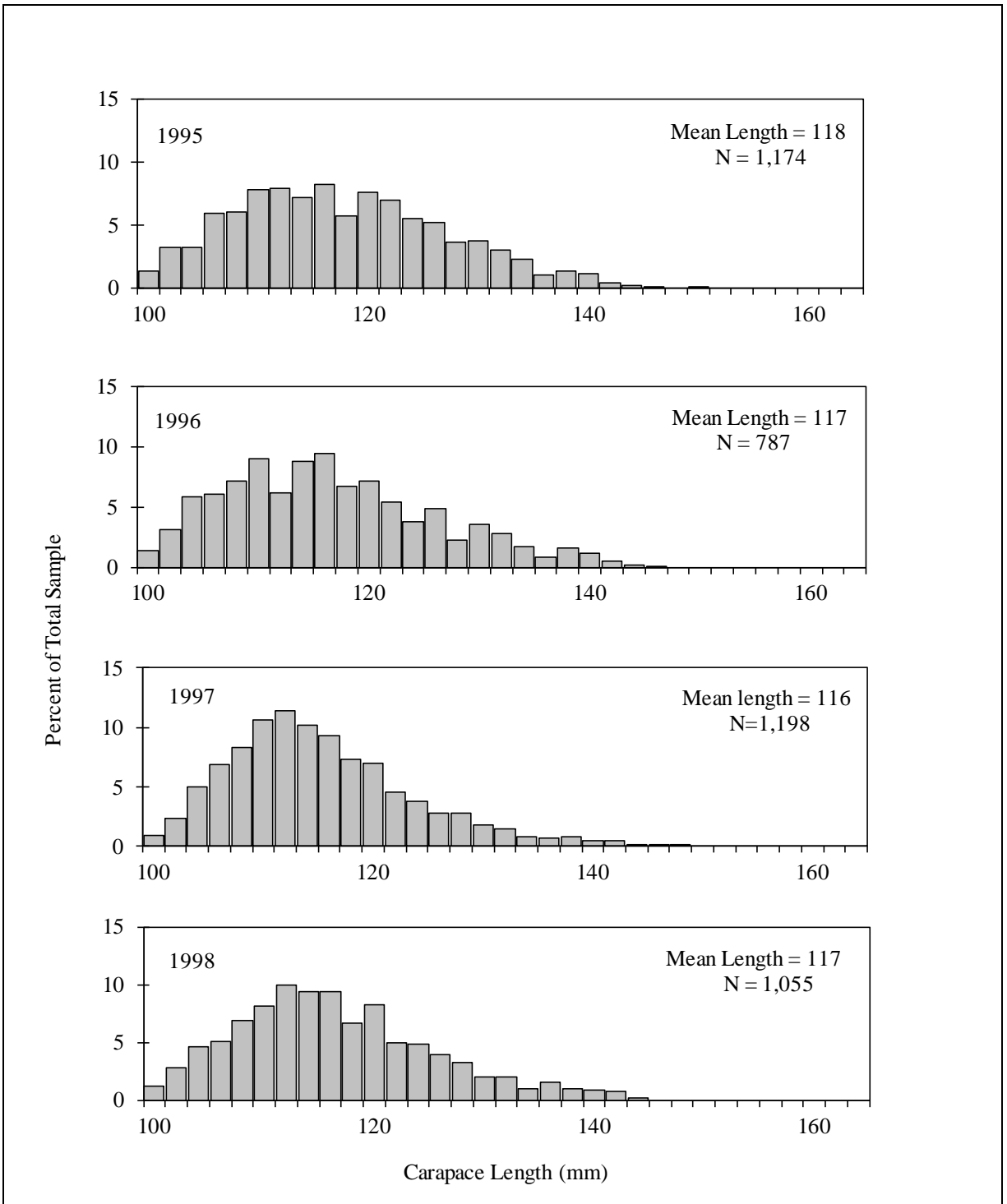


Appendix E14.—Norton Sound male red king crab size distribution from trawl assessment surveys conducted by ADF&G in 2006, 2008, and 2011.

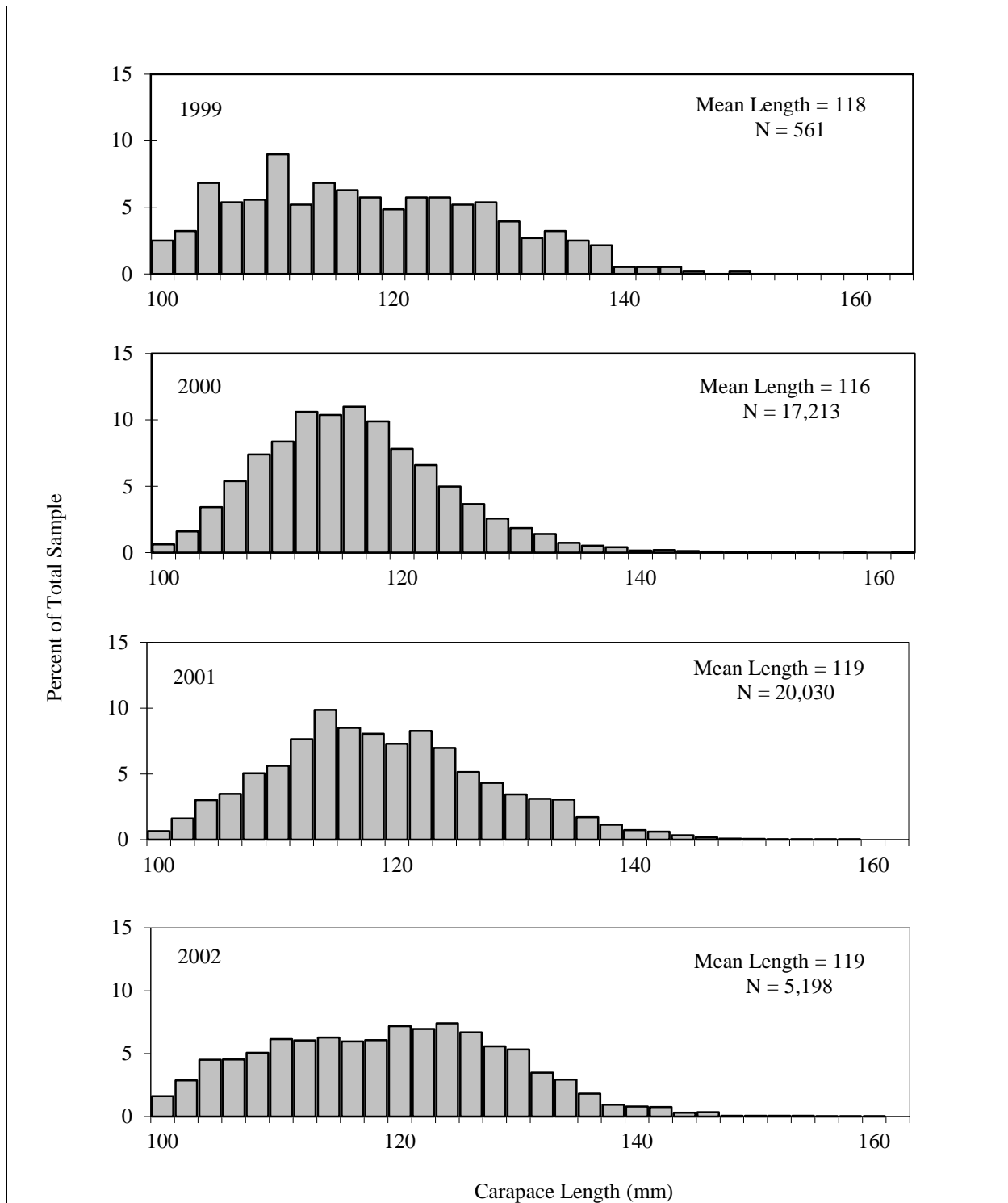


Appendix E15.—Length composition of Norton Sound red king crab summer commercial harvests, 1990–1994.

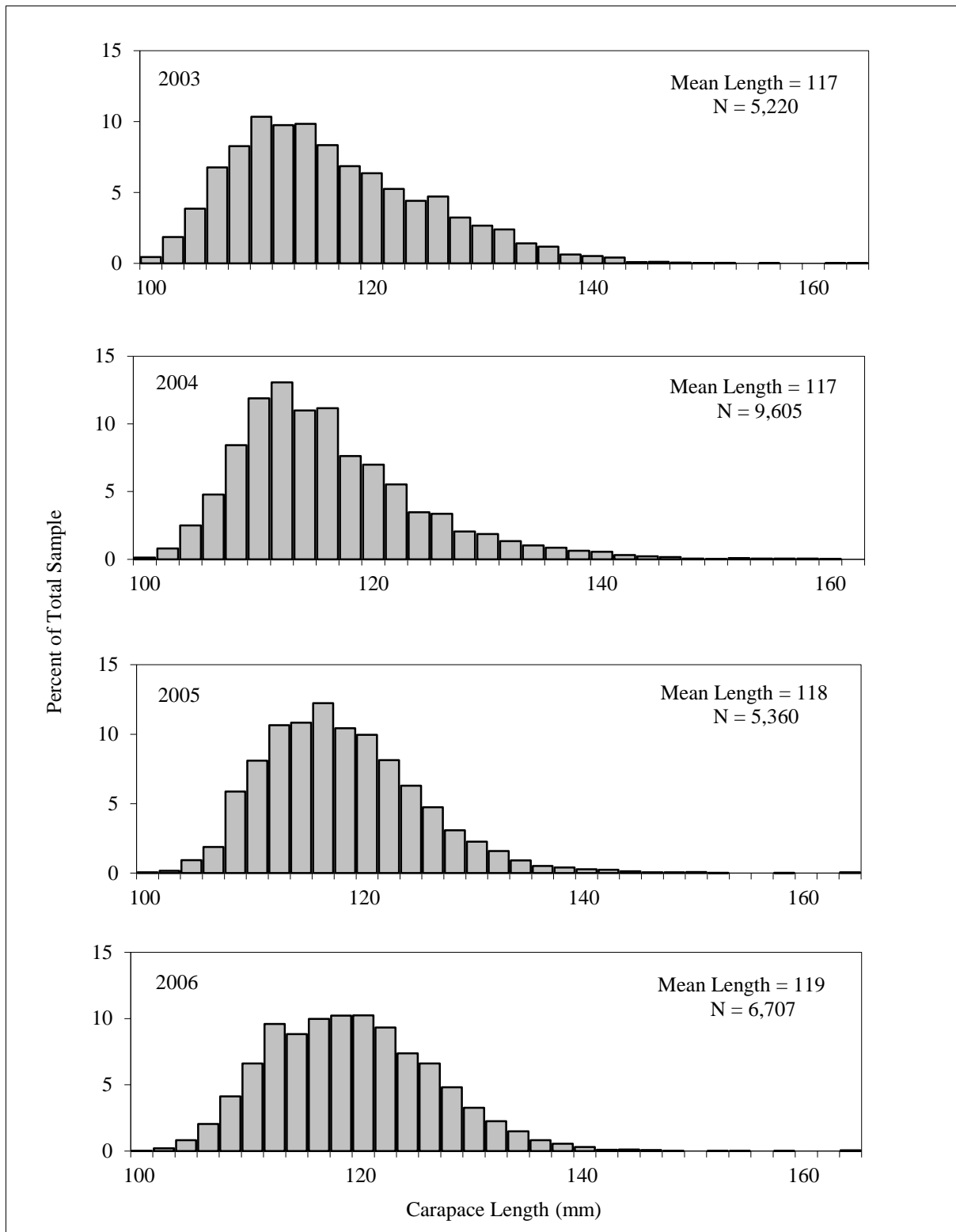
Note: No fishery in 1991.



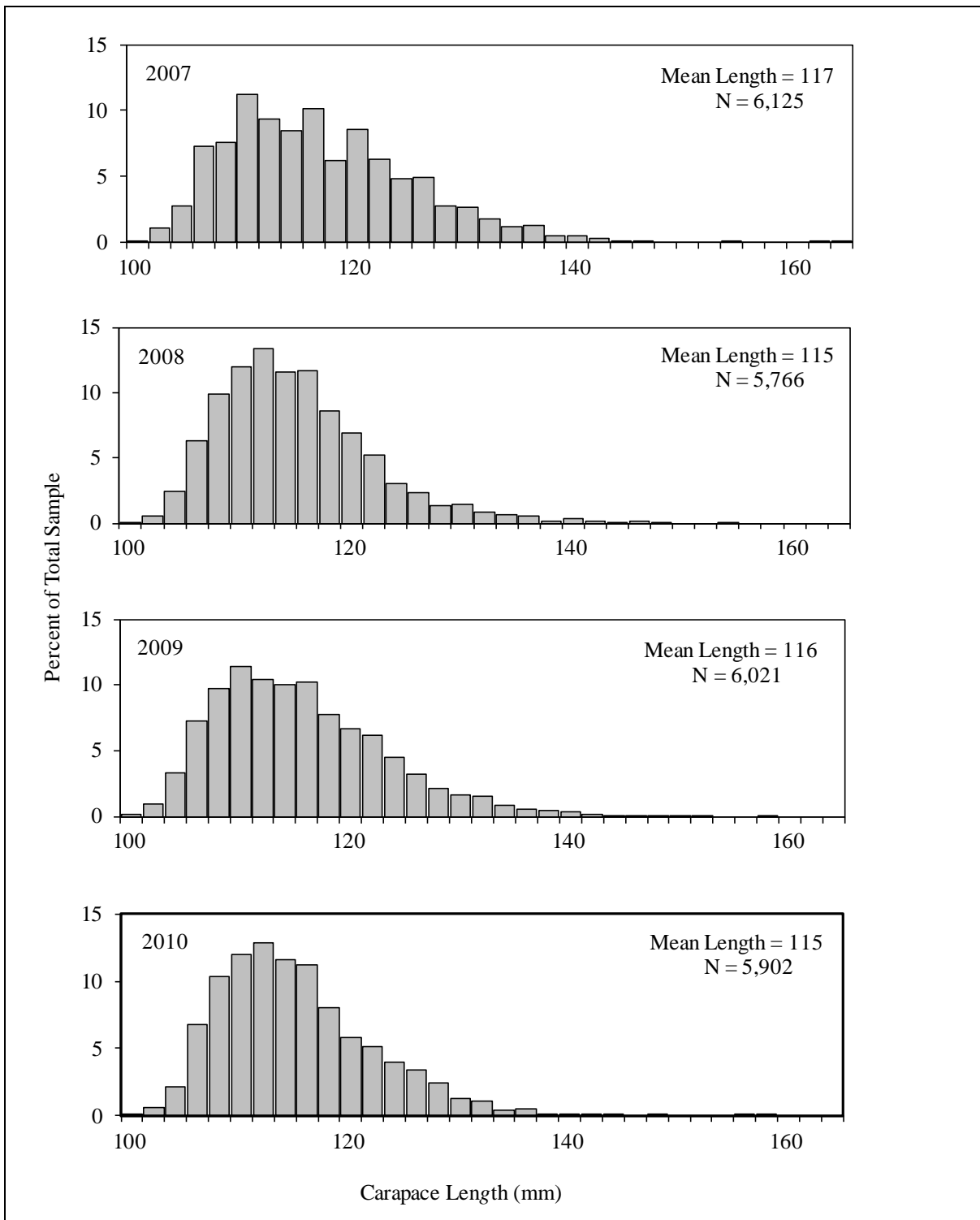
Appendix E16.—Length composition of Norton Sound red king crab summer commercial harvests, 1995–1998.



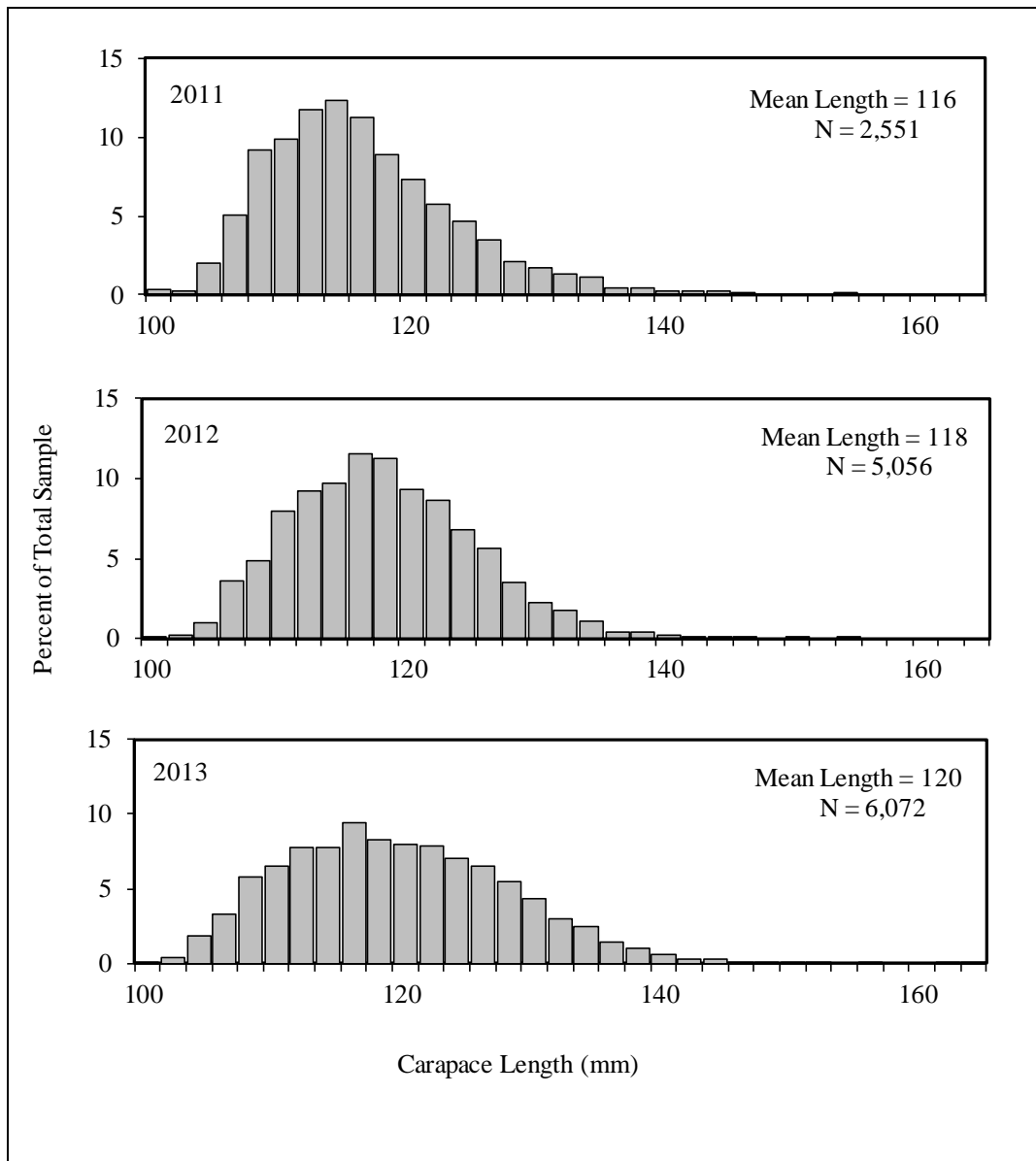
Appendix E17.—Length composition of Norton Sound red king crab summer commercial harvests, 1999–2002.



Appendix E18.—Length composition of Norton Sound red king crab summer commercial harvests, 2003–2006.



Appendix E19.—Length composition of Norton Sound red king crab summer commercial harvests, 2007–2010.



Appendix E20.—Length composition of Norton Sound red king crab summer commercial harvests, 2011–2013.

APPENDIX F: MISCELLANEOUS FISHERIES

Appendix F1.–Kotzebue District winter commercial sheefish harvest statistics, 1990–2013.

| Year ^b | Number of Fishermen | Number of Fish | Pounds ^a | | Price per Pound (\$) | Estimated Value (\$) |
|------------------------|---------------------|------------------|------------------------------|---------|----------------------|----------------------|
| | | | Total | Average | | |
| 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 | 1 | 37 | 474 | 12.8 | 1.91 | 905 |
| 2005 ^f | | | All Information Confidential | | | |
| 2006–2011 ^e | | | All Information Confidential | | | |
| 2012 ^f | | | All Information Confidential | | | |
| 2013 ^e | | | All Information Confidential | | | |

^a Data are not exact; in some instances total catch poundage was determined from average weight and catch data. Similarly, various price-per-pound figures were determined from price-per-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 is not always reported. Estimates were based on average weight from reported sales that documented the number of fish.

^e No reported commercial catches.

^f Less than 4 deliveries; data confidential under Alaska Statute 16.05.815. Prior to 2005, confidentiality was waived by permit holders.

Appendix F2.–Kotzebue District reported subsistence harvests of sheefish, 1991–2004 and 2012–2013.

| Year ^a | Number of fishermen interviewed | Reported harvest | Average catch per fisherman |
|-------------------|----------------------------------|--------------------|-----------------------------|
| 1991 | 40 | 2,180 | 55 |
| 1992 | 43 | 2,821 | 66 |
| 1993 | 46 | 2,441 | 53 |
| 1994 | 171 | 3,181 | 19 |
| 1995 ^b | 314 | 9,465 | 30 |
| 1996 ^b | 389 | 6,953 | 18 |
| 1997 ^b | 338 | 9,805 | 25 |
| 1998 ^b | 435 | 5,350 | 14 |
| 1999 ^b | 191 | 8,256 | 19 |
| 2000 ^b | 237 | 7,446 | 17 |
| 2001 ^b | 363 | 3,838 | 9 |
| 2002 | 101 | 3,882 | 38 |
| 2003 | 488 | 7,823 ^c | 0 |
| 2004 ^d | 440 | 10,163 | 23 |
| 2012 ^d | 360 | 11,693 | 32 |
| 2013 | Information is not yet available | | |

Note: Subsistence surveys were not conducted from 2005 to 2011.

^a 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 Subsistence sheefish harvests are from villages on Kobuk River.

^c Includes 10 fish reported from commercial salmon fishery and used for subsistence.

^d Subsistence surveys were not conducted in the town of Kotzebue.

Appendix F3.–Non-salmon sport fish harvests in Norton Sound and Kotzebue/Chukchi Sea, 1990–2013.

| Year | Norton Sound | | Kotzebue / Chukchi Sea | | |
|-----------|--------------|-----------------|------------------------|-----------------|------------------|
| | Dolly Varden | Arctic Grayling | Dolly Varden | Arctic Grayling | Inconnu/Sheefish |
| 1990 | 3,765 | 1,378 | 806 | 622 | 151 |
| 1991 | 10,365 | 5,121 | 1,149 | 1,981 | 603 |
| 1992 | 2,382 | 492 | 582 | 968 | 1,904 |
| 1993 | 5,907 | 1,584 | 914 | 916 | 1,029 |
| 1994 | 3,071 | 1,331 | 2,365 | 814 | 564 |
| 1995 | 2,908 | 1,037 | 939 | 910 | 1,142 |
| 1996 | 4,285 | 1,485 | 913 | 2,136 | 485 |
| 1997 | 4,467 | 1,262 | 598 | 1,903 | 906 |
| 1998 | 2,240 | 298 | 440 | 1,788 | 414 |
| 1999 | 6,708 | 1,600 | 796 | 1,247 | 635 |
| 2000 | 7,952 | 1,203 | 1,599 | 1,233 | 1,201 |
| 2001 | 3,174 | 994 | 1,693 | 1,244 | 1,305 |
| 2002 | 2,252 | 1,565 | 1,884 | 1,994 | 500 |
| 2003 | 5,531 | 1,778 | 533 | 1,473 | 2,509 |
| 2004 | 4,318 | 824 | 1,285 | 1,983 | 1,634 |
| 2005 | 2,617 | 595 | 239 | 269 | 393 |
| 2006 | 3,180 | 419 | 2,328 | 760 | 810 |
| 2007 | 2,808 | 314 | 2,924 | 836 | 1,066 |
| 2008 | 3,319 | 965 | 852 | 293 | 61 |
| 2009 | 3,373 | 1,185 | 1,406 | 445 | 957 |
| 2010 | 1,835 | 232 | 493 | 366 | 595 |
| 2011 | 4,041 | 1,398 | 865 | 486 | 385 |
| 2012 | 252 | 520 | 781 | 626 | 104 |
| 2013 | 1,184 | 500 | 1,074 | 563 | 218 |
| Average | | | | | |
| 2008–2012 | 2,564 | 860 | 879 | 443 | 420 |
| 2003–2012 | 3,127 | 823 | 1,171 | 754 | 851 |

Appendix F4.–Kotzebue District incidentally caught and sold Dolly Varden during the commercial salmon fishery, 1990–2013.

| Year | Number of fish sold | Estimated Total catch ^a | Pounds sold | Average weight ^b | Average price |
|------|---------------------|------------------------------------|-------------|-----------------------------|---------------|
| 1990 | 604 | c | 4,219 | 7.0 | 0.25 |
| 1991 | 6,136 | c | 40,747 | 6.6 | 0.18 |
| 1992 | 1,977 | c | 11,951 | 6.0 | 0.10 |
| 1993 | 76 | c | 540 | 7.1 | 0.10 |
| 1994 | 149 | c | 767 | 5.1 | 0.17 |
| 1995 | 2,090 | c | 13,195 | 6.3 | 0.20 |
| 1996 | 188 | c | 1,153 | 6.1 | 0.25 |
| 1997 | 3,320 | c | 23,203 | 7.0 | 0.20 |
| 1998 | 349 | c | 2,640 | 7.6 | 0.20 |
| 1999 | 1,502 | c | 11,352 | 7.6 | 0.20 |
| 2000 | 7 | c | 44 | 6.3 | 0.20 |
| 2001 | 0 | c | 0 | d | 0.00 |
| 2002 | 0 | 30 | 0 | d | 0.00 |
| 2003 | 20 | 176 | 160 | 8.0 | 0.50 |
| 2004 | 124 | c | 846 | 6.8 | 0.26 |
| 2005 | 181 | c | 1,158 | 6.4 | 0.30 |
| 2006 | 0 | 278 | 0 | d | 0.00 |
| 2007 | 0 | 960 | 0 | d | 0.00 |
| 2008 | 0 | 1,629 | 0 | d | 0.00 |
| 2009 | 0 | 960 | 0 | d | 0.00 |
| 2010 | 0 | 1,323 | 0 | d | 0.00 |
| 2011 | 0 | 400 | 0 | d | 0.00 |
| 2012 | 0 | 300 | 0 | d | 0.00 |
| 2013 | 0 | 302 | 0 | d | 0.00 |

^a Estimate includes fish caught but not sold based on interviews of fishermen or fish tickets.

^b Some data extrapolated from average reported weight.

^c No estimates were made of Dolly Varden caught but not sold.

^d Dolly Varden caught but not sold were not weighed.

Appendix F5.—Subsistence harvests of Dolly Varden from the villages of Kivalina and Noatak, 1991–2013.

| Year ^a | Kivalina | | Noatak ^{b,c} |
|-------------------|----------------------------------|--------|-----------------------|
| | Number | Pounds | Number |
| 1991 | | | 4,814 |
| 1992 | | | 4,395 |
| 1993 | | | 4,275 |
| 1995 | | | 5,762 |
| 1996 | | | 5,031 |
| 1997 | | | 4,763 |
| 1998 | | | 3,872 |
| 2000 | | | 3,315 |
| 2001 | | | 2,702 |
| 2002 | | | 3,242 |
| 2003 | | | 6,386 |
| 2004 | | | 11,697 |
| 2007 | 20,527 | 67,739 | 10,234 |
| 2012 | | | 6,437 |
| 2013 | Information is not yet available | | |

Note: Data are not available for all years.

^a Subsistence surveys were not conducted in 1994, 1999, 2005–2006, and 2008–2011. The Division of Subsistence did a comprehensive survey of Noatak fish harvests in 2012 and of both villages in 2013, but data are not yet available for 2013.

^b No data are available on poundage.

^c Based on ADF&G, Division of Subsistence, household surveys in Noatak.

Appendix F6.—Dolly Varden sport fish harvests in Norton Sound, by river, 1990–2013.

| Year | Location | | | | | | | | | Total |
|-----------|--------------|-------|---------|------------|--------------|-------|-------|---------|---------------|--------|
| | Marine Water | Nome | Pilgrim | Unalakleet | Fish-Niukluk | Sinuk | Snake | Solomon | Other Streams | |
| 1990 | 183 | 1,078 | 166 | 614 | 348 | | | | 1,227 | 3,616 |
| 1991 | 0 | 1,220 | 856 | 1,474 | 1,474 | 729 | 1,252 | 2,219 | 1,141 | 10,365 |
| 1992 | 204 | 557 | 131 | 746 | 270 | 139 | 115 | 131 | 89 | 2,382 |
| 1993 | 205 | 917 | 448 | 427 | 1,003 | 536 | 331 | 893 | 1,147 | 5,907 |
| 1994 | 90 | 431 | 63 | 410 | 699 | 305 | 117 | 197 | 759 | 3,071 |
| 1995 | 0 | 462 | 74 | 976 | 346 | 158 | 131 | 366 | 395 | 2,908 |
| 1996 | 12 | 873 | 388 | 1,506 | 402 | 485 | 97 | 49 | 473 | 4,285 |
| 1997 | 189 | 328 | 65 | 936 | 2,071 | 346 | 81 | 186 | 265 | 4,467 |
| 1998 | 0 | 302 | 14 | 588 | 160 | 311 | 0 | 383 | 482 | 2,240 |
| 1999 | 330 | 791 | 45 | 2,384 | 1,952 | 88 | 44 | 154 | 920 | 6,708 |
| 2000 | 1,069 | 340 | 0 | 4,462 | 1,687 | 59 | 199 | 0 | 136 | 7,952 |
| 2001 | 166 | 43 | 270 | 1,002 | 1,197 | 86 | 108 | 162 | 140 | 3,174 |
| 2002 | 67 | 511 | 72 | 789 | 259 | 47 | 18 | 18 | 471 | 2,252 |
| 2003 | 0 | 1,223 | 482 | 134 | 110 | 712 | 13 | 0 | 2,857 | 5,531 |
| 2004 | 72 | 226 | 0 | 3,593 | 120 | 42 | 0 | 53 | 212 | 4,318 |
| 2005 | 95 | 553 | 12 | 500 | 1,148 | 141 | 27 | 0 | 141 | 2,617 |
| 2006 | 0 | 959 | 0 | 1,307 | 0 | 531 | 51 | 153 | 179 | 3,180 |
| 2007 | 14 | 625 | 0 | 731 | 193 | 144 | 461 | 481 | 159 | 2,808 |
| 2008 | 0 | 46 | 0 | 1,062 | 1,061 | 107 | 46 | 0 | 997 | 3,319 |
| 2009 | 0 | 253 | 0 | 2,794 | 108 | 50 | 50 | 0 | 118 | 3,373 |
| 2010 | 0 | 165 | 0 | 1,411 | 12 | 117 | 0 | 24 | 106 | 1,835 |
| 2011 | 0 | 0 | 11 | 2,219 | 1,631 | 0 | 10 | 0 | 170 | 4,041 |
| 2012 | 0 | 111 | 0 | 88 | 0 | 9 | 33 | 0 | 11 | 252 |
| 2013 | 0 | 17 | 0 | 483 | 0 | 0 | 0 | 0 | 684 | 1,184 |
| Average | | | | | | | | | | |
| 2008–2012 | 0 | 115 | 2 | 1,515 | 562 | 57 | 28 | 5 | 280 | 2,564 |
| 2003–2012 | 18 | 416 | 51 | 1,384 | 438 | 185 | 69 | 71 | 495 | 3,127 |

Note: Data are not available for all years.

Appendix F7.—Aerial survey counts of overwintering and spawning Dolly Varden in the Kotzebue District, 1990–2013.

| Year ^a | Noatak River spawner survey ^b | Overwintering | |
|-------------------|--|-----------------------------|--------------------------------|
| | | Wulik River ^c | Kivalina River ^c |
| 1990 | 7,261 | d | d |
| 1991 | 9,605 | 126,985 | 35,275 |
| 1992 | d | 135,135 | e |
| 1993 | 9,560 | 144,138 | 16,534 |
| 1994 | d | 66,752 | d |
| 1995 | 6,500 | 128,705 | 28,870 |
| 1996 | 12,184 | 61,005 | d |
| 1997 | d | 95,412 | d |
| 1998 | d | 104,043 | d |
| 1999 | 9,059 ^f | 70,704 | d |
| 2000 | d | d | d |
| 2001 | d | 92,614 | d |
| 2002 | d | 44,257 | d |
| 2003 | d | 1,500 ^g | d |
| 2004 | d | 101,806 | d |
| 2005 | d | 120,848 | d |
| 2006 | d | 108,352 | d |
| 2007 | d | 99,311 | d |
| 2008 | d | 71,493 | d |
| 2009 | d | 63,977 | d |
| 2010 | d | 36,866 | d |
| 2011 | d | 64,499 | d |
| 2012 | d | 21,084 | d |
| 2013 | d | 23,312 ^h | d |

^a Counts are considered minimal because data listed include both poor and good surveys.

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

^c Surveys conducted by Division of Sport Fish.

^d Not surveyed.

^e Poor weather hampered or prevented survey.

^f Poor conditions on the Nimiuktuk did not allow a count.

^g Spawning survey conducted very early (8/20/03).

^h Counting conditions were poor due to presence of river ice.

Appendix F8.—Subsistence whitefish catch and effort in the Kotzebue District, 1991–1993, 1997–2004, and 2012–2013.

| Year ^a | Number of fishermen interviewed | Number of whitefish harvested | Average catch per fisherman |
|-------------------|----------------------------------|-------------------------------|-----------------------------|
| 1991 ^b | 63 | 16,015 | 254 |
| 1992 ^b | 66 | 17,485 | 265 |
| 1993 ^b | 70 | 19,060 | 272 |
| 1997 | 413 ^c | 84,851 | 205 |
| 1998 | 435 ^c | 39,754 | 91 |
| 1999 | 191 ^c | 56,326 | 295 |
| 2000 | 237 ^c | 70,097 | 296 |
| 2001 | 363 ^c | 30,976 | 85 |
| 2002 | 101 ^d | 25,607 | 254 |
| 2003 | 446 | 73,242 | 164 |
| 2004 | 440 ^c | 50,501 | 115 |
| 2012 | 360 ^c | 41,229 | 115 |
| 2013 | Information is not yet available | | |

Note: Subsistence surveys were not conducted from 1994 to 1996 and from 2005 to 2011.

^a Whitefish harvest information was collected during chum salmon subsistence surveys and is considered a fraction of the annual catch. Whitefish numbers include all species of whitefish, except sheefish.

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

^c Subsistence harvest information is from Ambler, Kiana, Kobuk, Noatak, Noorvik, and Shungnak.

^d Subsistence harvest information is from Noatak and Noorvik.

Appendix F9.–Norton Sound District winter commercial whitefish harvest statistics, 2007–2013.

| Year ^a | Number of fishermen | Total pounds | Price per pound (\$) | Estimated value (\$) |
|------------------------|---------------------|--------------|----------------------|----------------------|
| 2006–2007 | 1 | 3,723 | 0.44 | 2,635 |
| 2007–2008 ^b | | | | |
| 2008–2009 ^b | | | | |
| 2009–2010 ^b | | | | |
| 2010–2011 | 1 | 2,009 | 0.50 | 1,005 |
| 2011–2012 | 1 | 2,148 | 0.50 | 859 |
| 2012–2013 | 2 | 105 | 0.50 | 53 |

^a Season was from September 15 to June 15. Confidentiality was waived by fishermen.

^b No reported sales.

Appendix F10.–Norton Sound District winter commercial saffron cod harvest statistics, 1994–1995 and 2010–2013.

| Year ^a | Number of fishermen | Total pounds | Price per pound (\$) | Estimated value (\$) |
|------------------------|---------------------|--------------|----------------------|----------------------|
| 1993–1994 | ^b | 1,402 | ^b | ^b |
| 1994–1995 | ^b | 52 | 0.50 | 26 |
| 2009–2010 ^c | 1 | 1,748 | 0.30 | 524 |
| 2010–2011 | 5 | 8,031 | 0.50 | 4,016 |
| 2011–2012 | 9 | 3,780 | 0.47 | 1,772 |
| 2012–2013 | 25 | 33,939 | 0.50 | 16,970 |

^a Season was from September 15 to June 15.

^b Information is not available.

^c Confidentiality was waived by the fisherman.

APPENDIX G: OVERVIEW OF 2013

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

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

Appendix G2.—Alaska Department of Fish and Game and associated cooperative studies conducted within the Norton Sound, Port Clarence, Kotzebue and Arctic Districts, 2013.

HERRING

Herring Test Fishing

- a) Location: Norton Sound ocean waters, with field camp at Cape Denbigh, and base camp in Unalakleet.
- b) Description: To determine age class composition through test fishing with variable mesh-gillnets and collection of commercial catch samples. Alaska Department of Fish and Game (ADF&G) project.

SALMON

Eldorado River Weir

- a) Location: Eldorado River, approximately 15 miles upstream from the Safety Sound highway bridge, and approximately 3 miles above the furthest upstream connecting channel to the Flambeau River.
- b) Description: Determine daily and seasonal timing and magnitude of chum and pink salmon escapements. Collect age, sex, and length data from chum salmon from weir trap. Cooperative project operated by NSEDC with assistance from ADF&G.

Glacial Lake Weir and Video Enumeration Project

- a) Location: At outlet of Glacial Lake.
- b) Description: Determine daily and seasonal timing and magnitude of sockeye salmon escapement. Compare aerial survey totals with weir counts in order to improve survey accuracy. Weir is cooperative project operated by ADF&G with assistance from NSEDC. Video project is operated by ADF&G.

Inglutalik River Tower

- a) Location: Inglutalik River, approximately 18 miles upstream from the mouth at Norton Bay.
- b) Description: Determine daily and seasonal timing and magnitude of Chinook, chum, pink, and coho salmon escapements. Collect age, sex, and length data from Chinook, chum, and coho salmon from beach seine. Cooperative project operated by NSEDC with assistance from ADF&G.

Kwiniuk River Tower

- a) Location: Kwiniuk River, approximately five miles upstream from mouth.
- b) Description: Determine daily and seasonal timing and magnitude of salmon escapements. Determine age, sex, and length of Chinook and chum salmon in the Kwiniuk River escapement from beach seining. ADF&G project with additional funding from NSEDC.

Nome River Weir

- a) Location: Nome River, approximately one mile upstream of the VOR site.
- b) Description: To determine daily and seasonal timing and magnitude of salmon escapement. Compare aerial survey totals with weir counts in order to improve survey accuracy. Collect age and sex data through escapement sampling of weir trap. ADF&G project with additional funding from NSEDC.

North River Tower

- a) Location: North River, approximately two miles below bridge.
- b) Description: Determine daily and seasonal timing and magnitude of salmon escapements. Cooperative project operated by NSEDC with assistance from ADF&G.

-continued-

Pilgrim River Weir

- a) Location: Pilgrim River, approximately six 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. Collect age, sex, and length data from weir trap. Cooperative project operated by NSEDC with assistance from ADF&G.

Snake River 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 salmon escapements. Cooperative project operated by ADF&G and NSEDC.

Solomon River Weir

- a) Location: Solomon River, at approximately mile 35.5 on the Nome–Council road.
- b) Description: Determine daily and seasonal timing and magnitude of salmon escapements. ADF&G project.

Unalakleet River Weir

- a) Location: Unalakleet River, approximately 15 miles upstream from village of Unalakleet.
- b) Description: Determine daily and seasonal timing and magnitude of Chinook, chum, and pink escapements. Collect age, sex, and length data from Chinook and chum salmon from weir trap. Cooperative ADF&G, BLM, NSEDC, and Unalakleet IRA project.

Kobuk River Test Fish

- a) Location: Lower Kobuk River, approximately two miles downriver of Kiana.
- b) Description: Evaluate chum salmon abundance migrating into the Kobuk River drainage using systematic drift gillnet catches and qualitatively assess the impact of the Kotzebue District commercial salmon fishery on chum abundance into the Kobuk River drainage for fisheries management purposes. Describe migratory timing in the lower Kobuk River. Sample for age, sex, and length. ADF&G project.

Salmon Lake Limnology Project / Sockeye Salmon Restoration

- a) Location: Salmon Lake, throughout; and smolt trap two miles downstream from lake, on Pilgrim River.
- b) Description: 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. Fertilization of Salmon Lake. NSEDC project.

Subsistence Salmon Fishing Surveys

- a) Location: Norton Sound District.
- b) Description: Determine subsistence utilization of salmon for formulating management procedures and goals. Subsistence salmon permits were issued in northern Norton Sound and Port Clarence District by Commercial Fisheries Division. Koyuk, Shaktoolik, and Unalakleet were also surveyed by Commercial Fisheries Division. ADF&G project.

-continued-

CRAB

Offshore Summer King Crab Study

- a) Location: Tagging occurred along transects 5 and 10 miles from shore from Cape Nome to Elim; observers were placed on commercial fishing vessels throughout the open fishing area of Norton Sound.
- b) Description: Investigate movement, size composition, potential essential habitat, and handling of red king crab in eastern Norton Sound. Cooperative project between ADF&G and NSEDC with funding provided by North Pacific Research Board.

Norton Sound Red King Crab Trawl Survey (conducted in 2011)

- 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 presence–absence data taken. Cooperative ADF&G and NSEDC project with financial assistance from the National Oceanic and Atmospheric Administration.
-

Appendix G3.—Commercial processors and buyers operating in Norton Sound and Kotzebue Sound, 2013.

| Company | Address | Type of Processing | District |
|---|--|---|----------------|
| Aqua Tech | P.O. Box 10119 Anchorage, AK 99510 | Fresh Crab | Norton Sound |
| Norton Sound Seafood Products | Nome, AK 99762 and Unalakleet, AK 99684 | Frozen/Fresh Salmon Herring Roe King Crab | Norton Sound |
| Great Pacific Seafoods | Anchorage, AK | Buy and Fly Frozen/Fresh Salmon | Kotzebue Sound |
| Maniilaq Services, Inc. dba Arctic Coast Wild Salmon | Seattle, WA 98101 | Buy and Fly Frozen/Fresh Salmon | Kotzebue Sound |

| | |
|--|---------------------|
| NORTON SOUND 2013 SUBSISTENCE SALMON HARVEST SURVEY | Community ID# 357 |
| Alaska Department of Fish and Game | Household ID# _____ |

| | |
|-----------------------|----------------------------------|
| Community: UNALAKLEET | |
| Survey Date: _____ | Household Size: _____ |
| Interviewer: _____ | (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) | |
|------------------------|--|--------------------------------|
| | SUBSISTENCE GILL NET or SEINE (Number of fish) | ROD & REEL (Number of fish) |
| CHUM SALMON Dog | | |
| CHINOOK SALMON King | | |
| PINK SALMON Humpy | | |
| SOCKEYE SALMON Red | | |
| COHO SALMON Silver | | |

| NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY LOCATION) | | |
|---|------------------|-------------|
| MARINE WATERS | UNALAKLEET RIVER | NORTH RIVER |
| | | |
| | | |
| | | |
| | | |
| | | |

4. Comments or Suggestions?

| |
|--|
| |
| |
| |
| |
| |

| | |
|--|---------------------|
| NORTON SOUND 2013 SUBSISTENCE SALMON HARVEST SURVEY | Community ID# 307 |
| Alaska Department of Fish and Game- | Household ID# _____ |

| | |
|--------------------------------|----------------------------------|
| Community: SHAKTOOLIK _____ | Household Size: _____ |
| Survey Date: _____ | (If new household) PO Box: _____ |
| Interviewer: _____ | |

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) | |
|------------------------|--|---|
| | SUBSISTENCE GILL NET or SEINE <small>(Number of fish)</small> | ROD & REEL <small>(Number of fish)</small> |
| | CHUM SALMON Dog | |
| CHINOOK SALMON King | | |
| PINK SALMON Humpy | | |
| SOCKEYE SALMON Red | | |
| COHO SALMON Silver | | |

| NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY LOCATION) | |
|---|---------------------|
| MARINE WATERS | SHAKTOOLIK RIVER |
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4. Comments or Suggestions?

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| NORTON SOUND 2013 SUBSISTENCE SALMON HARVEST SURVEY | | Community ID# 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|------------------|---|--------------------------------------|-------------|--|--|-----------------|--|--|---------------|--|--|----------------|--|--|----------------|--|--|---|---|--|--|--|------------------|----------------|---------------------|------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Alaska Department of Fish and Game- | | Household ID# _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Community: KOYUK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Survey Date: _____ | Household Size: _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Interviewer: _____ | (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) <input type="checkbox"/> YES <input type="checkbox"/> NO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Does your household <u>usually</u> subsistence fish for salmon? <input type="checkbox"/> YES <input type="checkbox"/> 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. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="padding: 5px;">SPECIES</th> <th colspan="2" style="padding: 5px;">NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY GEAR TYPE)</th> </tr> <tr> <th style="padding: 5px;">SUBSISTENCE GILL NET or SEINE (Number of fish)</th> <th style="padding: 5px;">ROD & REEL (Number of fish)</th> </tr> </thead> <tbody> <tr><td style="padding: 5px;">CHUM Dog</td><td></td><td></td></tr> <tr><td style="padding: 5px;">CHINOOK King</td><td></td><td></td></tr> <tr><td style="padding: 5px;">PINK Humpy</td><td></td><td></td></tr> <tr><td style="padding: 5px;">SOCKEYE Red</td><td></td><td></td></tr> <tr><td style="padding: 5px;">COHO Silver</td><td></td><td></td></tr> </tbody> </table> | SPECIES | NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY GEAR TYPE) | | SUBSISTENCE GILL NET or SEINE (Number of fish) | ROD & REEL (Number of fish) | CHUM Dog | | | CHINOOK King | | | PINK Humpy | | | SOCKEYE Red | | | COHO Silver | | | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="padding: 5px;">NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY LOCATION)</th> </tr> <tr> <th style="padding: 5px;">MARINE WATERS</th> <th style="padding: 5px;">KOYUK RIVER</th> <th style="padding: 5px;">INGLUTALIK RIVER</th> <th style="padding: 5px;">UNGALIK RIVER</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </tbody> </table> | NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY LOCATION) | | | | MARINE WATERS | KOYUK RIVER | INGLUTALIK RIVER | UNGALIK RIVER | | | | | | | | | | | | | | | | | | | | |
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| PINK Humpy | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOCKEYE Red | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COHO Silver | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| MARINE WATERS | KOYUK RIVER | INGLUTALIK RIVER | UNGALIK RIVER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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RED KING CRAB

Emergency Order: 3-C-Z-01-13 Effective Date: July 3, 2013

EXPLANATION: This emergency order opens both the CDQ fishery and the commercial open access crab fishery in Norton Sound from 12:00 noon Wednesday, July 3 until 12:00 noon Monday, September 2, or when the CDQ and the open access quota is reached.

JUSTIFICATION: By regulation the open access king crab fishery can open anytime on or after June 15 by Emergency Order. Currently two land-based processor-buyers are registered and both buyers are ready to purchase open access crab. The guideline harvest level for the 2013 Norton Sound open access fishery is 458,430 pounds. By regulation the CDQ crab fishery can open anytime the CDQ group is ready to harvest the crab. The CDQ crab can only be harvested by permit holders approved by Norton Sound Economic Development Corporation and the quota is 37,170 pounds. The CDQ group has notified the department they are ready to harvest crab.

Emergency Order: 3-C-Z-02-13 Effective Date: August 1, 2013

EXPLANATION: This emergency order moves the closed boundary line between 166°15'W (Sledge Island) and 163°30'W (near Square Rock) north by 3 miles, to 64°18'N from the current 64°15'N.

JUSTIFICATION: As of July 30, approximately 145,000 pounds have been harvested out of the total GHIL of 495,600 pounds. Based on the current catch rate, the GHIL is projected to be reached in mid- to late-September. The department is reducing the area closed to commercial crab fishermen by an incremental amount in order to give fishermen access to additional fishing grounds so they can more efficiently harvest the allowable quota of red king crab. Analysis of results from the spring tagging project and known distribution patterns from trawl surveys suggests this expanded area will allow additional access to legal king crab while minimizing handling of non-target king crab such as females and juvenile crab. Due to the particularly large biomass of crab available for all fisheries, this small increase in area available to commercial harvest is not expected to adversely impact the subsistence king crab fisheries or the future health of the king crab population.

Emergency Order: 3-C-Z-03-13 Effective Date: August 7, 2013

EXPLANATION: This emergency order moves the closed boundary line between 162°38'W (Carson Creek) and 162°W (the eastern border of statistical area 626401) north by 5 miles to 64°15'N from the current 64°10'N. Additionally, the closure line between 162°W and 161°30'W (Cape Denbigh) will be moved north, by 3 miles to 64°18'N from the current 64°15'N.

JUSTIFICATION: As of August 6, approximately 191,000 pounds have been harvested out of the total GHIL of 495,600 pounds. Based on the current catch rate, the GHIL is projected to be reached in mid- to late-September. The department is reducing the area on the east side of Norton Sound closed to commercial crab fishermen by an incremental amount in order to give east side fishermen access to additional fishing grounds so they can more efficiently harvest the allowable quota of red king crab. Results from the spring tagging project indicate this newly opened area is likely to have an appreciable amount of large male red king crab.

Emergency Order: 3-C-Z-04-13 Effective Date: September 3, 2013

EXPLANATION: This emergency order extends both the CDQ fishery and the commercial open access crab fishery in Norton Sound from 12:00 noon Tuesday, September 3 until 12:00 noon Tuesday, September 10, unless there are conservation concerns or there is no longer any buyer interest. In addition, the closed boundary line between 166°15'W (Sledge Island) and 163°30'W (near Square Rock) that was moved north by 3 miles, to 64°18'N from 64°15'N on August 1, will remain at 64°18'N. The closed boundary line between 162°38'W (Carson Creek) and 162°W (the eastern border of statistical area 626401) that was moved north by 5 miles to 64°15'N from 64°10'N, and the closure line between 162°W and 161°30'W (Cape Denbigh) that was moved north by 3 miles to 64°18'N

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from 64°15'N on August 7, will both remain at the new location until September 10.

JUSTIFICATION: Currently four processor-buyers are registered and most buyers continue to be interested in purchasing open access crab. The guideline harvest level for the 2013 Norton Sound open access fishery is 458,430 pounds and for the CDQ fishery, the quota is 37,170 pounds. Through the morning of September 3, total reported open access harvest is ~289,800 pounds, and total CDQ harvest is 13,480 pounds. Roughly 168,600 pounds remain of the open access quota and 23,690 pounds remain of the CDQ quota. Based on the current catch rate, the GHL is not expected to be reached this year. However, the season is being extended to provide fishermen with additional harvest opportunity on the remaining quotas unless there are indications that crab are molting. In 2009, during a similar temperature regime to this current year, molting crab began appearing in the harvest during mid-September. Therefore, the fishery may be able to extend for an additional week without harvesting appreciable quantities of molting crab.

Emergency Order: 3-C-Z-05-13 **Effective Date:** September 10, 2013

EXPLANATION: This emergency order extends both the CDQ fishery and the commercial open access crab fishery in Norton Sound from 12:00 noon Tuesday, September 10 until 6:00 PM Friday, September 13, unless there are conservation concerns or there is no longer any buyer interest. In addition, the closed boundary line between 166°15'W (Sledge Island) and 163°30'W (near Square Rock) that was moved north by 3 miles, to 64°18'N from 64°15'N on August 1, will remain at 64°18'N. The closed boundary line between 162°38'W (Carson Creek) and 162°W (the eastern border of statistical area 626401) that was moved north by 5 miles to 64°15'N from 64°10'N, and the closure line between 162°W and 161°30'W (Cape Denbigh) that was moved north by 3 miles to 64°18'N from 64°15'N on August 7, will both remain at the new location until September 13.

JUSTIFICATION: Currently four processor-buyers are registered and all buyers continue to be interested in purchasing crab. The guideline harvest level for the 2013 Norton Sound open access fishery is 458,430 pounds and for the CDQ fishery, the quota is 37,170 pounds. Through the morning of September 10, total reported open access harvest is ~336,100 pounds, and total CDQ harvest is 16,252 pounds. Roughly 122,300 pounds remain of the open access quota and 20,918 pounds remain of the CDQ quota. The GHL will not be reached this year. However, the season is being extended again to provide fishermen with additional harvest opportunity on the remaining quotas. A handful of newly molted crab has shown up in the commercial fishery, but meat fill samples from the major buyer have remained consistent in the 60-70% range by weight since early August. Therefore, the fishery may be able to extend for an additional 3 days without harvesting appreciable quantities of molting crab.

Emergency Order: 3-C-Z-06-13 **Effective Date:** September 13, 2013

EXPLANATION: This emergency order extends by one day the Norton Sound CDQ and commercial open access king crab fishery, which will close at 6:00PM on Saturday, September 14. Permit holders must have all pots unbaited and secured open by 6:00PM, Saturday, September 14 and all pots must be removed from the water by Saturday, September 21, 2013.

JUSTIFICATION: The guideline harvest level for the 2013 Norton Sound king crab fishery of 495,600 pounds will not be reached. However, because of sudden adverse marine conditions, the commercial open access and CDQ king crab fishery in Norton Sound originally scheduled to close at 6:00 PM Friday, September 13 will now have fishing time extended to 6:00 PM Saturday, September 14. All pot gear must have doors open and bait containers removed by 6:00 PM Saturday, September 14. All crab must be delivered by 6:00 PM Sunday, September 15 and all crab gear used in the commercial fishery must be out of the water by Saturday, September 21. Weather is expected to lay down by Saturday morning.

HERRING

Emergency Order: 3-H-Z-1-13 **Effective Date:** June 7, 2013

EXPLANATION: This emergency order opens the Norton Sound District to commercial gillnet fishing for sac roe herring beginning 6:00 p.m. Friday, June 7, 2013 until Monday, July 1, 2013, unless superseded by another

-continued-

emergency order.

JUSTIFICATION: As of this morning, water temperatures between 5–6 degrees Celsius have been recorded amidst the floating ice and farther away from melt water plumes, water temperatures as high as 7 degrees have been observed. Approximately 50 tons of herring were also observed by NSEDC biologists on June 5 near Cape Denbigh. Taken collectively, all available assessment information suggests that large schools of ripe herring are accumulating offshore in deeper, relatively warm water, but will soon approach the southeastern Norton Sound coastline to spawn in abundance, possibly as early as this weekend. Once major spawning begins, excellent catch rates with high roe recovery are expected in the fishery for 2–4 days, which will be followed by a sharp decline in catch rates and percent roe as the larger, older age-class herring vacate the spawning grounds. Any herring not purchased by the buyer must be retained for personal or subsistence uses.

KOTZEBUE SALMON

Emergency Order: 3-S-X-01-13 Effective Date: July 10, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 8 p.m. Wednesday, July 10 until 4 a.m. Thursday, July 11.

JUSTIFICATION: One major commercial salmon buyer has registered to purchase Kotzebue chum salmon this season. The buyer has limited quantities of ice and airline schedules will affect the buyer's ability to ship fish out. Regulation allows the season to be open from July 10 through August 31. The buyer has notified the department that they would like to begin purchasing fish on the evening of July 10. This 8 hour opening will serve as test of earlier run strength.

Emergency Order: 3-S-X-02-13 Effective Date: July 11, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 8 p.m. Thursday, July 11 until 2 a.m. Friday, July 12.

JUSTIFICATION: The first commercial salmon fishing period of the season was 8 hours last night and 10 permit holders caught 1,360 chum salmon. The catch was average for this date. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-03-13 Effective Date: July 12, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Friday, July 12 until 2 a.m. Saturday, July 13.

JUSTIFICATION: The second commercial salmon fishing period of the season was 6 hours last night and 12 permit holders caught 1,535 chum salmon. The catch was average for this date. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-04-13 Effective Date: July 13, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District from the hours of 8 a.m. to 1 p.m. daily beginning on Saturday, July 13 until 1 p.m. Saturday, July 20.

JUSTIFICATION: There is a small market buyer interested in buying salmon from one permit holder. Compared to the normal fishing effort of over 30 permit holders during some periods during this time last year the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-05-13 Effective Date: July 14, 2013

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EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Sunday, July 14 until 2 a.m. Monday, July 15.

JUSTIFICATION: The third commercial salmon fishing period of the season was 8 hours Friday night and 9 permit holders caught 2,368 chum salmon. The catch was average for this date. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-06-13 **Effective Date:** July 15, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Monday, July 15 until 2 a.m. Tuesday, July 16.

JUSTIFICATION: The fourth commercial salmon fishing period of the season was 8 hours Sunday night and 10 permit holders caught 2,077 chum salmon. The catch was average for this date. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-07-13 **Effective Date:** July 16, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Tuesday, July 16 until 2 a.m. Wednesday, July 17.

JUSTIFICATION: The fifth commercial salmon fishing period of the season was 8 hours Monday night and 17 permit holders caught 2,038 chum salmon. The catch was average for this date. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-08-13 **Effective Date:** July 17, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Wednesday, July 17 until 2 a.m. Thursday, July 18.

JUSTIFICATION: The sixth commercial salmon fishing period of the season was 8 hours Tuesday night and 18 permit holders caught 5,994 chum salmon. The catch was more than double the previous 8-hour opening, but was average for this date. Usually commercial catch jumps up the in mid-July and will continue to build until early August during normal run timing years. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-09-13 **Effective Date:** July 18, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Thursday, July 18 until 2 a.m. Friday, July 19.

JUSTIFICATION: The seventh commercial salmon fishing period of the season was 8 hours Wednesday night and 23 permit holders caught 4,908 chum salmon. The catch was average for this date. The cumulative catch is now over 20,000 chum salmon. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-10-13 **Effective Date:** July 19, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 8 p.m. Friday, July 19 until 12 a.m. Saturday, July 20.

JUSTIFICATION: The eighth commercial salmon fishing period of the season was 8 hours Thursday night and 29 permit holders caught 10,476 chum salmon. Usually during the second week of July the catch often does jump to 10,000 plus fish. The cumulative catch is now over 30,000 chum salmon. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

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Emergency Order: 3-S-X-11-13 Effective Date: July 21, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District from the hours of 7 a.m. to 1 p.m. daily beginning on Sunday, July 21 until 1 p.m. Saturday, July 27.

JUSTIFICATION: There is a small market buyer interested in buying salmon from one permit holder. Compared to the normal fishing effort of over 30 permit holders during some periods during this time last year the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-12-13 Effective Date: July 21, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 8 p.m. Sunday, July 21 until 2 a.m. Monday, July 22.

JUSTIFICATION: The ninth commercial salmon fishing period of the season was 4 hours Friday night and 26 permit holders caught 6,013 chum salmon. Increasing run strength necessitated the buyer to reduce fishing time from 8 hours to 4 hours. Because the run is building normally the buyer has capacity concerns and will likely continue with openings less than 8 hours. The Kobuk River test fishing project has been operational since Wednesday with catches better than last year over the same time period. Last year's season catch index ranked third out of 20 years. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-13-13 Effective Date: July 22, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 8 p.m. Monday, July 22 until 2 a.m. Tuesday, July 23.

JUSTIFICATION: The tenth commercial salmon fishing period of the season was 6 hours Sunday night and 33 permit holders caught 5,586 chum salmon. The Kobuk River test fishing project has been operational since Wednesday with catches better than last year over the same time period. Last year's season catch index ranked third out of 20 years. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-14-13 Effective Date: July 23, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 6 p.m. Tuesday, July 23 until 12 a.m. Wednesday, July 24.

JUSTIFICATION: The eleventh commercial salmon fishing period of the season was 6 hours Monday night and 34 permit holders caught 6,216 chum salmon. Catch and fishing effort were average for this time period. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-15-13 Effective Date: July 24, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 8 p.m. Wednesday, July 24 until 12 a.m. Thursday, July 25.

JUSTIFICATION: The twelfth commercial salmon fishing period of the season was 4 hours Tuesday night and 38 permit holders caught 17,712 chum salmon. The catch was the second highest catch for one fishing period since a buyer returned to the Kotzebue commercial fishery in 2004. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-16-13 Effective Date: July 25, 2013

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EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 6 p.m. Thursday, July 25 until 12 a.m. Friday, July 26.

JUSTIFICATION: Catch during last night's 4-hour opening was 2,683 chum salmon by 9 permit holders. Windy conditions likely resulted in a reduced fishing effort last night. The commercial harvest this season is expected to be within the range of 225,000 to 250,000 chum salmon if market conditions can accept that level of harvest. The total commercial harvest to date is nearly 70,000 chum salmon. Last year by this date the harvest was 60,000 chum salmon and total harvest for the season was nearly 228,000 chum salmon. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-17-13 Effective Date: July 28, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District from the hours of 7 a.m. to 1 p.m. daily beginning on Sunday, July 28 until 1 p.m. Saturday, August 10.

JUSTIFICATION: There is a small market buyer interested in buying salmon from one permit holder. The major buyer is restricting fishing time with the peak weeks of salmon passage now and plans to request fishing openings for limited hours in the evening. Compared to the normal fishing effort of over 30 permit holders during some periods this season the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-18-13 Effective Date: July 26, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 6 p.m. until 10 p.m. Friday, July 26.

JUSTIFICATION: Catch during last night's 6-hour opening was 11,894 chum salmon by 41 permit holders. The commercial harvest this season is expected to be within the range of 225,000 to 250,000 chum salmon if market conditions can accept that level of harvest. The commercial harvest to date is over 80,000 chum salmon. Last year by this date the harvest was 63,000 chum salmon and total harvest for the season was nearly 228,000 chum salmon. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-19-13 Effective Date: July 28, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 6 p.m. Sunday, July 28 until 12 a.m. Monday, July 29.

JUSTIFICATION: Catch during Friday night's 4-hour opening was 9,083 chum salmon by 40 permit holders. Chum salmon catch index at the department test fish project on Kobuk River near Kiana ranks sixth highest in 21-year project history indicating a good chum salmon run to the Kobuk River system. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-20-13 Effective Date: July 30, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 5 hours from the hours of 6 p.m. until 11 p.m. Tuesday, July 30.

JUSTIFICATION: Catch during Sunday night's 6-hour opening was 17,283 chum salmon by 41 permit holders. Chum salmon catch index at the department test fish project on Kobuk River near Kiana ranks sixth highest in 21-year project history indicating a good chum salmon run to the Kobuk River system. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-21-13 Effective Date: July 31, 2013

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EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours daily from the hours of 6 p.m. to 12 a.m. beginning on Wednesday, July 31 until 12 a.m. Tuesday, August 6.

JUSTIFICATION: Cumulative test fish catch ranks sixth highest out of 21 years at the Kobuk River test fish project. The cumulative test fish index is expected to reach 600 today and that is the minimum amount needed to ensure escapement and allow continued commercial fishing. Continued short duration openings the coming week should not jeopardize subsistence opportunity.

Emergency Order: 3-S-X-22-13 **Effective Date:** August 1, 2013

EXPLANATION: This emergency order amends emergency order 3-S-X-21-13 by reducing commercial fishing time from 6 hours to 4 hours for period on Thursday, August 1 in the Kotzebue District. Effective 6:00 p.m. Thursday, August 1, this emergency order reopens the Kotzebue District for 4 hours from 6:00 p.m. to 10:00 p.m. Effective Friday, August 2, this emergency order permits commercial salmon fishing to resume on a fishing schedule of 6 hours a day from 6:00 p.m. to 12:00 midnight, until 12:00 a.m. Tuesday, August 6.

JUSTIFICATION: Cumulative test fish catch ranks sixth highest out of 21 years at the Kobuk River test fish project. The cumulative test fish index is expected to reach 600 today and that is the minimum amount needed to ensure escapement and allow continued commercial fishing. Continued short duration openings the coming week should not jeopardize subsistence opportunity.

Emergency Order: 3-S-X-23-13 **Effective Date:** August 4, 2013

EXPLANATION: This emergency order amends emergency order 3-S-X-22-13 by reducing commercial fishing time from 6 hours to 4 hours for period on Sunday, August 4 in the Kotzebue District. Effective 6:00 p.m. Sunday, August 4, this emergency order reopens the Kotzebue District for 4 hours from 6:00 p.m. to 10:00 p.m. Effective Monday, August 5, this emergency order permits commercial salmon fishing to resume on a fishing schedule of 6 hours a day from 6:00 p.m. to 12:00 midnight, until 12:00 a.m. Tuesday, August 6.

JUSTIFICATION: Cumulative test fish catch ranks fourth highest out of 21 years at the Kobuk River test fish project. The cumulative test fish index is at 997 index points which is well above the minimum amount (600 points) needed to ensure escapement and allow continued commercial fishing. Continued short duration openings the coming week should not jeopardize subsistence opportunity.

Emergency Order: 3-S-X-24-13 **Effective Date:** August 5, 2013

EXPLANATION: This emergency order supersedes emergency order 3-S-X-23-13 by reducing commercial fishing time from 6 hours to 4 hours for period on Sunday, August 4 in the Kotzebue District. Effective 6:00 p.m. Sunday, August 4, this emergency order reopens the Kotzebue District for 4 hours from 6:00 p.m. to 10:00 p.m.

JUSTIFICATION: Cumulative test fish catch ranks fourth highest out of 21 years at the Kobuk River test fish project. The cumulative test fish catch has reached 1,100 index points yesterday and that is well above the minimum index of 600 fish needed to ensure escapement and allow continued commercial fishing. Continued short duration openings the coming week should not jeopardize subsistence opportunity.

Emergency Order: 3-S-X-25-13 **Effective Date:** August 6, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 6 p.m. until 10 p.m. Tuesday, August 6.

JUSTIFICATION: Catch during last night's 4-hour opening was 9,672 chum salmon by 40 permit holders. The commercial harvest this season is tracking ahead the department forecast range of 225,000 to 250,000 chum salmon. The commercial harvest to date is over 165,000 chum salmon. Last year by this date the harvest was 151,000 chum salmon and total harvest for the season was nearly 228,000 chum salmon. Continuing with short duration

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commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-26-13 Effective Date: August 7, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 7 p.m. until 11 p.m. Wednesday, August 7.

JUSTIFICATION: Catch during last night's 4-hour opening was 7,300 chum salmon by 34 permit holders. The commercial harvest this season is tracking ahead the department forecast range of 225,000 to 250,000 chum salmon. The commercial harvest to date is over 172,000 chum salmon. Last year by this date the harvest was 158,000 chum salmon and total harvest for the season was nearly 228,000 chum salmon. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-27-13 Effective Date: August 8, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 5 p.m. until 9 p.m. Thursday, August 8.

JUSTIFICATION: Catch during last night's 4-hour opening was 12,427 chum salmon by 41 permit holders. The commercial harvest this season is tracking ahead the department forecast range of 225,000 to 250,000 chum salmon. The commercial harvest to date is over 185,000 chum salmon. Last year by this date the harvest was 175,000 chum salmon and total harvest for the season was nearly 228,000 chum salmon. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-28-13 Effective Date: August 11, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District from the hours of 7 a.m. to 1 p.m. daily beginning on Sunday, August 11 until 1 p.m. Saturday, August 17.

JUSTIFICATION: There is a small market buyer interested in buying salmon from a few permit holders. The major buyer is restricting fishing time with the peak weeks of salmon passage now and plans to request fishing openings for limited hours in the evening. Compared to the normal fishing effort of over 40 permit holders during some periods this season the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-29-13 Effective Date: August 11, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 5 p.m. until 9 p.m. Sunday, August 11.

JUSTIFICATION: Catch during Thursday night's 4-hour opening was 10,875 chum salmon by 43 permit holders. The commercial harvest to date is over 195,000 chum salmon. Last year by this date the harvest was 188,000 chum salmon and total harvest for the season was nearly 228,000 chum salmon. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-30-13 Effective Date: August 12, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 5 p.m. until 9 p.m. Monday, August 12.

JUSTIFICATION: Catch during Sunday night's 4-hour opening was 11,830 chum salmon by 35 permit holders. The catch was average for this date. The commercial harvest to date is over 208,000 chum salmon. The department forecast was for a commercial harvest of 225,000 to 250,000 chum salmon in 2013. Last year by this date the harvest was 188,000 chum salmon and total harvest for the season was nearly 228,000 chum salmon. Catch at the Kobuk River test fish project continues to be well above average and ranks second best in the 21-year project

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history. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-31-13 Effective Date: August 13, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 5 p.m. until 9 p.m. Tuesday, August 13.

JUSTIFICATION: Catch during Monday night's 4-hour opening was 11,067 chum salmon by 40 permit holders. The catch was average for this date. The commercial harvest to date is over 219,000 chum salmon. The department forecast was for a commercial harvest of 225,000 to 250,000 chum salmon in 2013. Last year by this date the harvest was 195,000 chum salmon and total harvest for the season was nearly 228,000 chum salmon. Catch at the Kobuk River test fish project continues to be well above average and ranks second best in the 21-year project history. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-32-13 Effective Date: August 14, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 5 p.m. until 9 p.m. Wednesday, August 14.

JUSTIFICATION: Catch during Tuesday night's 4-hour opening was 10,917 chum salmon by 40 permit holders. The catch was average for this date. The commercial harvest to date is over 230,000 chum salmon. The department forecast was for a commercial harvest of 225,000 to 250,000 chum salmon in 2013 and this year's catch has exceeded last year's catch of nearly 228,000 chum salmon. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-33-13 Effective Date: August 15, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 5 p.m. until 9 p.m. Thursday, August 15.

JUSTIFICATION: Catch during last night's 4-hour opening was 12,057 chum salmon by 44 permit holders. The catch was above average for this date. The commercial harvest to date is over 242,000 chum salmon. The department forecast was for a commercial harvest of 225,000 to 250,000 chum salmon in 2013 and the forecast will easily be exceeded this year. Kobuk River test catch index ranks second best and projections indicate the catch index will likely be a record at project conclusion. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-34-13 Effective Date: August 16, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 3 hours from the hours of 6 p.m. until 9 p.m. Friday, August 16.

JUSTIFICATION: Catch during last night's 4-hour opening was 15,805 chum salmon by 44 permit holders. The catch was above average for this date. During the past week the catch was the best this season with over 60,000 chum salmon harvested. The commercial harvest to date is over 258,000 chum salmon. The department forecast of a 225,000 to 250,000 chum salmon harvest in 2013 has been exceeded. Kobuk River test catch index ranks second best and projections indicate the catch index will likely be a record at project conclusion. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-35-32 Effective Date: August 18, 2013

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EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District from the hours of 7 a.m. to 1 p.m. daily beginning on Sunday, August 18 until 1 p.m. Saturday, August 24.

JUSTIFICATION: There is a small market buyer interested in buying salmon from a few permit holders. The major buyer is restricting fishing time with the peak week of salmon catch this week and plans to request fishing openings for limited hours in the evening. Compared to the normal fishing effort of over 40 permit holders during some periods this season the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-36-13 **Effective Date:** August 18, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 3 hours from the hours of 6 p.m. until 9 p.m. Sunday, August 18.

JUSTIFICATION: Catch during Friday night's 3-hour opening was 8,385 chum salmon by 38 permit holders. The catch was above average for the time fished. During the past week the catch was the best this season with over 70,000 chum salmon harvested. The commercial harvest to date is over 266,000 chum salmon. The department forecast of a 225,000 to 250,000 chum salmon harvest in 2013 has been exceeded. Kobuk River test catch index ranks second best and projections indicate the catch index will likely be a record at project conclusion. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-37-13 **Effective Date:** August 19, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 2 hours from the hours of 7 p.m. until 9 p.m. Monday, August 19.

JUSTIFICATION: Catch during Sunday night's 3-hour opening was 9706 chum salmon by 36 permit holders. The catch was above average for this time of the year. The commercial harvest to date is over 276,000 chum salmon and is a record for the 2000s. Kobuk River test catch index ranks second best and projections indicate the catch index be a record by the conclusion test fishing today or tomorrow. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-38-13 **Effective Date:** August 20, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 3 hours from the hours of 6 p.m. until 9 p.m. Tuesday, August 20.

JUSTIFICATION: Catch during Monday night's 2-hour opening was 4,229 chum salmon by 35 permit holders. The catch was above average for the time fished. The commercial harvest to date is over 280,000 chum salmon. The department forecast of a 225,000 to 250,000 chum salmon harvest in 2013 has been exceeded. Kobuk River test catch index had the best catch index this season in the 21-year project history. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-39-13 **Effective Date:** August 21, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 4 hours from the hours of 5 p.m. until 9 p.m. Wednesday, August 21.

JUSTIFICATION: Catch during Tuesday night's 3-hour opening was 3,467 chum salmon. The catch was average for the time fished. The commercial harvest to date is over 286,000 chum salmon and has exceeded the department forecast of a 225,000 to 250,000 chum salmon harvest. Kobuk River test catch index had the best catch index this season in the 21-year project history. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

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Emergency Order: 3-S-X-40-13 Effective Date: August 22, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 5 hours from the hours of 4 p.m. until 9 p.m. Thursday, August 22.

JUSTIFICATION: Catch during Wednesday night's 4-hour opening was nearly 4,000 chum salmon by 23 permit holders. The catch was average for this date. The commercial harvest for the season is nearly 290,000 chum salmon and with the upcoming period will likely push past 291,000 chum salmon harvested making it the best commercial harvest in 25 years. This season's Kobuk River test catch index has been the best in the 21-year project history. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-41-13 Effective Date: August 23, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 5 hours from the hours of 4 p.m. until 9 p.m. Friday, August 23.

JUSTIFICATION: Catch during Thursday night's 5-hour opening was 7,052 chum salmon by 35 permit holders. The catch was well above average for this date. The commercial harvest for the season is over 296,000 chum salmon and with the upcoming period will likely push past 300,000 chum salmon harvested for only the tenth time in the 52-year history of the fishery. This season's Kobuk River test catch index has been the best in the 21-year project history. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-42-13 Effective Date: August 25, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 5 hours from the hours of 4 p.m. until 9 p.m. Sunday, August 25.

JUSTIFICATION: Catch during Thursday night's 5-hour opening was 2,973 chum salmon by 16 permit holders. The catch and CPUE was above average for this date. The commercial harvest for the season is over 299,000 chum salmon and with the upcoming period will likely push past 300,000 chum salmon harvested for only the tenth time in the 52-year history of the fishery. This season's Kobuk River test catch index has been the best in the 21-year project history. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-43-13 Effective Date: August 26, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 3 p.m. until 9 p.m. Monday, August 26.

JUSTIFICATION: Catch during Sunday night's 5-hour opening was 2,874 chum salmon by 13 permit holders. The catch was average for this date. The commercial harvest for the season is over 300,000 chum salmon and is the best since 1988. The Kobuk River test fishing crew has finished for the season and the chum salmon catch index was the highest in the 21 year project history. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-44-13 Effective Date: August 27, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours, from the hours of 6 a.m. to 12 p.m. daily, beginning on Tuesday, August 27 until 12 p.m. Saturday, August 31.

JUSTIFICATION: There is a small market buyer interested in buying salmon from a few permit holders. The major buyer is buying during a fishing period later in the day. Compared to the normal fishing effort of over 40 permit

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holders during some periods this season the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-45-13 Effective Date: August 27, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 3 p.m. until 9 p.m. Tuesday, August 27.

JUSTIFICATION: Catch during Monday night's 6-hour opening was 392 chum salmon by 6 permit holders. The catch was well below average for this date, but most permit holders were kept on the beach by weather. The commercial harvest for the season is over 300,000 chum salmon and is the best since 1988. The Kobuk River test fishing crew has finished for the season and the chum salmon catch index was the highest in the 21 year project history. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-46-13 Effective Date: August 28, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 3 p.m. until 9 p.m. Wednesday, August 28.

JUSTIFICATION: Catch during Tuesday two 6-hour opening was 2,903 chum salmon. The catch was average for the fished. The commercial harvest for the season is over 300,000 chum salmon and is the best since 1988. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-47-13 Effective Date: August 29, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 12 p.m. until 6 p.m. Thursday, August 29.

JUSTIFICATION: There are two buyers registered in the Kotzebue District and one had requested a six hour morning fishing period and the department had issued a previous emergency order for a six hour fishing period starting at 6 a.m. The second buyer requested a six hour afternoon fishing period. Because the commercial fishing season is winding down and there are no longer any buyer capacity concerns the department is allowing a combined 12 hour fishing period. The commercial harvest for the season is over 300,000 chum salmon and is the best since 1988. The last scheduled day of commercial salmon fishing is August 31. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-X-48-13 Effective Date: August 30, 2013

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 6 hours from the hours of 12 p.m. until 6 p.m. Friday, August 30.

JUSTIFICATION: There are two buyers registered in the Kotzebue District and one had requested a six hour morning fishing period and the department had issued a previous emergency order for a six hour fishing period starting at 6 a.m. The second buyer requested a six hour afternoon fishing period. Because the commercial fishing season is winding down and there are no longer any buyer capacity concerns the department is allowing a combined 12 hour fishing period. The commercial harvest for the season is over 300,000 chum salmon and is the best since 1988. The last scheduled day of commercial salmon fishing is August 31. Continuing with short duration commercial openings should not jeopardize subsistence opportunity or escapement.

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NORTON SOUND SALMON

Emergency Order: 3-S-Z-01-13 Effective Date: June 15, 2013

EXPLANATION: This emergency order sets the subsistence salmon gillnet fishing schedule for the Nome Subdistrict and catch limits for the Nome Subdistrict (Subdistrict 1), and Pilgrim and Kuzitrin Rivers in the Port Clarence District. The subsistence salmon gillnet schedule will be from 6 p.m. Wednesday until 6 p.m. Saturday in the Nome Subdistrict marine waters west of Cape Nome and the catch limits for all locations are listed on the permits. Beach seines are allowed to be used during the salmon gillnet schedule.

JUSTIFICATION: The department forecast for 2013 is that the chum salmon run will exceed the ANS and Tier II restrictions will not be required. Because of the late spring the department is allowing beach seines to be used to increase the efficiency of the harvest and will reassess the use of beach seines when the peak of the run enters Nome Subdistrict rivers in July. Catch limits are still in effect for the various marine and fresh water subsistence areas. All catch limits are listed on the permits. The department staff will be flying frequent aerial surveys and boating some of the rivers to track the salmon migration strength and progress. The weirs and towers on the Nome, Snake, Eldorado, Solomon and Pilgrim Rivers, will also be used to track the various salmon migrations. If a stream appears to have adequate escapement, catch limits will be lifted in that area.

Emergency Order: 3-S-Z-02-13 Effective Date: June 17, 2013

EXPLANATION: This emergency order closes all marine waters in Norton Sound Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts to subsistence salmon fishing effective 8:00 a.m. Monday, June 17 and reopens Subdistricts 5 and 6 to subsistence fishing schedules and gear restrictions in Subdistrict 5 until midnight Sunday evening, July 14.

Effective 8:00 a.m. Monday, June 17, subsistence salmon fishing will reopen in the marine waters of Subdistrict 5 to a subsistence fishing schedule of two 48-hour periods per week, but will be restricted to set gillnets with a mesh size no greater than 6 inches. Subsistence fishing periods in the Shaktoolik Subdistrict will be from 6:00 p.m. Mondays to 6:00 p.m. Wednesdays, and from 6:00 p.m. Thursdays to 6:00 p.m. Saturdays.

Also effective 8:00 a.m. Monday, June 17, the marine waters of Subdistrict 6, the Unalakleet Subdistrict, will reopen to subsistence salmon fishing on a schedule of two 24-hour periods per week. Subsistence fishing periods in the Unalakleet Subdistrict will be from 6:00 p.m. Mondays to 6:00 p.m. Tuesdays and from 6:00 p.m. Fridays to 6:00 p.m. Saturdays.

JUSTIFICATION: Chinook salmon runs to southeastern Norton Sound are expected to be very poor this season. The combined Subdistricts 5 and 6 Chinook salmon run could be as low as 4,500 fish this season, and this level of abundance is not sufficient to justify sport fishery harvests or support historical Chinook salmon harvest rates. These preemptive restrictions are being implemented this season to significantly reduce harvest rates of Chinook salmon and ensure that escapement goals are achieved in the Shaktoolik and Unalakleet River drainages. In addition to restrictions, subsistence users are also strongly encouraged to redirect harvest pressure on other more numerous species this season, such as chum salmon which are anticipated to be abundant in southern Norton Sound. Once the Chinook salmon run begins, inseason management will be based upon escapement counts and subsistence fishing reports. Fishing restrictions may be relaxed or further restrictions may be necessary depending on run assessment.

Emergency Order: 3-S-Z-03-13 Effective Date: June 17, 2013

EXPLANATION: This emergency order closes all fresh waters of the Shaktoolik and Unalakleet River drainages to subsistence salmon fishing effective 8:00 a.m. Monday, June 17, and immediately reopens subsistence fishing in the Shaktoolik and Unalakleet River drainages to subsistence fishing with set gillnets with a mesh size not greater than 4 ½ inches. Additionally, this emergency order establishes a subsistence fishing schedule for the Unalakleet River drainage effective 8:00 a.m. Monday, June 17, of two 36-hour periods per week.

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Effective 8:00 a.m. Monday, June 17, subsistence salmon fishing will reopen in the Shaktoolik River drainage but will be limited to set gillnets with a mesh size no greater than 4 ½ inches.

Also effective 8:00 a.m. Monday, June 17, the Unalakleet River drainage will reopen to subsistence salmon fishing on a schedule of two 36-hour periods per week. Subsistence fishing periods in the Unalakleet River drainage will be from 8:00 a.m. Mondays to 8:00 p.m. Tuesdays and from 8:00 a.m. Fridays to 8:00 p.m. Saturdays.

JUSTIFICATION: Chinook salmon runs to southeastern Norton Sound are expected to be very poor this season. The combined Subdistricts 5 and 6 Chinook salmon run could be as low as 4,500 fish this season, and this level of abundance is not sufficient to justify sport fishery harvests or support historical Chinook salmon harvest rates. These preemptive restrictions are being implemented this season to significantly reduce harvest rates of Chinook salmon and ensure that escapement goals are achieved in the Shaktoolik and Unalakleet River drainages. In addition to restrictions, subsistence users are also strongly encouraged to redirect harvest pressure on other more numerous species this season, such as chum salmon which are anticipated to be abundant in southern Norton Sound. Once the Chinook salmon run begins, inseason management will be based upon escapement counts and subsistence fishing reports. Fishing restrictions may be relaxed or further restrictions may be necessary depending on run assessment.

Emergency Order: 3-S-Z-04-13 **Effective Date:** June 25, 2013

EXPLANATION: This emergency order opens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay Subdistrict, to two 48-hour periods from 6:00 p.m. Tuesday, June 25 to 6:00 p.m. Thursday, June 27 and from 6:00 p.m. Friday, June 28 to 6:00 p.m. Sunday, June 30. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: An average to above average run of chum salmon is anticipated this season in Norton Sound Subdistrict 4, the Norton Bay Subdistrict. Escapement and subsistence harvest needs are expected to easily be met and additional surplus should be available for commercial harvest. Norton Sound Seafood Products has expressed interest in purchasing salmon in the Norton Bay Subdistrict. The department will allow two 48-hour commercial openings to gauge early chum salmon run strength and provide commercial harvest opportunity.

Emergency Order: 3-S-Z-05-13 **Effective Date:** July 1, 2013

EXPLANATION: Effective 12:00 a.m. Monday, July 1, the marine waters of Subdistricts 5 and 6, and all freshwaters of the Shaktoolik and Unalakleet River drainages will open to subsistence salmon fishing with beach seines 24 hours a day, seven days a week until Saturday, August 10. This emergency order also prohibits the retention of any king salmon incidentally captured in beach seines while targeting other salmon for subsistence uses. All king salmon incidentally captured in beach seines must be immediately released back into the water unharmed.

JUSTIFICATION: Effective July 1, subsistence salmon fishing in all fresh and marine waters of the Shaktoolik and Unalakleet Subdistricts will open to the use of beach seines 24 hours a day, seven days a week to target salmon other than Chinook salmon. The Alaska Board of Fisheries passed two new regulations in 2013: one requires that beach seines in the Shaktoolik and Unalakleet Subdistricts have a mesh size of 4 ½ inches or less; the other prohibits the retention of any Chinook salmon captured in beach seine gear. Chinook salmon incidentally captured in beach seines must be immediately released unharmed back into the water. Using beach seine gear provides additional opportunity for subsistence users to target abundant pink and chum salmon while ensuring that king salmon can reach spawning areas of the Shaktoolik and Unalakleet River drainages unharmed.

Emergency Order: 3-S-Z-06-13 **Effective Date:** July 2, 2013

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay Subdistrict, to two 48-hour periods from 6:00 p.m. Tuesday, July 2 to 6:00 p.m. Thursday, July 4 and from 6:00 p.m. Friday, July 5 to 6:00 p.m. Sunday, July 7. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

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JUSTIFICATION: The commercial catch of chum salmon during the most recent period in Norton Bay Subdistrict was 4,323 chum salmon by 8 permit holders. Harvest and catch per unit of effort were the most for any period in the history of the Norton Bay commercial salmon fishery. Thus far, 8 permit holders have harvested nearly 5,700 chum salmon in the fishery, which is also record setting for late June. Inglutalik River tower personnel have enumerated over 600 chum salmon as of June 28, which is similar to previous years when 30,000–65,000 chum salmon were counted for the season. Inriver abundance of Norton Bay salmon producing drainages as indexed by the Inglutalik River tower appears more than sufficient to provide for escapements and subsistence use by Koyuk residents.

Emergency Order: 3-S-Z-07-13 **Effective Date:** July 2, 2013

EXPLANATION: This emergency order opens Subdistrict 5 of the Norton Sound Subdistrict, the Shaktoolik Subdistrict, to two 24-hour periods from 6:00 p.m. Tuesday, July 2 to 6:00 p.m. Wednesday, July 3, and from 6:00 p.m. Friday, July 5 to 6:00 p.m. Saturday, July 6. Permit holders in Subdistricts 5 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: This index opening will provide opportunity to gauge early run strength of chum salmon to Subdistrict 5 and utilize projected commercial harvest surpluses of chum salmon. Shaktoolik sonar estimated passage of chum salmon is over 7,600 fish, which indicates that inriver abundance of chum salmon will be sufficient to provide for subsistence uses and escapement needs in the Shaktoolik Subdistrict. Thus, these periods should not jeopardize escapement needs or subsistence uses of chum salmon in Subdistrict 5.

Although chum salmon abundance is sufficient to warrant additional fishing time in Subdistricts 5, periods will be brief for early July to minimize incidental harvest of king salmon. The department will evaluate escapement counts of king salmon this week to determine if additional chum salmon commercial harvest opportunity can be provided. This brief period will also provide an opportunity to evaluate incidental harvest of king salmon in commercial 6-inch mesh set net gear, which will factor in determining the location and extent of future openings directed on chum salmon in Subdistrict 5.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-08-13 **Effective Date:** July 1, 2013

EXPLANATION: This emergency order opens Norton Sound Subdistrict 6, the Unalakleet Subdistrict to commercial salmon fishing for two 24-hour periods from 6:00 p.m. Monday, July 1 to 6:00 p.m. Tuesday, July 2 and from 6:00 p.m. Friday, July 5 to 6:00 p.m. Saturday, July 6. Permit holders in Subdistricts 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: This index opening will provide opportunity to gauge early run strength of chum salmon to Subdistrict 6 and utilize projected commercial harvest surpluses of chum salmon. Chum salmon counts at the Unalakleet River weir are 3,200 chum salmon and the Unalakleet River aerial survey goal of 2,400–4,800 chum salmon is projected to easily be reached. This indicates that inriver abundance of chum salmon will be sufficient to provide for subsistence uses and escapement needs in the Unalakleet Subdistrict. Thus, these periods should not jeopardize escapement needs or subsistence uses of chum salmon in Subdistrict 6.

Although chum salmon abundance is sufficient to warrant additional fishing time in Subdistrict 6, periods will be brief for early July to minimize incidental harvest of king salmon. The department will evaluate escapement counts of king salmon this week to determine if additional chum salmon commercial harvest opportunity can be provided. This brief period will also provide an opportunity to evaluate incidental harvest of king salmon in commercial 6-inch mesh set net gear, which will factor in determining the location and extent of future openings directed on chum salmon in Subdistrict 6.

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Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-09-13 Effective Date: July 8, 2013

EXPLANATION: This emergency order closes all marine waters in Norton Sound Subdistrict 6, the Unalakleet Subdistrict, to subsistence salmon fishing effective 6:00 p.m. Monday, July 8 and immediately reopens Subdistrict 6 to a subsistence fishing schedule with fishermen restricted to set gillnets with a mesh size no larger than 6 inches. The schedule will be from 6:00 p.m. Monday, July 8 to 6:00 p.m. Tuesday, July 9, and from 6:00 p.m. Friday, July 12 to 6:00 p.m. Thursday, July 13. After July 13, the Subdistrict 6 marine subsistence fishery will remain restricted to 6 inches or less until midnight Sunday evening, July 21.

JUSTIFICATION: As expected, the Chinook salmon run to the Unalakleet River drainage is showing very late timing and poor initial run strength. As of July 1, a total of 31 Chinook salmon have been enumerated at the mainstem Unalakleet River weir. North River tower has not been operational since July 1 due to high water levels. However, the Unalakleet River mainstem comprises 45–60% of the drainagewide escapement, which suggests the projected North River Chinook salmon escapement is likely to fall short of the tower-based escapement goal range of 1,200–2,600 fish. Therefore, additional conservation measures are necessary if there is to be any chance of meeting Chinook salmon escapement needs in the Unalakleet River drainage.

Emergency Order: 3-S-Z-10-13 Effective Date: July 6, 2013

EXPLANATION: This emergency order closes all fresh waters of the Unalakleet River drainage to subsistence salmon fishing with set gillnets effective 8:00 p.m. Monday, July 6 until 12:00 a.m. Monday, July 22. Additionally, this emergency order rescinds the subsistence fishing schedule for the Unalakleet River drainage effective 8:00 p.m. Saturday, July 6 until further notice. Subsistence fishermen may continue to use beach seine gear 24 hours a day, 7 days a week to target other salmon, but king salmon must be immediately released unharmed back into the water. Beach seines must have a mesh size of 4 ½ inches or less.

JUSTIFICATION: As expected, the Chinook salmon run to the Unalakleet River drainage is showing very late timing and poor initial run strength. As of July 2, a total of 31 Chinook salmon have been enumerated at the mainstem Unalakleet River weir. North River tower has not been operational since July 1 due to high water levels. However, the Unalakleet River mainstem comprises 45–60% of the drainagewide escapement, which suggests the projected North River Chinook salmon escapement is likely to fall short of the tower-based escapement goal range of 1,200–2,600 fish. Therefore, additional conservation measures are necessary if there is to be any chance of meeting Chinook salmon escapement needs in the Unalakleet River drainage.

Emergency Order: 3-S-Z-11-13 Effective Date: July 9, 2013

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay Subdistrict, for two 48-hour periods from 6:00 p.m. Tuesday, July 9 to 6:00 p.m. Thursday, July 11 and from 6:00 p.m. Friday, July 12 to 6:00 p.m. Sunday, July 14. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: The commercial catch of chum salmon during the most recent period in Norton Bay Subdistrict was 5,700 chum salmon by 8 permit holders. This was the second period in a row with a record high harvest for a single period in the Norton Bay Subdistrict commercial fishery. The total harvest to date of 16,595 chum salmon is now on track to exceed the record harvest of 21,973 chum salmon caught during the 1978 season. Inglutalik River tower personnel have enumerated over 5,600 chum salmon as of July 7, which is more than the July 7 cumulative count of 4,521 in 2012; 32,832 chum salmon were counted during the 2012 season. Current levels of inriver abundance of chum salmon for Norton Bay drainages as indexed by the Inglutalik River tower appear more than sufficient to provide for escapement and subsistence uses by Koyuk residents.

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Emergency Order: 3-S-Z-12-13 Effective Date: July 8, 2013

EXPLANATION: This emergency order reopens Subdistrict 5 of the Norton Sound Subdistrict, the Shaktoolik Subdistrict, for one 48-hour period from 6:00 p.m. Monday, July 8 to 6:00 p.m. Wednesday, July 10, and one 24-hour period from 6:00 p.m. Friday, July 12 to 6:00 p.m. Saturday, July 13. Permit holders in Subdistricts 5 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Chum salmon abundance in the Shaktoolik River drainage is more than sufficient to warrant additional fishing time in Subdistricts 5. Periods have been brief thus far in order to minimize incidental harvest of king salmon. Permit holders were largely stuck on the beach due to hazardous surf conditions arising from southerly winds. The first period is 48 hours in duration in order to mitigate foregone chum salmon harvest opportunities that were lost last week. Historical run timing information suggests that the bulk of the Shaktoolik River king salmon run is in the lower reaches of the Shaktoolik River drainage. Therefore, incidental catches of king salmon for these periods are expected to be very minimal.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-13-13 Effective Date: July 8, 2013

EXPLANATION: This emergency order reopens Norton Sound Subdistrict 6, the Unalakleet Subdistrict to commercial salmon fishing for two 24-hour periods from 6:00 p.m. Monday, July 8 to 6:00 p.m. Tuesday, July 9 and from 6:00 p.m. Friday, July 12 to 6:00 p.m. Saturday, July 13. Permit holders in Subdistricts 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: This index opening will provide opportunity to utilize commercial harvest surpluses of chum salmon. Cumulative chum salmon passage at the Unalakleet River weir now stands at 21,208 chum salmon as of July 7. This is the highest count of chum salmon for July 7 in the project's 4-year history and the Unalakleet River aerial survey goal of 2,400–4,800 chum salmon has been exceeded. Inriver abundance of chum salmon will be sufficient to provide for subsistence uses and escapement needs in the Unalakleet Subdistrict.

Chum salmon abundance is more than sufficient to warrant longer commercial periods directed on chum salmon in Subdistrict 6. However, more aggressive fishing periods will not be scheduled until Monday, July 15 in order to allow the remainder of the king salmon run to enter the Unalakleet River drainage unharmed. Beginning Monday, July 15, 48-hour periods are expected after the bulk of the king salmon run has entered the lower Unalakleet River drainage, with extended (72-hour) periods possible to more efficiently harvest chum salmon surpluses.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-14-13 Effective Date: July 12, 2013

EXPLANATION: This emergency order supersedes emergency orders 3-S-Z-02-13 and 3-S-Z-09-1,3 and closes all marine waters of Norton Sound Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, to subsistence salmon fishing effective 6:00 p.m. Friday, July 12. This emergency order rescinds subsistence fishing schedules of two 48-hour openings per week in the Shaktoolik Subdistrict, and two 24-hour periods per week in the Unalakleet Subdistrict. This emergency order also immediately reopens subsistence salmon fishing in the marine waters of both Subdistricts 5 and 6 for 24 hours a day, 7 days a week, but fishing is restricted to set gillnets with a mesh size of 6 inches or less.

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JUSTIFICATION: Westerly winds and high water levels hastened the entry of king salmon into the lower reaches of the Shaktoolik and Unalakleet River drainages as indicated by a major decline in incidental catches of king salmon in the commercial chum salmon fishery this past week. All available information suggests that the bulk of the king salmon run is now protected within the lower reaches of the Shaktoolik and Unalakleet River drainages. King salmon runs to southern Norton Sound have been very weak and have exhibited later than average run timing. However, closures and restrictions are in place to conserve these king salmon so they may reach known spawning reaches and provide for future returns. Consequently, the department is increasing fishing time in the marine waters to provide additional subsistence opportunity for users to target chum salmon which are in abundance this season.

Emergency Order: 3-S-Z-15-13 **Effective Date:** July 11, 2013

EXPLANATION: This emergency order supersedes emergency order 3-S-Z-13-13 and extends the July 12 24-hour opening in Norton Sound Subdistrict 6, the Unalakleet Subdistrict, by an additional 24 hours, effectively creating a 48-hour period. This emergency order permits commercial salmon fishing for 48 hours from 6:00 p.m. Thursday, July 11 to 6:00 p.m. Saturday, July 13. Permit holders in Subdistricts 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Chum salmon abundance is more than sufficient to warrant longer commercial periods directed on chum salmon in Subdistrict 6. Additional opportunity to target chum salmon for commercial purposes is being provided because recent incidental harvests of king salmon have been very low. Inclement weather from westerly winds kept many fishermen on the beach but also appears to have had the dual effect of pushing the remainder of the king salmon run into the lower reach of the Unalakleet River unharmed.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-16-13 **Effective Date:** July 12, 2013

EXPLANATION: This emergency order supersedes emergency order 3-S-Z-12-13 and extends fishing time in the Norton Sound Subdistrict 5, the Shaktoolik Subdistrict, by 24 hours, thereby creating one 48-hour commercial salmon fishing period from 6:00 p.m. Friday, July 12 to 6:00 p.m. Sunday, July 14. Permit holders in Subdistricts 5 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Chum salmon abundance in the Shaktoolik River drainage is more than sufficient to warrant additional fishing time in Subdistricts 5. Apportioned sonar count estimated passage for the Shaktoolik River is 35,510 chum salmon which is tracking similar to the 39,000 chum salmon observed at the Unalakleet River weir. Additional opportunity to target chum salmon for commercial purposes is being provided because recent incidental harvests of king salmon have been very low. Inclement weather from westerly winds kept many fishermen on the beach in the Shaktoolik Subdistrict, but also appears to have had the dual effect of pushing the remainder of the king salmon run into the lower reach of the Shaktoolik River unharmed. Estimated apportioned Shaktoolik sonar passage as of July 10 is between 1,100–2,200 king salmon.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-17-13 **Effective Date:** July 12, 2013

EXPLANATION: This emergency order supersedes emergency order 3-S-Z-11-13 and extends fishing time in Norton Sound Subdistrict 4, the Norton Bay Subdistrict, by an additional 24 hours. This emergency order therefore,

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reopens commercial salmon fishing in Subdistrict 4 for 72 hours from 6:00 p.m. Friday, July 12 to 6:00 p.m. Monday, July 15. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: The commercial catch of chum salmon during the most recent period in Norton Bay Subdistrict was 3,600 chum salmon by 8 permit holders. Harvests of chum salmon per period continue to be well above average for mid-July. Total harvest of chum salmon in Norton Bay Subdistrict is expected to easily surpass the record harvest of 21,973 chum salmon set in 1978 during this period. Thus far, a total of 20,254 chum salmon have been harvested in the commercial fishery. Inglutalik River tower personnel have enumerated a minimum count of over 6,500 chum salmon as of July 11. High water levels and poor water clarity have made counting operations difficult since July 7 and chum salmon passage is most likely underestimated. Regardless, current levels of inriver abundance of chum salmon for Norton Bay drainages as indexed by the Inglutalik River tower appear more than sufficient to provide for escapement needs and subsistence uses by Koyuk residents.

Emergency Order: 3-S-Z-18-13 **Effective Date:** July 15, 2013

EXPLANATION: This emergency order reopens Subdistrict 5 of the Norton Sound Subdistrict, the Shaktoolik Subdistrict, for one 72-hour period from 6:00 p.m. Monday, July 15 to 6:00 p.m. Thursday, July 18. Permit holders in Subdistricts 5 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Chum salmon abundance in the Shaktoolik River drainage is more than sufficient to warrant additional fishing time in Subdistricts 5. Apportioned sonar count estimated passage for the Shaktoolik River is 35,510 chum salmon which is tracking similar to the 39,000 chum salmon observed at the Unalakleet River weir. Additional opportunity to target chum salmon for commercial purposes is being provided because recent incidental harvests of king salmon have been very low. Inclement weather from westerly winds kept many fishermen on the beach in the Shaktoolik Subdistrict, but also appears to have had the dual effect of pushing the remainder of the king salmon run into the lower reach of the Shaktoolik River unharmed. Estimated apportioned Shaktoolik sonar passage as of July 10 is between 1,100–2,200 king salmon. This 72-hour period will provide additional opportunity to efficiently harvest commercial chum salmon harvestable surpluses during the second peak of the southern Norton Sound chum salmon run.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-19-13 **Effective Date:** July 15, 2013

EXPLANATION: This emergency order reopens Norton Sound Subdistrict 6, the Unalakleet Subdistrict, for one 72-hour period from 6:00 p.m. Monday, July 15 to 6:00 p.m. Thursday, July 18. Permit holders in Subdistricts 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Cumulative chum salmon passage at the Unalakleet River weir now stands at over 39,000 chum salmon as of July 11, which is the highest count of chum salmon for July 11 in the project's 4-year history. Escapement needs of chum salmon have been achieved and inriver abundance of chum salmon is more than sufficient to provide for subsistence uses of Unalakleet Subdistrict residents.

Given the record abundance of chum salmon, longer commercial periods directed on chum salmon are warranted in Subdistrict 6. This additional opportunity to target chum salmon for commercial purposes is being provided because recent incidental harvests of king salmon have been very low. Inclement weather from westerly winds kept many fishermen on the beach but also appears to have had the dual effect of pushing the remainder of the king salmon run into the lower reach of the Unalakleet River unharmed. Weir counts of king salmon have picked up in recent days

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with a total of 313 king salmon enumerated as of July 11.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-20-13 Effective Date: July 16, 2013

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay Subdistrict, for one 72-hour period from 6:00 p.m. Tuesday, July 16 to 6:00 p.m. Friday, July 19. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Norton Bay fishermen have already harvested nearly 24,000 chum salmon this season, which is above the previous record harvest of 21,973 taken back in 1978. Escapement of chum salmon into Norton Bay salmon-producing drainages has also been strong as indexed by the NSEDC-operated Inglutalik River tower. Cumulative passage of chum salmon at Inglutalik River tower is over 30,000 fish, which is tracking similar to the 2011 season when over 64,000 chum salmon were counted. Current levels of inriver chum salmon abundance are more than sufficient to meet subsistence needs and provide escapements to ensure future returns of chum salmon. The increase in commercial fishing time is warranted because large harvestable surpluses of chum salmon remain in Norton Bay and there continues to be buyer interest.

Emergency Order: 3-S-Z-21-13 Effective Date: July 15, 2013

EXPLANATION: This emergency order adds 48-hours to the subsistence salmon gillnet fishing schedule for Subdistrict 1 west of Cape Nome. The subsistence salmon gillnet schedule will change from 6 p.m. Wednesday to 6 p.m. Saturday to the expanded schedule from 6 p.m. Monday until 6 p.m. Saturday in Subdistrict 1 marine waters west of Cape Nome.

JUSTIFICATION: The Nome Subdistrict escapement range goal of 23,000-35,000 chum salmon will easily be exceeded this year. At the Eldorado River, escapement is 11,000 chum salmon and that exceeds the escapement goal range of 6,000 to 9,200 chum salmon. Historically, mid-July is average midpoint of the chum salmon run at Eldorado River weir. At Snake River, 800 chum salmon have passed the weir (escapement goal range is 1,600 to 2,500 chum salmon). At Nome River, 1,150 chum salmon have passed the weir (escapement goal range is 2,900 to 4,300 chum salmon). Mid-July is average first-quarter point of the chum salmon run at both Snake and Nome weirs. Nome and Snake rivers are the index rivers for escapement west of Cape Nome and with both projected to reach escapement goal ranges the department is expanding to a 5-day a week subsistence set gillnet fishing schedule west of Cape Nome.

Emergency Order: 3-S-Z-22-13 Effective Date: July 18, 2013

EXPLANATION: This emergency order opens the marine waters from the Cape Nome jetty eastward to Topkok Head in Subdistrict 1 of the Norton Sound Subdistrict, the Nome Subdistrict, for one 24-hour period from 6:00 p.m. Thursday, July 18 to 6:00 p.m. Friday, July 19. Permit holders in Subdistrict 1 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: The Nome Subdistrict commercial chum salmon fishery was closed in 1991 due to chronically low runs and difficulty meeting escapement needs. Since the mid-2000s, runs of chum salmon to the Nome Subdistrict have been sufficient to meet escapement goals in most years and provide surpluses for subsistence harvest needs. As a result, the State of Alaska Board of Fisheries passed regulations in January, 2013 allowing for a commercial chum salmon fishery based on conservative management guidelines. Additionally, the board adopted regulations that divided Nome Subdistrict into two management areas: one from Cape Nome east to Topkok Head, and another from Cape Nome west to Cape Rodney. This regulation was adopted to provide the department with

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guidance to manage subsistence and commercial salmon fisheries east or west of Cape Nome based on escapement information from drainages located east or west of Cape Nome.

The chum salmon escapement goal range has already been achieved at Eldorado River, the index river for chum salmon escapement east of Cape Nome, and a limited commercial chum salmon fishery should not jeopardize subsistence uses or escapement needs. Projections of chum salmon escapement based on historical data for western Nome Subdistrict drainages will most likely approach or exceed the upper bound of established escapement goal ranges. As of July 16, cumulative escapement counts of chum salmon at the Eldorado, Nome, and Snake Rivers are 12,788, 1,263, and 872 chum salmon, respectively. Harvestable surpluses of chum salmon are available east of Cape Nome and there is buyer interest to purchase these fish.

Emergency Order: 3-S-Z-23-13 Effective Date: July 17, 2013

EXPLANATION: This emergency order opens Subdistrict 2, the Golovnin Bay Subdistrict of the Norton Sound District, to commercial salmon fishing for one 48-hour period directed at pink salmon from 6:00 p.m. Wednesday, July 17 to 6:00 p.m. Friday, July 19. Permit holders are restricted to gillnets with a mesh size of four and one-half inches or less.

JUSTIFICATION: Golovin Subdistrict salmon fisheries are being managed this season based on escapement data from the Kwiniuk River tower, located in Subdistrict 3, the nearby Elim Subdistrict. The Niukluk River tower project is no longer operational to assess escapements in season in the Golovin Subdistrict. However, the Kwiniuk River tower-based escapement goal threshold of 8,400 pink salmon is projected to be reached and there is buyer interest in pink salmon. Additionally, the former Niukluk River escapement goal threshold of 10,500 pink salmon has been achieved continually since 1998, and there are no concerns meeting subsistence and escapement needs this season.

There were no directed chum salmon openings this season in Subdistrict 2 as a result of a weak chum salmon run. The Subdistricts 2 and 3 management plan does not allow for commercial pink salmon fishing to occur before July 14 in the Golovin Subdistrict in years of low chum salmon abundance. However, the bulk of the chum salmon run is believed to be in river by this time and pink salmon commercial fishing should not have a negative impact on chum salmon escapements in the Fish River drainage. Pink salmon run strength will be indexed using comparative catch statistics from this opening and Kwiniuk River tower counts in order to determine if more commercial fishing opportunity can be provided while not jeopardizing subsistence uses of pink salmon.

Emergency Order: 3-S-Z-24-13 Effective Date: July 19, 2013

EXPLANATION: This emergency order reopens Subdistrict 5 of the Norton Sound Subdistrict, the Shaktoolik Subdistrict, for one 72-hour period from 6:00 p.m. Friday, July 19 to 6:00 p.m. Monday, July 22. Permit holders in Subdistricts 5 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Chum salmon abundance in the Shaktoolik River drainage is more than sufficient to warrant additional fishing time in Subdistricts 5. Apportioned sonar count estimated passage for the Shaktoolik River is 36,000 chum salmon. Additional opportunity to target chum salmon for commercial purposes is warranted due to the large chum salmon surplus.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-25-13 Effective Date: July 19, 2013

EXPLANATION: This emergency order reopens Norton Sound Subdistrict 6, the Unalakleet Subdistrict, for one 72-hour period from 6:00 p.m. Friday, July 19 to 6:00 p.m. Monday, July 22. Permit holders in Subdistricts 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6

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inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Cumulative chum salmon passage at the Unalakleet River weir now stands at over 63,000 chum salmon as of July 18. Escapement needs of chum salmon have been achieved and inriver abundance of chum salmon is more than sufficient to provide for subsistence uses of Unalakleet Subdistrict residents.

Given the near record abundance of chum salmon, longer commercial periods directed on chum salmon are warranted in Subdistrict 6. This additional opportunity to target chum salmon for commercial purposes is being provided because recent incidental harvests of king salmon have been very low.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-26-13 **Effective Date:** July 20, 2013

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay Subdistrict, for one 72-hour period from 6:00 p.m. Saturday, July 20 to 6:00 p.m. Tuesday, July 23. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Norton Bay fishermen have already harvested over 27,000 chum salmon this season, which is above the previous record harvest of 21,973 taken back in 1978. Escapement of chum salmon into Norton Bay salmon-producing drainages has also been strong as indexed by the NSEDC-operated Inglutalik River tower. Cumulative passage of chum salmon at Inglutalik River tower is over 42,000 fish, which is tracking similar to the 2011 season when over 64,000 chum salmon were counted. Current levels of inriver chum salmon abundance are more than sufficient to meet subsistence needs and provide escapements to ensure future returns of chum salmon. The increase in commercial fishing time is warranted because large harvestable surpluses of chum salmon remain in Norton Bay and there continues to be buyer interest.

Emergency Order: 3-S-Z-27-13 **Effective Date:** July 20, 2013

EXPLANATION: This emergency order reopens the marine waters from the Cape Nome jetty eastward to Topkok Head in Subdistrict 1 of the Norton Sound Subdistrict, the Nome Subdistrict, for one 24-hour period from 12:00 p.m. Saturday, July 20 to 12:00 p.m. Sunday, July 21. Permit holders in Subdistrict 1 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: The Nome Subdistrict commercial chum salmon fishery was closed in 1991 due to chronically low runs and difficulty meeting escapement needs. Since the mid-2000s, runs of chum salmon to the Nome Subdistrict have been sufficient to meet escapement goals in most years and provide surpluses for subsistence harvest needs. As a result, the State of Alaska Board of Fisheries passed regulations in January, 2013 allowing for a commercial chum salmon fishery based on conservative management guidelines. Additionally, the board adopted regulations that divided Nome Subdistrict into two management areas: one from Cape Nome east to Topkok Head, and another from Cape Nome west to Cape Rodney. This regulation was adopted to provide the department with guidance to manage subsistence and commercial salmon fisheries east or west of Cape Nome based on escapement information from drainages located east or west of Cape Nome.

Escapement needs of chum salmon in drainages east of Cape Nome have already been met. Eldorado River weir chum salmon passage is nearly 16,000 fish, which is well above the escapement goal range of 6,000–9,200 chum salmon. Harvestable surpluses of chum salmon are available for commercial utilization east of Cape Nome. Normal and late run timing projections also suggest the upper end the Nome and Snake River escapement goal ranges in the western half of the Nome Subdistrict will also be reached. Commercial openings west of Cape Nome are possible next week if escapement counts continue to improve.

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Emergency Order: 3-S-Z-28-13 Effective Date: July 20, 2013

EXPLANATION: This emergency order reopens Subdistrict 2, the Golovnin Bay Subdistrict of the Norton Sound District, to commercial salmon fishing for 48 hours from 6:00 p.m. Saturday, July 20 to 6:00 p.m. Monday, July 22. This period is directed at chum salmon and permit holders will be restricted to gillnets with a mesh size of 6 inches or less.

JUSTIFICATION: Commercial chum salmon fishing was not allowed in Golovin Bay this season until now. This period is being established because department biologists observed an estimated 16,000 chum salmon in the Boston Creek tributary alone, as well as several thousand chum salmon at the confluence of the Niukluk and Fish Rivers during an aerial survey July 18. The chum salmon run to the Fish River appears to be very late this season, but escapement of chum salmon into the Fish River has improved dramatically from counts from a July 9 survey. July 18 survey results indicate chum salmon escapement to the Niukluk River has a good chance of nearing the former tower-based escapement goal threshold of 23,000 chum salmon. Additionally, the bulk of the Niukluk River chum salmon run is now considered to be in river by this date. Thus, Niukluk River chum salmon should comprise a miniscule proportion of the commercial harvest during the upcoming opening. Niukluk River tower is no longer operational, but department will fly a peak spawning ground survey at the end of the month to index overall escapement of chum salmon into the Niukluk River. Incidental coho salmon harvests from this period will also provide an early index of coho salmon run strength to Golovin Subdistrict.

Emergency Order: 3-S-Z-29-13 Effective Date: July 20, 2013

EXPLANATION: This emergency order opens all marine waters from Carson Creek eastward to Iron Creek in Norton Sound Subdistrict 3, the Elim Subdistrict, to commercial salmon fishing for 48 hours from 6:00 p.m. Saturday, July 20 to 6:00 p.m. Monday, July 22.

JUSTIFICATION: Elim Subdistrict has not been opened this season because of conservation concerns with chum salmon based on Kwiniuk River tower escapement falling short of the escapement goal. Interestingly, however, the nearby Tubutulik River escapement goal range is projected to be reached based on an early July survey of 4,600 chum salmon. A commercial fishing period is being allowed for 48 hours, but commercial fishing will be limited to the western half of the Elim Subdistrict from Carson Creek eastward to Iron Creek. This will provide commercial permit holders with some late opportunity to target chum salmon, while minimizing the impact to the Kwiniuk River chum salmon escapement. Spawning ground surveys will also be flown later this month to index this season's Tubutulik River chum salmon escapement. The department will evaluate catch statistics and escapement information following these openings to determine if additional commercial opportunity is warranted.

Emergency Order: 3-S-Z-30-13 Effective Date: July 19, 2013

EXPLANATION: This emergency order raises the sockeye salmon subsistence catch limit to 50 fish at Pilgrim River.

JUSTIFICATION: The Pilgrim River weir count for sockeye salmon is 9,309 fish through July 18. This year's sockeye salmon run is already the best since 2008 and run timing projections give a final count of between 15,000 and 20,000 fish. Raising the limit to 50 sockeye salmon should not jeopardize the escapement goal of 4,000 to 8,000 sockeye salmon observed by aerial survey in Salmon Lake.

Emergency Order: 3-S-Z-31-13 Effective Date: July 22, 2013

EXPLANATION: This emergency order closes all fresh waters of the Shaktoolik and Unalakleet River drainages to subsistence salmon fishing effective 12:01 a.m. Monday, July 22, and immediately reopens subsistence salmon fishing in the Shaktoolik and Unalakleet River drainages 24 hours a day, 7 days a week. However, this emergency limits subsistence salmon fishing to set gillnets with a mesh size not greater than 6 inches.

JUSTIFICATION: Current cumulative escapement counts of Chinook salmon on the North and Unalakleet River

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projects are 380 and 690 Chinook salmon, respectively. Projected escapement at the North River is expected to range between 530–850 Chinook salmon, whereas the Unalakleet River mainstem projected escapement is expected to range from 800 to 1,000 Chinook salmon. The latest assessment indicates that the North River tower-based escapement goal range of 1,200–2,600 Chinook salmon will not be achieved this season. Additionally, cumulative Unalakleet River weir passage to date also suggests that the Unalakleet River aerial survey goal range of 550–1,100 Chinook salmon will also not be reached this season. Normally, subsistence fishing for salmon would be allowed with unrestricted mesh size in freshwater areas at this time of year. However, the exceptionally late, but weak run of Chinook salmon warrants additional restrictions to protect Chinook salmon that will contribute to the spawning escapement and provide future returns.

Emergency Order: 3-S-Z-32-13 Effective Date: July 23, 2013

EXPLANATION: This emergency order reopens the marine waters from the Cape Nome jetty eastward to Topkok Head in Subdistrict 1 of the Norton Sound Subdistrict, the Nome Subdistrict, for one 24-hour period from 12:00 p.m. Tuesday, July 23 to 12:00 p.m. Wednesday, July 24. Permit holders in Subdistrict 1 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: The Nome Subdistrict commercial chum salmon fishery was closed in 1991 due to chronically low runs and difficulty meeting escapement needs. Since the mid-2000s, runs of chum salmon to the Nome Subdistrict have been sufficient to meet escapement goals in most years and provide surpluses for subsistence harvest needs. As a result, the State of Alaska Board of Fisheries passed regulations in January, 2013 allowing for a commercial chum salmon fishery based on conservative management guidelines. Additionally, the board adopted regulations that divided Nome Subdistrict into two management areas: one from Cape Nome east to Topkok Head, and another from Cape Nome west to Cape Rodney. This regulation was adopted to provide the department with guidance to manage subsistence and commercial salmon fisheries east or west of Cape Nome based on escapement information from drainages located east or west of Cape Nome.

The Nome Subdistrict chum salmon escapement goal range of 23,000 to 35,000 fish has been achieved and will easily be exceeded this year. There are also three rivers that have escapement goals. The escapement goal range at Eldorado River is 6,000 to 9,200 chum salmon and the escapement this season is over double the high end of the range. At Snake River the escapement goal range is 1,600 to 2,500 chum salmon and has been met and will likely be exceeded. At Nome River the escapement goal range is 2,900–4,300 chum salmon and the escapement is 1,700 chum salmon through Sunday, July 21. The average midpoint of chum passage at the weir is July 23 so Nome River is projected to meet escapement.

Emergency Order: 3-S-Z-33-13 Effective Date: July 23, 2013

EXPLANATION: This emergency order reopens Subdistrict 5 of the Norton Sound Subdistrict, the Shaktoolik Subdistrict, for one 72-hour period from 12:00 p.m. Tuesday, July 23 to 12:00 p.m. Friday, July 26. Permit holders in Subdistricts 5 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Chum salmon abundance in the Shaktoolik River drainage is more than sufficient to warrant additional fishing time in Subdistricts 5. Apportioned sonar count estimated passage for the Shaktoolik River is 52,000 chum salmon. Additional opportunity to target chum salmon for commercial purposes is warranted due to the large chum salmon surplus.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-34-13 Effective Date: July 23, 2013

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EXPLANATION: This emergency order reopens Norton Sound Subdistrict 6, the Unalakleet Subdistrict, for one 72-hour period from 6:00 p.m. Tuesday, July 23 to 6:00 p.m. Friday, July 26. Permit holders in Subdistricts 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Cumulative chum salmon passage at the Unalakleet River weir now stands at over 76,000 chum salmon as of July 18. Escapement needs of chum salmon have been achieved and inriver abundance of chum salmon is more than sufficient to provide for subsistence uses of Unalakleet Subdistrict residents. Given the above average abundance of chum salmon, longer commercial periods directed on chum salmon are warranted in Subdistrict 6.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-35-13 **Effective Date:** July 23, 2013

EXPLANATION: This emergency order reopens Subdistrict 2, the Golovin Bay Subdistrict of the Norton Sound District, to commercial salmon fishing for 24 hours from 6:00 p.m. Tuesday, July 23 to 6:00 p.m. Wednesday, July 24. This period is directed at chum salmon and permit holders will be restricted to gillnets with a mesh size of 6 inches or less.

JUSTIFICATION: Commercial chum salmon fishing was not allowed in Golovin Bay this season until now. This period is being established because department biologists observed an estimated 16,000 chum salmon in the Boston Creek tributary alone, as well as several thousand chum salmon at the confluence of the Niukluk and Fish Rivers during an aerial survey July 18. The chum salmon run to the Fish River appears to be very late this season, but escapement of chum salmon into the Fish River has improved dramatically from counts from a July 9 survey. July 18 survey results indicate chum salmon escapement to the Niukluk River has a good chance of nearing the former tower-based escapement goal threshold of 23,000 chum salmon. Additionally, the bulk of the Niukluk River chum salmon run is now considered to be in river by this date. Thus, Niukluk River chum salmon should comprise a miniscule proportion of the commercial harvest during the upcoming opening. Niukluk River tower is no longer operational, but department will fly a peak spawning ground survey at the end of the month to index overall escapement of chum salmon into the Niukluk River. Incidental coho salmon harvests from this period will also provide an early index of coho salmon run strength to Golovin Subdistrict.

Emergency Order: 3-S-Z-36-13 **Effective Date:** July 24, 2013

EXPLANATION: This emergency order opens all marine waters from Carson Creek eastward to Iron Creek in Norton Sound Subdistrict 3, the Elim Subdistrict, to commercial salmon fishing for 24 hours from 6:00 p.m. Wednesday July 24 to 6:00 p.m. Thursday July 25.

JUSTIFICATION: Elim Subdistrict has not been opened this season because of conservation concerns with chum salmon based on Kwiniuk River tower escapement falling short of the escapement goal. Interestingly, however, the nearby Tubutulik River escapement goal range is projected to be reached based on an early July survey of 4,600 chum salmon. A commercial fishing period is being allowed for 48 hours, but commercial fishing will be limited to the western half of the Elim Subdistrict from Carson Creek eastward to Iron Creek. This will provide commercial permit holders with some late opportunity to target chum salmon, while minimizing the impact to the Kwiniuk River chum salmon escapement. Spawning ground surveys will also be flown later this month to index this season's Tubutulik River chum salmon escapement. The department will evaluate catch statistics and escapement information following these openings to determine if additional commercial opportunity is warranted.

Emergency Order: 3-S-Z-37-13 **Effective Date:** July 25, 2013

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay

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Subdistrict, for one 64-hour period from 8:00 a.m. Thursday, July 25 to 12:00 midnight Saturday evening, July 27. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Norton Bay fishermen have already harvested nearly 30,000 chum salmon this season, which is above the previous record harvest of 21,973 taken back in 1978. Escapement of chum salmon into Norton Bay salmon-producing drainages has also been strong as indexed by the NSEDC-operated Inglutalik River tower. Cumulative passage of chum salmon at Inglutalik River tower is over 42,000 fish, which is more than sufficient to meet subsistence needs and provide escapements to ensure future returns of chum salmon. The increase in commercial fishing time is warranted because large harvestable surpluses of chum salmon remain in Norton Bay and there continues to be buyer interest. The department will switch to coho salmon management once coho salmon catches exceed chum salmon catches.

Emergency Order: 3-S-Z-38-13 **Effective Date:** July 26, 2013

EXPLANATION: This emergency order reopens the all marine waters in Subdistrict 1 of the Norton Sound Subdistrict, the Nome Subdistrict, for one 24-hour period from 12:00 p.m. Friday, July 26 to 12:00 p.m. Saturday, July 27. Permit holders in Subdistrict 1 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: The Nome Subdistrict commercial chum salmon fishery was closed in 1991 due to chronically low runs and difficulty meeting escapement needs. Since the mid-2000s, runs of chum salmon to the Nome Subdistrict have been sufficient to meet escapement goals in most years and provide surpluses for subsistence harvest needs. As a result, the State of Alaska Board of Fisheries passed regulations in January, 2013 allowing for a commercial chum salmon fishery based on conservative management guidelines. Additionally, the board adopted regulations that divided Nome Subdistrict into two management areas: one from Cape Nome east to Topkok Head, and another from Cape Nome west to Cape Rodney. This regulation was adopted to provide the department with guidance to manage subsistence and commercial salmon fisheries east or west of Cape Nome based on escapement information from drainages located east or west of Cape Nome.

The Nome Subdistrict chum salmon escapement goal range of 23,000 to 35,000 fish has been achieved and will easily be exceeded this year. There are also three rivers that have escapement goals. The escapement goal range at Eldorado River is 6,000 to 9,200 chum salmon and the escapement this season is over double the high end of the range. The Snake and Nome River escapement goals have also been achieved and escapements at these rivers will likely approach or exceed the upper bound of their respective escapement goal ranges. This brief commercial period will also not jeopardize subsistence uses or escapement needs of chum salmon in the Nome Subdistrict.

Emergency Order: 3-S-Z-39-13 **Effective Date:** July 27, 2013

EXPLANATION: This emergency order reopens Subdistrict 5 of the Norton Sound Subdistrict, the Shaktoolik Subdistrict, for one 72-hour period from 6:00 p.m. Saturday, July 27 to 6:00 p.m. Tuesday, July 30. Permit holders in Subdistricts 5 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Chum salmon abundance in the Shaktoolik River drainage is more than sufficient to warrant additional fishing time in Subdistricts 5. Apportioned sonar count estimated passage for the Shaktoolik River is 52,000 chum salmon. Additional opportunity to target chum salmon for commercial purposes is warranted due to the large chum salmon surplus. The department will transition to coho salmon management next week.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-40-13 **Effective Date:** July 27, 2013

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EXPLANATION: This emergency order reopens Norton Sound Subdistrict 6, the Unalakleet Subdistrict, from 6:00 p.m. Saturday, July 27 to 6:00 p.m. Tuesday, July 30. Permit holders in Subdistricts 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during these directed chum salmon openings.

JUSTIFICATION: Cumulative chum salmon passage at the Unalakleet River weir is nearly 84,000 chum salmon as of July 25. Escapement needs of chum salmon have been achieved and inriver abundance of chum salmon is more than sufficient to provide for subsistence uses of Unalakleet Subdistrict residents. Given the above average abundance of chum salmon, longer commercial periods directed on chum salmon are warranted in Subdistrict 6. However, the department will switch to coho salmon management next week and use shorter index periods of 48 hours in duration in order to assess coho salmon run strength.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-41-13 **Effective Date:** July 28, 2013

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay Subdistrict, for 72 hours from 6:00 p.m. Sunday, July 28 to 6:00 p.m. Wednesday, July 31. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Norton Bay fishermen have already harvested 30,000 chum salmon this season, which is well above the previous record harvest of 21,973 taken back in 1978. Escapement of chum salmon into Norton Bay salmon-producing drainages has also been strong as indexed by the NSEDC-operated Inglutalik River tower. Cumulative passage of chum salmon at Inglutalik River tower is over 46,000 fish, which is more than sufficient to meet subsistence needs and provide escapements to ensure future returns of chum salmon. The increase in commercial fishing time is warranted because large harvestable surpluses of chum salmon remain in Norton Bay and there continues to be buyer interest. The department will switch to coho salmon management next week and use historical catch statistic comparisons with current year catch statistics to adjust fishing time in Norton Bay.

Emergency Order: 3-S-Z-42-13 **Effective Date:** July 31, 2013

EXPLANATION: This emergency order reopens the all marine waters in Subdistrict 1 of the Norton Sound Subdistrict, the Nome Subdistrict, for one 24-hour period from 12:00 p.m. Wednesday, July 31 to 12:00 p.m. Thursday, August 1. Permit holders in Subdistrict 1 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: The Nome Subdistrict chum salmon escapement goal range of 23,000 to 35,000 fish has been exceeded this year. There are also three rivers that have escapement goals. The Snake and Nome River escapement goals have also been achieved and escapements at these rivers will likely approach or exceed the upper bound of their respective escapement goal ranges. This brief commercial period will also not jeopardize subsistence uses or escapement needs of chum salmon in the Nome Subdistrict.

Emergency Order: 3-S-Z-43-13 **Effective Date:** August 1, 2013

EXPLANATION: This emergency order reopens Subdistrict 2, the Golovnin Bay Subdistrict of the Norton Sound District, to commercial salmon fishing for 24 hours from 6:00 p.m. Thursday, August 1 to 6:00 p.m. Friday, August 2. This period is directed at chum salmon and permit holders will be restricted to gillnets with a mesh size of 6 inches or less.

JUSTIFICATION: This period is being established to index early run strength of coho salmon. Catch statistics from this period will be compared to historical catch statistics to determine if additional commercial fishing is justified. Additional periods may be allowed if catch statistics indicate that continued commercial fishing will not jeopardize

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subsistence uses or escapement needs of coho salmon in the Fish River drainage and other drainages emptying into Golovin Lagoon. Aerial surveys will be flown on the spawning grounds in late August or early September to index spawning escapement of coho salmon in the Fish River drainage.

Emergency Order: 3-S-Z-44-13 Effective Date: August 1, 2013

EXPLANATION: This emergency order opens all marine waters from Carson Creek eastward to Iron Creek in Norton Sound Subdistrict 3, the Elim Subdistrict, to commercial salmon fishing for 24 hours from 6:00 p.m. Thursday, August 1 to 6:00 p.m. Friday August 2.

JUSTIFICATION: This will provide commercial permit holders with some early opportunity to target coho salmon and provide an early index of coho salmon run strength. Kwiniuk River tower personnel have enumerated 100 coho salmon as of July 28, which is above counts from the 2010–2012 seasons for this date. In all years with counts this high for July 28, escapements of coho salmon have been more than sufficient to meet the aerial survey escapement goal (650–1,300 cohos), provide for inriver subsistence harvests, and allow for commercial harvests. However, it is too early to ascertain if the run is merely early or if the good initial counts indicate good early run strength. Tower counts and catch statistics from this index opening will be evaluated to determine if additional commercial harvest opportunities can be allowed. Spawning ground surveys will also be flown later this month to index this season's Tubutulik River coho salmon escapement.

Emergency Order: 3-S-Z-45-13 Effective Date: July 31, 2013

EXPLANATION: This emergency order reopens Subdistrict 5 and 6 of the Norton Sound Subdistrict, the Shaktoolik and Unalakleet Subdistricts, for one 48-hour period from 6:00 p.m. Wednesday, July 31 to 6:00 p.m. Friday, August 2. Permit holders in Subdistricts 5 and 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during this directed coho salmon opening.

JUSTIFICATION: Coho salmon abundance in southern Norton Sound as indexed by the Unalakleet River weir passage and North River tower passage is tracking ahead of counts during the 2011 and 2012 seasons. This initial opportunity to target coho salmon for commercial purposes is warranted to index early coho salmon run strength and recent run performance history suggests that this period will not negatively impact subsistence uses of coho salmon or jeopardize escapement needs of coho salmon in the Shaktoolik and Unalakleet River drainages. North River tower counts and historical radiotelemetry data will be analyzed to estimate inriver abundance of coho salmon to ensure that escapement and inriver subsistence uses of coho salmon will be met before committing to longer periods or a set schedule for the remainder of the season.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-46-13 Effective Date: August 2, 2013

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay Subdistrict, for 48 hours from 6:00 p.m. Friday, August 2 to 6:00 p.m. Sunday, August 4. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Coho salmon management begins this week and the department will use historical catch statistic comparisons with current year catch statistics to adjust fishing time in Norton Bay. Spawning ground surveys will be flown in late August to index the coho salmon spawning escapement to the Ungalik and Inglutalik Rivers, the major salmon producing drainages in Norton Bay.

Emergency Order: 3-S-Z-47-13 Effective Date: August 5, 2013

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EXPLANATION: This emergency order reopens Subdistrict 2, the Golovnin Bay Subdistrict of the Norton Sound District, to commercial salmon fishing for 36 hours from 12:00 p.m. Monday, August 5 to 12:00 a.m. Wednesday, August 7. This period is directed at coho salmon and permit holders will be restricted to gillnets with a mesh size of 6 inches or less.

JUSTIFICATION: This period is being established to provide additional commercial harvest opportunity directed on coho salmon. Catch statistics from this period will be compared to historical catch statistics to determine if additional commercial fishing is justified. The August 1st opening catch of 527 coho salmon in Golovin Subdistrict by 7 permit holders was 92% above the long-term average catch of 274 coho salmon for the first week of August. The latest catch statistics indicate that abundance of coho salmon will be sufficient to achieve escapement needs and provide for inriver subsistence uses of coho salmon. Catch statistics will be evaluated from this 36-hour opening to determine if additional fishing or periods of longer duration can be allowed without jeopardizing escapement or subsistence needs.

Additional periods may be allowed if catch statistics indicate that continued commercial fishing will not jeopardize subsistence uses or escapement needs of coho salmon in the Fish River drainage and other drainages emptying into Golovin Lagoon. Aerial surveys will be flown on the spawning grounds in late August or early September to index spawning escapement of coho salmon in the Fish River drainage.

Emergency Order: 3-S-Z-48-13 **Effective Date:** August 5, 2013

EXPLANATION: This emergency order opens all marine waters from Carson Creek eastward to Iron Creek in Norton Sound Subdistrict 3, the Elim Subdistrict, to commercial salmon fishing for 36 hours from 12:00 p.m. Monday, August 5 to 12:00 a.m. Wednesday August 7.

JUSTIFICATION: This brief opening will provide commercial permit holders with harvest opportunity to target coho salmon and provide an additional index of coho salmon run strength. In the Elim Subdistrict, 12 permit holders caught 457 cohos during the most recent 24 hours opening. This catch was slightly above average for the first week of August.

There have been 657 coho salmon enumerated at the Kwiniuk River as of midnight August 3, which is 21% below the 2008–2012 average count of 797 cohos for August 2. However, projected escapement estimates of coho salmon based on this count range from 3,900–6,800 coho salmon for the season for runs with early and normal migration timing, respectively.

Current comparative catch statistics and escapement information indicate that abundance of coho salmon is on track achieve escapement needs and provide for inriver subsistence uses of coho salmon in the Elim Subdistrict. Escapements and catch statistics will be evaluated from this 36-hour opening to determine if additional fishing or periods of longer duration can be allowed without jeopardizing escapement or subsistence needs. Escapement of coho salmon to Subdistrict 3 will be evaluated using tower counts at the Kwiniuk River and the Kwiniuk River aerial survey goal range of 650–1,300 fish. Spawning ground surveys will also be flown later this month to index this season's Tubutulik River coho salmon escapement.

Emergency Order: 3-S-Z-49-13 **Effective Date:** August 5, 2013

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay Subdistrict, for 48 hours from 6:00 p.m. Monday, August 5 to 6:00 p.m. Wednesday, August 7. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Coho salmon season is underway. Recent catches of coho salmon from the Norton Bay Subdistrict this past week were average to above average for early August. Additionally, 2,700 cohos have been harvested to date in Norton Bay which is on track to establish a new record harvest for Norton Bay Subdistrict.

During a July 30 aerial survey of the Ungalik River, department biologists observed over 1,000 coho salmon in the lower reach of the Ungalik. The good early survey count of coho salmon suggests that inriver abundance of coho salmon will be more than sufficient to provide for future returns and meet the subsistence priority. Peak spawning

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ground surveys will be flown in late August to index the coho salmon spawning escapement to the Ungalik River, the major coho salmon producing drainage in Norton Bay.

Emergency Order: 3-S-Z-50-13 Effective Date: August 4, 2013

EXPLANATION: This emergency order reopens Subdistrict 5 and 6 of the Norton Sound Subdistrict, the Shaktoolik and Unalakleet Subdistricts, to a commercial fishing schedule of two 48-hour periods per week until the end of the Subdistricts 5 and 6 season. Periods will be from 6:00 p.m. Sundays to 6:00 p.m. Tuesdays and from 6:00 p.m. Wednesdays to 6:00 p.m. Fridays. Permit holders in Subdistricts 5 and 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches. This emergency order also prohibits the sale of king salmon incidentally harvested during the directed coho salmon fishery.

JUSTIFICATION: Coho salmon abundance in southern Norton Sound as indexed by the North River tower passage is tracking well ahead of counts during the 2011 and 2012 seasons. This schedule will provide fishermen and the buyer with an orderly fishery. The schedule is warranted based on current projections of North River coho salmon escapement, projected Unalakleet River inriver coho salmon abundance, and recent run performance trends. This schedule is not expected to negatively impact subsistence uses of coho salmon or jeopardize escapement needs of coho salmon in the Shaktoolik and Unalakleet River drainages.

Escapement to the North River tributary is at 1,602 coho salmon as of August 3. Drainagewide escapement projections based on the North River tower count and historical radiotelemetry data range from 38,000–54,000 coho salmon for runs with early and normal migration timing, respectively. More importantly, this level of inriver abundance will be more than sufficient to achieve the North River aerial survey goal range of 550–1,100 fish and provide for inriver subsistence and sport fish harvest needs. Shaktoolik and Unalakleet Subdistricts will remain on this schedule for the remainder of the season unless projections decrease dramatically and reductions in fishing time are needed to ensure that subsistence harvest needs will not be jeopardized by commercial fishing.

Per the Subdistricts 5 and 6 King Salmon Management Plan, permit holders may retain but cannot sell king salmon incidentally harvested in the commercial salmon fishery. King salmon retained for subsistence purposes must be recorded in the personal use section of each fish ticket at the time of delivery.

Emergency Order: 3-S-Z-51-13 Effective Date: August 8, 2013

EXPLANATION: This emergency order reopens Subdistrict 2, the Golovnin Bay Subdistrict of the Norton Sound District, to commercial salmon fishing for 36 hours from 12:00 p.m. Thursday, August 8 to 12:00 a.m. Saturday, August 10. This period is directed at coho salmon and permit holders will be restricted to gillnets with a mesh size of 6 inches or less.

JUSTIFICATION: This period is being established to provide additional commercial harvest opportunity directed on coho salmon. The August 5th opening catch of 861 coho salmon in Golovin Subdistrict by 8 permit holders was 192% above the long-term average catch of 282 coho salmon for the first week of August. The August 5th catch was also the fifth best ever for a single period and the 2013 cumulative harvest of 1,700 cohos lags only behind the record 2010 season's catch for this date.

Additional periods may be allowed if catch statistics indicate that continued commercial fishing will not jeopardize subsistence uses or escapement needs of coho salmon in the Fish River drainage and other drainages emptying into Golovin Lagoon. Aerial surveys will be flown on the spawning grounds in late August or early September to index spawning escapement of coho salmon in the Fish River drainage.

Emergency Order: 3-S-Z-52-13 Effective Date: August 8, 2013

EXPLANATION: This emergency order opens all marine waters of Norton Sound Subdistrict 3, the Elim Subdistrict, to commercial salmon fishing for 36 hours from 12:00 p.m. Thursday, August 8 to 12:00 a.m. Saturday August 10.

JUSTIFICATION: This brief opening will provide commercial permit holders with harvest opportunity to target coho salmon and provide an additional index of coho salmon run strength. In the Elim Subdistrict, 9 permit holders

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caught 511 cohos during the most recent 36-hour opening. This catch was 19% above the average catch of 421 cohos for the first week of August.

There have been nearly 1,200 coho salmon enumerated at the Kwiniuk River as of 8:00 a.m. August 8, which is 18% below the 2008–2012 average count of 1,448 cohos for August 8. However, projected escapement estimates of coho salmon based on this count range from 4,200–5,700 coho salmon for runs with early and normal migration timing, respectively. Current catch statistics and escapement information indicate that abundance of coho salmon continues to build in Subdistrict 3 and will be sufficient to achieve escapement needs and provide for subsistence uses. Escapements and catch statistics will be evaluated from this 36-hour opening to determine if additional fishing or periods of longer duration can be allowed without jeopardizing escapement or subsistence needs. Escapement of coho salmon to Subdistricts 2 and 3 will be evaluated using tower counts at the Kwiniuk River and the Kwiniuk River aerial survey goal range of 650–1,300 fish.

Emergency Order: 3-S-Z-53-13 Effective Date: August 9, 2013

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay Subdistrict, for 48 hours from 6:00 p.m. Friday, August 9 to 6:00 p.m. Sunday, August 11. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Coho salmon season is underway. Recent catches of coho salmon from the Norton Bay Subdistrict this past week were average to above average for early August. Additionally, nearly 3,500 cohos have been harvested to date in Norton Bay which is on track to establish a new record harvest for Norton Bay Subdistrict this season.

During a July 30 aerial survey of the Ungalik River, department biologists observed over 1,000 coho salmon in the lower reach of the Ungalik. The good early survey count of coho salmon suggests that inriver abundance of coho salmon will be more than sufficient to provide for future returns and meet the subsistence priority. Peak spawning ground surveys will be flown in late August to index the coho salmon spawning escapement to the Ungalik River, the major coho salmon producing drainage in Norton Bay.

Emergency Order: 3-S-Z-54-13 Effective Date: August 11, 2013

EXPLANATION: This emergency order reopens Subdistricts 2 and 3 of the Norton Sound District, to commercial salmon fishing for 36 hours from 12:00 p.m. Sunday, August 11 to 12:00 a.m. Tuesday, August 13. This period is directed at coho salmon and permit holders will be restricted to gillnets with a mesh size of 6 inches or less.

JUSTIFICATION: This period is being established to provide additional commercial harvest opportunity directed on coho salmon. The August 8 opening catch of 1,476 coho salmon in Golovin Subdistrict by 7 permit holders was a record catch for one fishing period. Department staff plan to fly an aerial survey next week of the Niukluk River drainage to estimate early escapement numbers. In Elim Subdistrict the catch was 886 coho salmon by 14 permit holders and was average for this date. Escapement at Kwiniuk River counting tower is 1,254 coho salmon with the average first quarter point of passage at the tower on August 10. Projections show that escapement will be met. Continuing with short duration openings should not jeopardize reaching escapement goals or subsistence fishing opportunity.

Emergency Order: 3-S-Z-55-13 Effective Date: August 12, 2013

EXPLANATION: This emergency order opens Subdistrict 4 of the Norton Sound District to a fishing schedule of two 48-hour commercial fishing periods per week from 6:00 p.m. Monday to 6:00 p.m. Wednesday and from 6 p.m. Thursday until 6 p.m. Saturday through September 7. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Catches of coho salmon from the Norton Bay Subdistrict during recent 48 hour fishing periods have been average for mid-August. Additionally, nearly 4,200 coho salmon have been harvested to date in Norton

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Bay which is on track to establish a new record harvest for Norton Bay Subdistrict this season.

During a July 30 aerial survey of the Ungalik River, department biologists observed over 1,000 coho salmon in the lower reach of the Ungalik. The tower crew has enumerated over 5,000 coho salmon through August 11, but water has been high and turbid so there may be some doubt as to accurate speciation. The good early survey count of coho salmon suggests that inriver abundance of coho salmon will be more than sufficient to provide for future returns and meet the subsistence priority. Peak spawning ground surveys will be flown in late August to index the coho salmon spawning escapement to the Ungalik River, the major coho salmon producing drainage in Norton Bay.

Emergency Order: 3-S-Z-56-13 Effective Date: August 14, 2013

EXPLANATION: This emergency order reopens Subdistricts 2 and 3 of the Norton Sound District, the Golovin and Elim Subdistricts, to commercial salmon fishing for 48 hours from 6:00 p.m. Wednesday, August 14 to 6:00 p.m. Friday, August 16. This period is directed at coho salmon and permit holders will be restricted to gillnets with a mesh size of 6 inches or less.

JUSTIFICATION: This period is being established to maximize commercial harvest opportunity of coho salmon at the historical peak of the coho salmon run. The August 8 opening catch of 1,476 coho salmon in the Golovin Subdistrict was a record catch for one fishing period, and the August 11th catch of 940 was more than double the historical average catch for mid-August. On August 13th, department staff flew an early aerial survey of the Niukluk River drainage to estimate initial escapement numbers. There is no longer an escapement counting project at Niukluk River in the Golovin Subdistrict. However, 630 coho salmon were counted in the Niukluk River from Ophir Creek downstream to the Fish River confluence during an August 13 aerial survey conducted by department personnel under fair to poor viewing conditions. These early survey results suggest that coho salmon escapement will be achieved as the old aerial survey goal of 950–1,900 coho salmon correlated well with the tower-based goal of 2,400–7,200 coho salmon. The survey count of 630 fish is also considered to be very conservative because of the difficult viewing conditions. To ensure that escapement and subsistence needs of coho salmon are met, the department may need to reduce commercial fishing opportunity in Golovin Subdistrict if catch statistics drop below historical average catch statistics during this opening.

In Elim Subdistrict the catch was 734 coho salmon by 15 permit holders and was below average for this date. However, escapement at Kwiniuk River counting tower is nearly 1,800 coho salmon with the average first quarter point of passage at the tower on August 10. Projections show that the Kwiniuk River aerial survey escapement goal of 650–1,300 will be easily achieved. This 48-hour opening should also not jeopardize reaching escapement goals or subsistence fishing opportunity.

Emergency Order: 3-S-Z-57-13 Effective Date: August 19, 2013

EXPLANATION: This emergency order reopens Subdistricts 2 and 3 of the Norton Sound District, the Golovin and Elim Subdistricts, to commercial salmon fishing for 48 hours from 6:00 p.m. Monday, August 19 to 6:00 p.m. Wednesday, August 21. This period is directed at coho salmon and permit holders will be restricted to gillnets with a mesh size of 6 inches or less.

JUSTIFICATION: This period is being established to provide additional commercial harvest opportunity of coho salmon. An estimated 609 and 880 coho salmon were harvested in the Golovin and Elim Subdistricts during the most recent 48-hour opening ending Friday, August 16. Catches were above average in Golovin and average in Elim for the third week of August.

On August 13th, department staff flew an early aerial survey of the Niukluk River drainage to estimate initial escapement numbers. There is no longer an escapement counting project at Niukluk River in the Golovin Subdistrict. However, 630 coho salmon were counted in the Niukluk River from Ophir Creek downstream to the Fish River confluence during an August 13 aerial survey conducted by department personnel under fair to poor viewing conditions. These early survey results suggest that coho salmon escapement will be achieved as the old aerial survey goal of 950–1,900 coho salmon correlated well with the tower-based goal of 2,400–7,200 coho salmon.

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The survey count of 630 fish is also considered to be very conservative because of the difficult viewing conditions. Peak spawning ground surveys will be flown later this month.

Escapement of coho salmon in the Elim Subdistrict as indexed by Kwiniuk River counting tower is 2,250 coho salmon with the average midpoint of passage at the tower on August 20. Projections show that the Kwiniuk River aerial survey escapement goal of 650–1,300 will be easily achieved. Furthermore, continued commercial fishing with 48-hour openings and escapement windows between periods should also not jeopardize subsistence uses of coho salmon for Elim residents.

Emergency Order: 3-S-Z-58-13 Effective Date: August 22, 2013

EXPLANATION: This emergency order supersedes 3-S-Z-55-13 and closes the fishing period beginning at 6 p.m. August 22 and moves that scheduled 48-hour fishing period 24 hours later to now start at 6 p.m. Friday, August 23 and conclude at 6 p.m. Sunday, August 25. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: The buyer has requested that the scheduled fishing period be shifted to one day later. Because Subdistrict 4 is on a schedule of two 48-hour commercial salmon fishing periods per week there is no concern with shifting the fishing period to one day later.

Emergency Order: 3-S-Z-59-13 Effective Date: August 23, 2013

EXPLANATION: This emergency order reopens Subdistricts 2 and 3 of the Norton Sound District, the Golovin and Elim Subdistricts, to commercial salmon fishing for 48 hours from 6:00 p.m. Friday, August 23 to 6:00 p.m. Sunday, August 25. This period is directed at coho salmon and permit holders are restricted to gillnets with a mesh size of 6 inches or less.

JUSTIFICATION: The recent 48-hour fishing period in Subdistricts 2 and 3 had average catches when compared to the historical averages. The escapement goal is projected to be made in each subdistrict. The escapement goal is determined by aerial survey in Subdistrict 2 and is expected to be made based on an earlier aerial survey projection. The escapement goal in Subdistrict 3 is also determined by aerial survey and Kwiniuk River counting crew has enumerated four times the lower end of the coho salmon escapement goal needed by aerial survey. The upcoming fishing period should not jeopardize subsistence opportunity or escapement.

Emergency Order: 3-S-Z-60-13 Effective Date: August 27, 2013

EXPLANATION: This emergency order opens all marine waters of Norton Sound Subdistrict 3, the Elim Subdistrict, to commercial salmon fishing for one 48-hour period from 6:00 p.m. Tuesday, August 27 to 6:00 p.m. Thursday, August 29, and one 40-hour period from 8:00 a.m. Friday, August 30 to 12:00 midnight Saturday evening, August 31. Permit holders are limited to 100 fathoms of net with a mesh size no greater than 6 inches. This emergency order also closes the commercial salmon season in the Elim Subdistrict effective 12:00 midnight.

JUSTIFICATION: Escapement of coho salmon to Subdistrict 3 as indexed by Kwiniuk River tower counts is over 3,200 coho salmon. Current projections of inriver abundance based on these tower counts range from 4,100 and 5,300 cohos. This level of inriver abundance is sufficient to provide for upriver subsistence harvests of coho salmon and enough fish to achieve the Kwiniuk River aerial survey goal range of 650–1,300 fish. Catches of coho salmon in the commercial fishery continue to be average to above average for late August and these additional periods are warranted to utilize remaining harvestable surpluses.

Emergency Order: 3-S-Z-61-13 Effective Date: August 27, 2013

EXPLANATION: This emergency order supersedes emergency order 3-S-Z-55-13 and reopens Subdistrict 4 of the Norton Sound Subdistrict, the Norton Bay Subdistrict, to a new commercial fishing schedule of two 48-hour periods per week until the end of the Subdistrict 4 season, which closes by emergency order effective 6:00 p.m. Thursday,

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September 5. Periods will now be from 6:00 p.m. Tuesdays to 6:00 p.m. Thursdays and from 6:00 p.m. Fridays to 6:00 p.m. Sundays. Permit holders in Subdistrict 4 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Norton Bay fishermen have harvested a record 5,400 cohos this season. Commercial fishing effort has been minimal during the coho salmon season. Additionally, there were early indications in late July that inriver abundance of coho salmon would be sufficient to provide for subsistence uses and escapement needs of coho salmon. A July 30 aerial survey resulted in over 1,000 cohos counted in the lower Ungalik River. Additionally, previous years with similar fishing effort have had a limited impact on inriver abundance of coho salmon. Therefore, the limited level of participation in the commercial fishery coupled with escapement windows between periods should not jeopardize subsistence needs or have an adverse impact on escapements of coho salmon in Norton Bay drainages.

Emergency Order: 3-S-Z-62-13 **Effective Date:** September 9, 2013

EXPLANATION: : This emergency order opens the eastern end of Salmon Lake to subsistence salmon fishing. The catch limit is 100 sockeye salmon.

JUSTIFICATION: The escapement past Pilgrim River weir was over 12,000 sockeye salmon and the aerial survey goal of 4,000 to 8,000 sockeye salmon in Salmon Lake was easily reached. The majority of sockeye salmon spawn in the western half of Salmon Lake and that area remains closed by regulation. Because there are sufficient numbers of spawning salmon the department will allow subsistence salmon fishing in that area of the lake where fishing will allow some take of salmon to provide subsistence opportunity.

NORTON SOUND SALMON – SPORT FISH

Emergency Order: 3-KS-04-13 **Effective Date:** June 17, 2013

EXPLANATION: This emergency order prohibits the retention of king salmon in all waters of the Unalakleet and Shaktoolik river drainages, effective 12:01 a.m., Monday, June 17, 2013, and prohibits the use of bait while sport fishing in these rivers.

Emergency Order: 3-KS-08-13 **Effective Date:** July 11, 2013

EXPLANATION: This emergency order supersedes Emergency Order No. 3-KS-04-13. This emergency order closes all waters to sport fishing for king salmon, and prohibits the use of bait while sport fishing, in the Unalakleet and Shaktoolik river drainages effective 12:01 A.M. Thursday, July 11, 2013.

APPENDIX H: ARCTIC FISHERIES

Appendix H1.—Commercial freshwater finfish harvest and sales, Colville River, Arctic Area, 1990–2007.

| Year | Number of fish harvested intended for commercial sale ^a | | | | | Estimated commercial sales based on fish tickets | |
|-----------|--|---------------------|-------------------------|-------------------------|---------------|--|--------------------------------|
| | Broad whitefish | Humpback whitefish | Least Cisco (“herring”) | Arctic Cisco (“kaktok”) | Total harvest | Arctic Cisco | Whitefish species ^b |
| 1990 | 0 | 5,694 | 21,003 | 19,374 | 46,071 | 12,571 ^c | 14,249 ^c |
| 1991 | 0 | 1,240 | 5,697 | 13,805 | 20,742 | 1,970 ^d | 3,307 ^d |
| 1992 | 126 | 5,209 | 6,962 | 20,939 | 33,236 | ^e | 10,200 ^f |
| 1993 | 20 | 5,339 | 6,037 | 31,310 | 42,706 | 11,291 ^d | 6,170 ^d |
| 1994 | – | 6,056 ^g | 10,176 | 8,958 | 25,190 | 7,434 ^d | 4,121 ^d |
| 1995 | – | 33,794 ^h | – | – | 33,794 | 13,921 | 6,000 |
| 1996 | – | 6,425 ^g | 7,796 | 21,817 | 36,038 | 9,076 | 4,127 |
| 1997 | – | 1,721 ^g | 10,754 | 9,403 | 21,878 | 9,403 | 4,760 |
| 1998 | – | 4,881 ^g | 9,936 | 7,019 | 21,836 | 5,648 | 7,105 |
| 1999 | – | 6,875 ^g | 7,430 | 8,832 | 23,137 | 7,095 | 6,170 |
| 2000 | – | 3,706 ^g | 5,758 | 2,619 | 12,083 | 2,809 | 6,569 |
| 2001 | – | 6,078 ^g | 2,839 | 1,740 | 10,657 | 1,779 | 7,306 |
| 2002 | – | 4,183 ^g | 5,503 | 3,935 | 13,621 | 899 | 4,093 |
| 2003 | – | 6,463 ^g | 4,777 | 5,627 | 16,867 | 0 | 1,292 |
| 2004 | – | 1,145 ^g | 3,061 | 3,061 | 7,267 | 2,412 ^f | 476 |
| 2005 | – | 490 ^g | 2,870 | 9,343 | 12,703 | 2,975 ^f | 2,170 |
| 2006 | – | 1,188 ^g | 4,995 | 3,293 | 9,476 | 1,482 ^f | 3,655 |
| 2007 | – | 462 ^g | 2,265 | 390 | 3,117 | ^e | ^e |
| 2002-2006 | | | | | | | |
| Average | – | 2,694 | 4,241 | 5,052 | 11,987 | 1,554 | 2,337 |

^a Reported on daily catch form returned to ADF&G. Catch reports were returned to the department following the fishing season. All fish reported on the catch report were harvested with the intent to sell. Dashes indicate information is not available.

^b Whitefish species include mostly humpback whitefish and least cisco, with occasional broad whitefish.

^c Commercial harvest estimate based on one fish ticket average weights of 0.89 lb (900 Arctic cisco at 800 lb) and 0.61 lb (1,400 whitefish species at 850 lb).

^d Estimated commercial harvest sales based on 1995 to 2001 average weight of 0.92 lb for Arctic cisco and 0.89 lb for whitefish species (humpback and broad whitefish, and least cisco).

^e No information is available from fish tickets indicating that harvested fish were sold commercially.

^f Mixed commercial harvest of mostly Arctic cisco along with humpback whitefish, broad whitefish, and least cisco. Estimated commercial harvest sales based on 1995 to 2001 combined average of \$1.07/lb. for whitefish species and Arctic cisco.

^g Humpback whitefish harvest includes undetermined amounts of broad whitefish.

^h Humpback whitefish harvest includes undetermined amounts of broad whitefish, least cisco, and Arctic cisco.