Fishery Management Report No. 13-28

2012 Annual Management Report Norton Sound-Port Clarence Area, and Arctic-Kotzebue Area

by

Jim Menard,

Joyce Soong,

Scott Kent,

and

Ashley Brown

July 2013

Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

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)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
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

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

FISHERY MANAGEMENT REPORT NO. 13-28

2012 ANNUAL MANAGEMENT REPORT NORTON SOUND-PORT CLARENCE AREA, AND ARCTIC-KOTZEBUE AREA

by
Jim Menard, Joyce Soong, Scott Kent, and Ashley Brown
Alaska Department of Fish and Game, Division of Commercial Fisheries, Nome

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

July 2013

The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/ This publication has undergone regional peer review.

Jim Menard, Joyce Soong, Scott Kent, and Ashley Brown
Alaska Department of Fish and Game, Division of Commercial Fisheries,
P.O. Box 1148, Nome, AK 99762, USA

This document should be cited as:
Menard, J., J. Soong, S. Kent, and A. Brown. 2013. 2012 Annual management report Norton Sound-Port Clarence Area, and Arctic-Kotzebue. Alaska Department of Fish and Game, Fishery Management Report No. 13-28, Anchorage.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF APPENDICES (Continued)

LIST OF APPENDICES (Continued)

LIST OF APPENDICES (Continued)

ABSTRACT

This report provides information about the 2012 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, Fishery Management Report, AMR, FMR.

INTRODUCTION

This report summarizes the 2012 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 special management and research projects are included in this report. A more complete documentation of project results is presented in separate reports.

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

This report is organized into the following major sections:

1) 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 1–15 present annual data, and 2) appendices generally present historical comparisons. Not all appendices are cited in the text, and 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, 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.

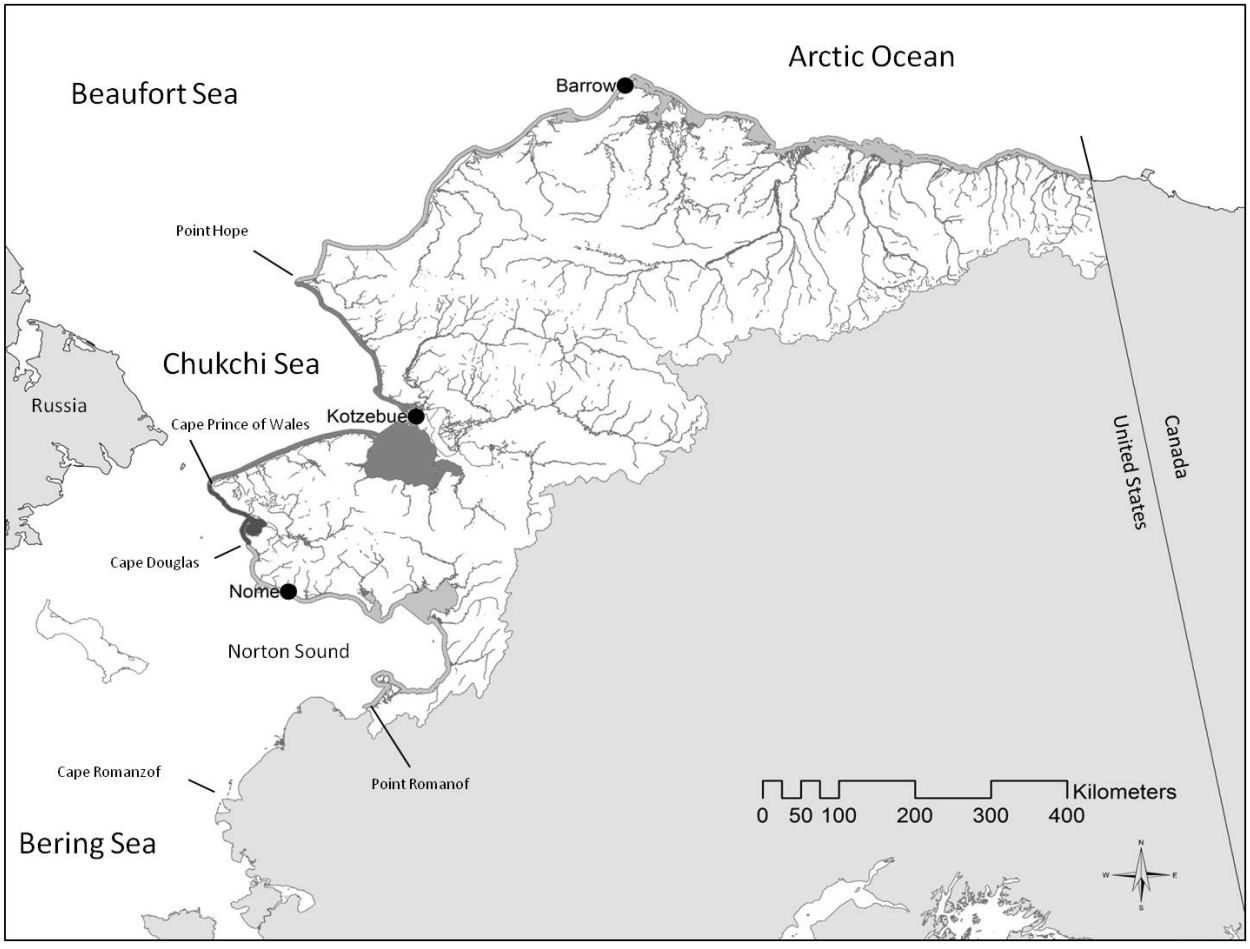


Figure 1.–Norton Sound, Port Clarence, Kotzebue Sound and Arctic management districts.

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; however, 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 livelihood.

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 less

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 yearly in Shaktoolik and Unalakleet and in other southern Norton Sound villages periodically.

Prior to the fishing season one visit by ADF&G personnel is usually made 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 all permit holders who did not return their household permit by phone or letter. Also, trips to villages are made postseason by ADF&G personnel to collect permits and discuss the fishing season.

In southern Norton Sound, in 2012, postseason household surveys were conducted in Unalakleet, Shaktoolik, Stebbins, Saint Michael, and Koyuk. Surveyors attempt to contact all households. ADF&G staff uses 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.

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 documenting: 1) 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 2012 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 2012, 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 supplemented salmon escapement monitoring activities of the area staff.

The main objective of ADF&G's program is to manage commercial and subsistence salmon fisheries on a sustained yield basis. 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 difficulties in obtaining accurate escapement data and insufficient comparative catch and return information. Management difficulties are compounded by the need to provide not only for adequate escapements, but also for 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 2012 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 one major salmon-producing stream (Figure 2).

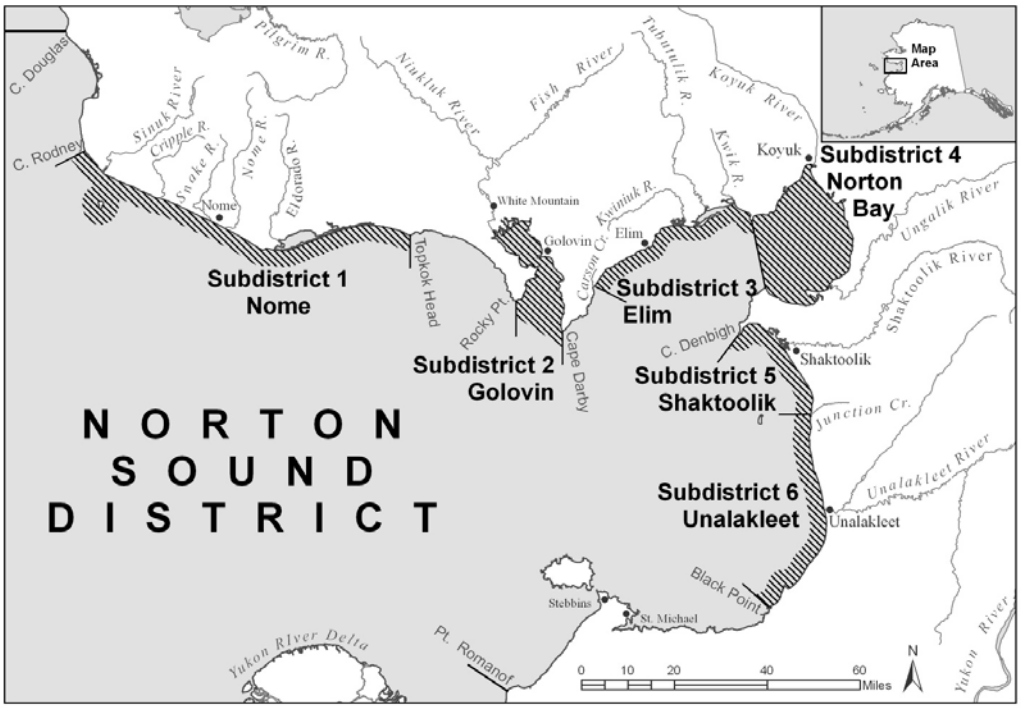


Figure 2.–Norton Sound commercial salmon fishing subdistricts.

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 (Bockstoce 1979). The largest pre-contact settlements on the Bering Strait Islands and the western Seward Peninsula were located where marine mammals were the primary subsistence resource. The rest of the region's population lived in small groups scattered along the coast, often moving seasonally to access fish and wildlife resources (Thomas 1982). During summer months, residents would usually disperse in groups comprised 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 impacted fish populations significantly. Nearly every stream on the Seward Peninsula has had some sort of mining operation, ranging from simple gold panning to sluice boxes to hydraulic giants to bucket line dredges. One example of extensive impact is the Solomon River, which is only 30 miles long but had 13 dredges working at one time. Another obvious impact was 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 and the rest they bartered or sold to mining camps, roadhouses, and trading posts or stores. For example, the Haycock mining camp on the Koyuk River bought about 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 more fish were retained 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. Yet, 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 a lb and then sell them for $0.10 a 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, 2 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 gives a list of commercial processors and buyers that operated in Norton Sound and Kotzebue Sound in 2012.

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 had often terminated their operations before regulatory closure dates. 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 have occurred in the Nome Subdistrict since 1996. By regulation commercial chum salmon fishing is closed in Nome Subdistrict and the fishery may not be reopened again until the abundance of chum salmon has a harvestable surplus large enough to meet subsistence needs for 4 consecutive years. In the case of pink salmon, there had been no market interest and coho salmon runs have not had a market interest in those years when large runs have occurred because of capacity problems with the good catches in other subdistricts (Appendix A6). There was market interest in Nome Subdistrict pink salmon in 2012, but restrictions on chum salmon commercial fishing would have required fishermen to release all chum salmon caught regardless if they were dead or alive, and ADF&G chose not to open commercial pink salmon fishing.

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 in stretched mesh. In Unalakleet and Shaktoolik Subdistricts, 8.25 in 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 in 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 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 inter-annual 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 2012, there were 4 counting towers and 6 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 remains closed to commercial chum salmon fishing by regulation. The Norton Bay Subdistrict often has healthy stocks, but 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 2012 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 (2002–2011), the average subsistence harvest was 72,102 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–G8.

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. Subsistence salmon harvests for 2012 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 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 in 2011 and 2012 all subsistence salmon permits issued were returned or permit holders reported catches in person, by telephone or email.

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 1, 2 AND 3

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 non-local stocks. A 1978–1979 Norton Sound stock separation study (Gaudet and Schaefer 1982) showed that 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 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 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 return. 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. 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.

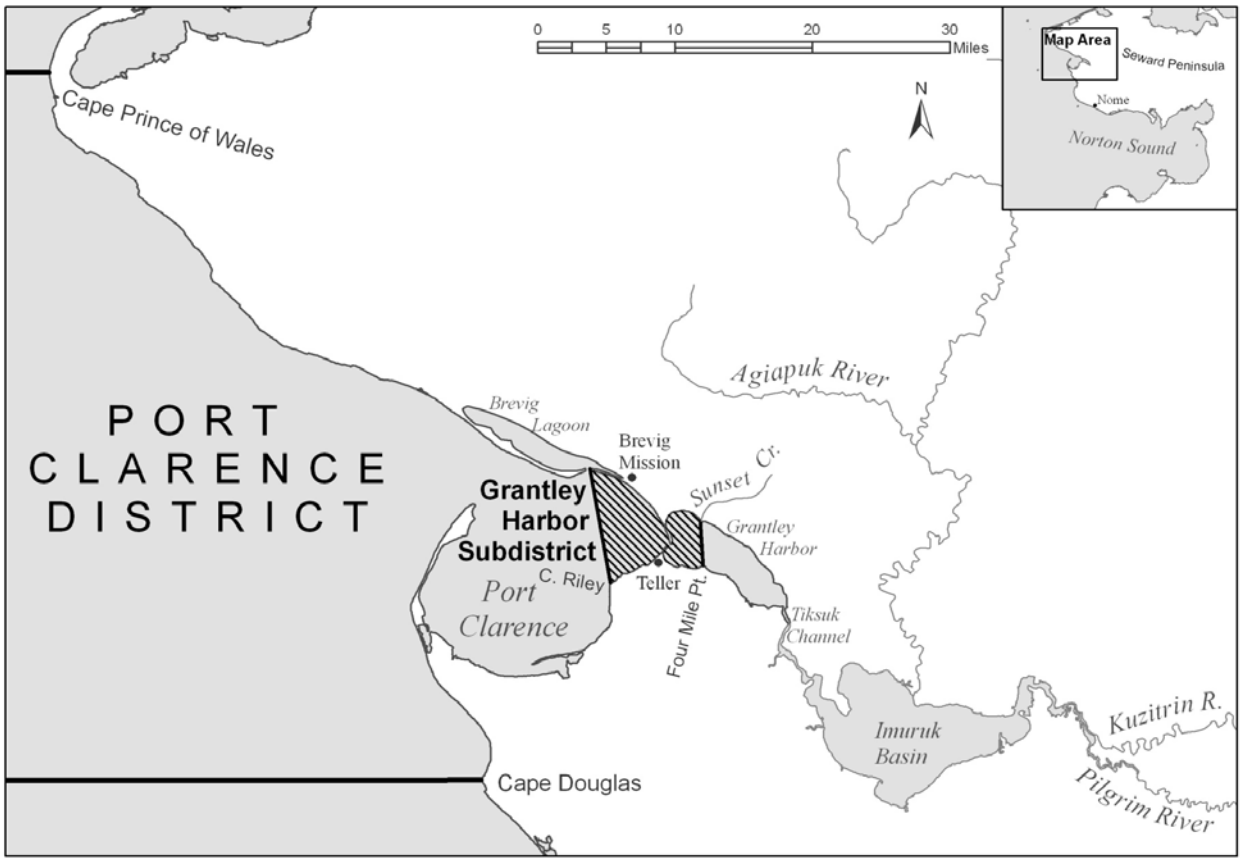
In 2001, chum salmon runs began to improve in Nome Subdistrict and additional permits were issued in the Tier II chum salmon fishery. Beginning in 2004, BOF expanded the salmon subsistence permit requirement for the Norton Sound area to include all marine waters, and fresh waters flowing into marine 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.

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.



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

Figure 3.–Port Clarence District.

COMMERCIAL FISHERY OVERVIEW

Some subsistence caught salmon are believed to be sold or bartered each year in Teller and Nome, but commercial fishing has been limited in Port Clarence District. In 1966, a total of 1,146 salmon consisting of 93 sockeye salmon, 131 pink salmon, and 922 chum salmon were taken in a commercial fishery (ADF&G 1967) in the Grantley Harbor/Tuksuk Channel area. Since then, commercial salmon fishing in this district had been prohibited due to relatively small runs in this area and the existence of a subsistence fishery. However, large increases in sockeye salmon runs in the mid-2000s and positive results from an ADF&G test fishery in 2006 led to the opening of a limited commercial fishery beginning in 2007 with a catch of 1,152 sockeye salmon and 3,183 chum salmon. In 2008 the commercial 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

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.

Village subsistence surveys were conducted annually by Division of Commercial Fisheries up 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 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.

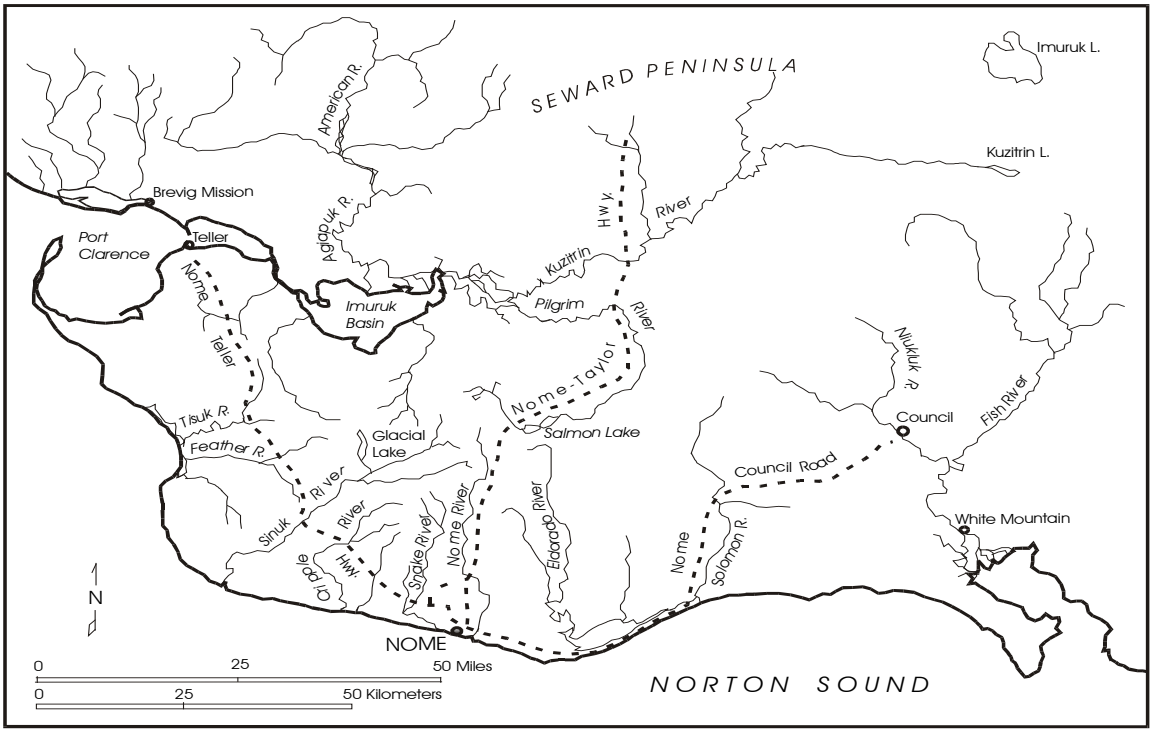


Figure 4.–Seward Peninsula with road accessible waters.

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 if 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.

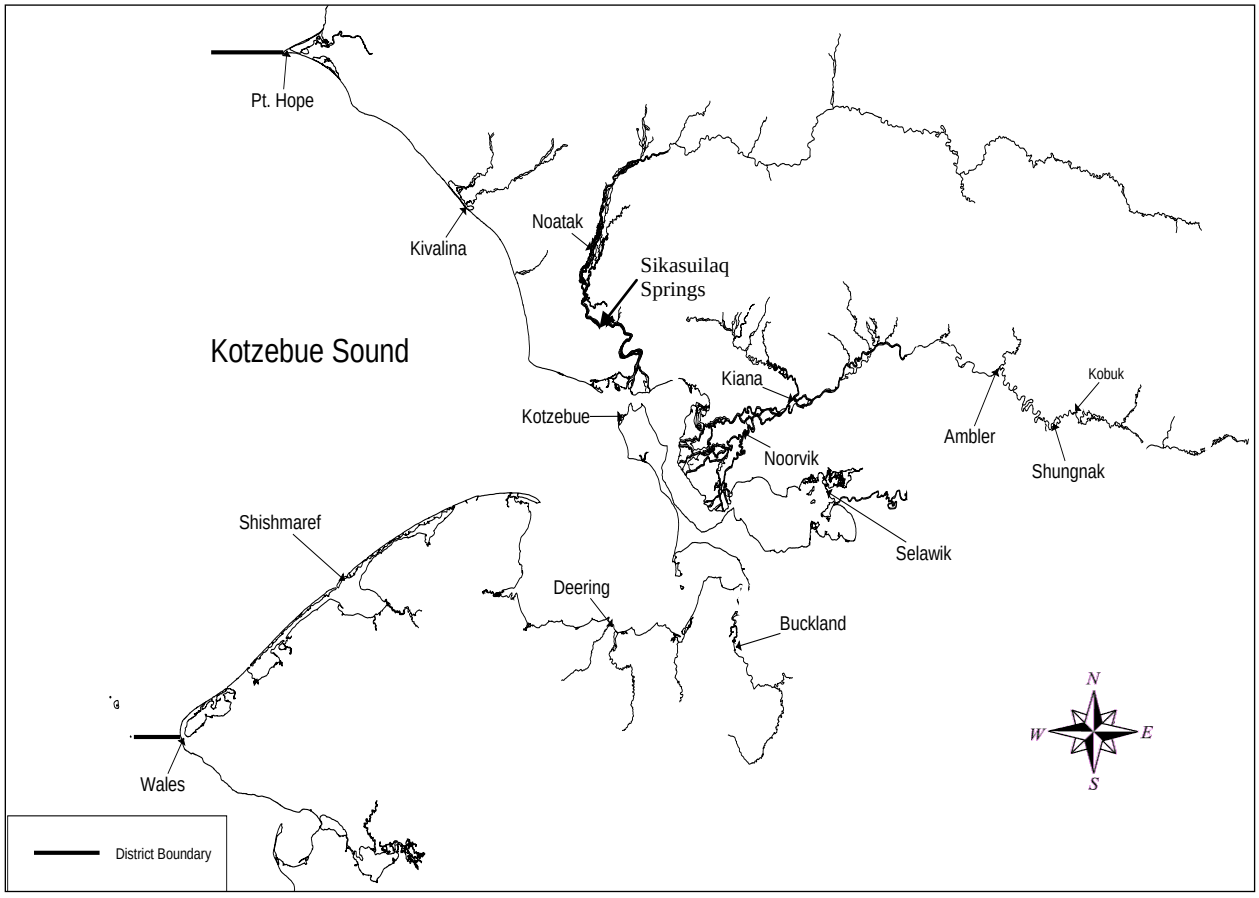


Figure 5.–Kotzebue Sound District, villages and subsistence fishing area.

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.

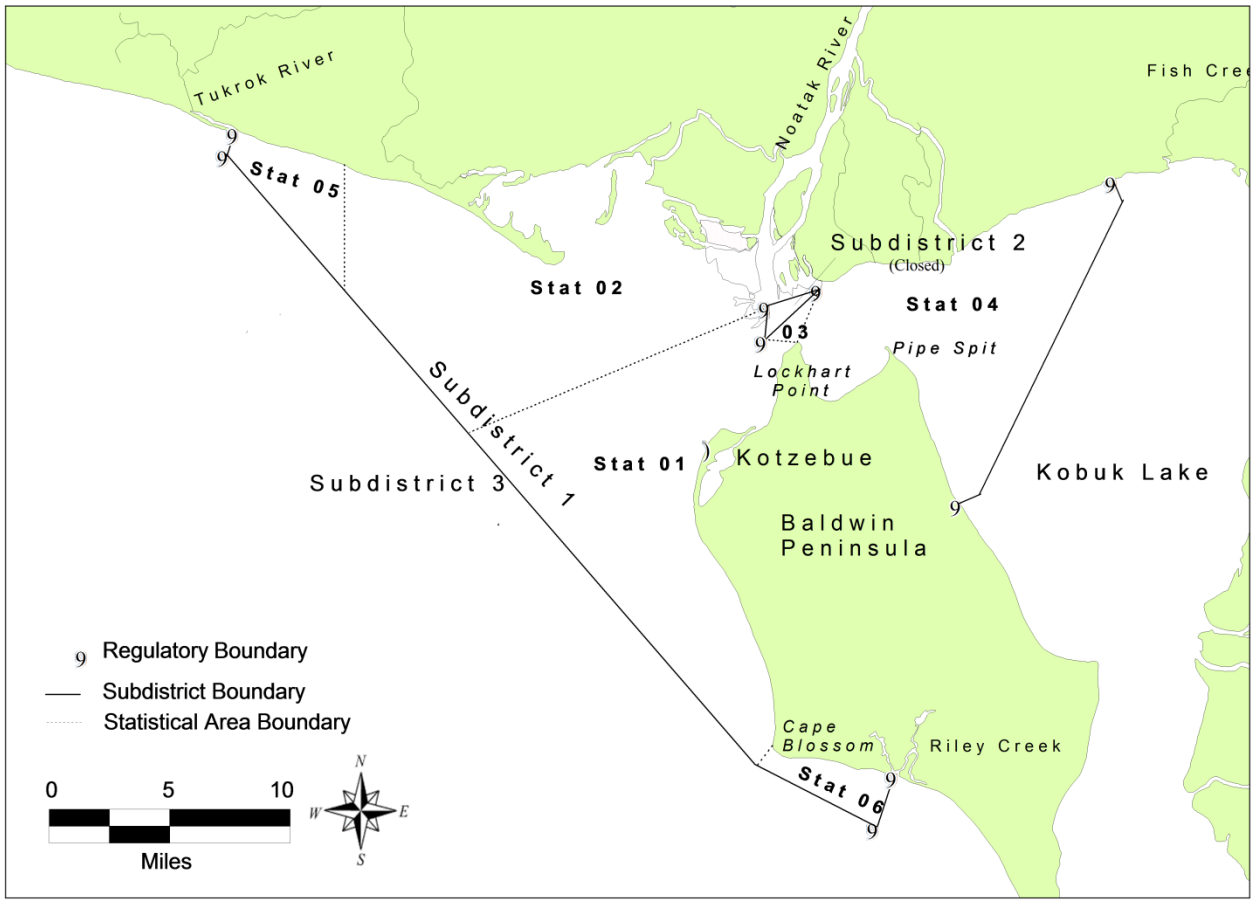


Figure 6.–Kotzebue Sound commercial salmon fishing subdistricts and statistical areas.

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 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 approximately 50% in 1997.

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. Predominate species in the district is chum salmon, though small numbers of other salmon species are present.

Historical subsistence surveys for the Kotzebue area have been less complete than 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 conducted annual household subsistence salmon surveys in select Kotzebue District communities. Due to budget constraints these surveys were discontinued after 2004. 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 Chikchi Sea, Beaufort Sea and Arctic Ocean (Figure 7).

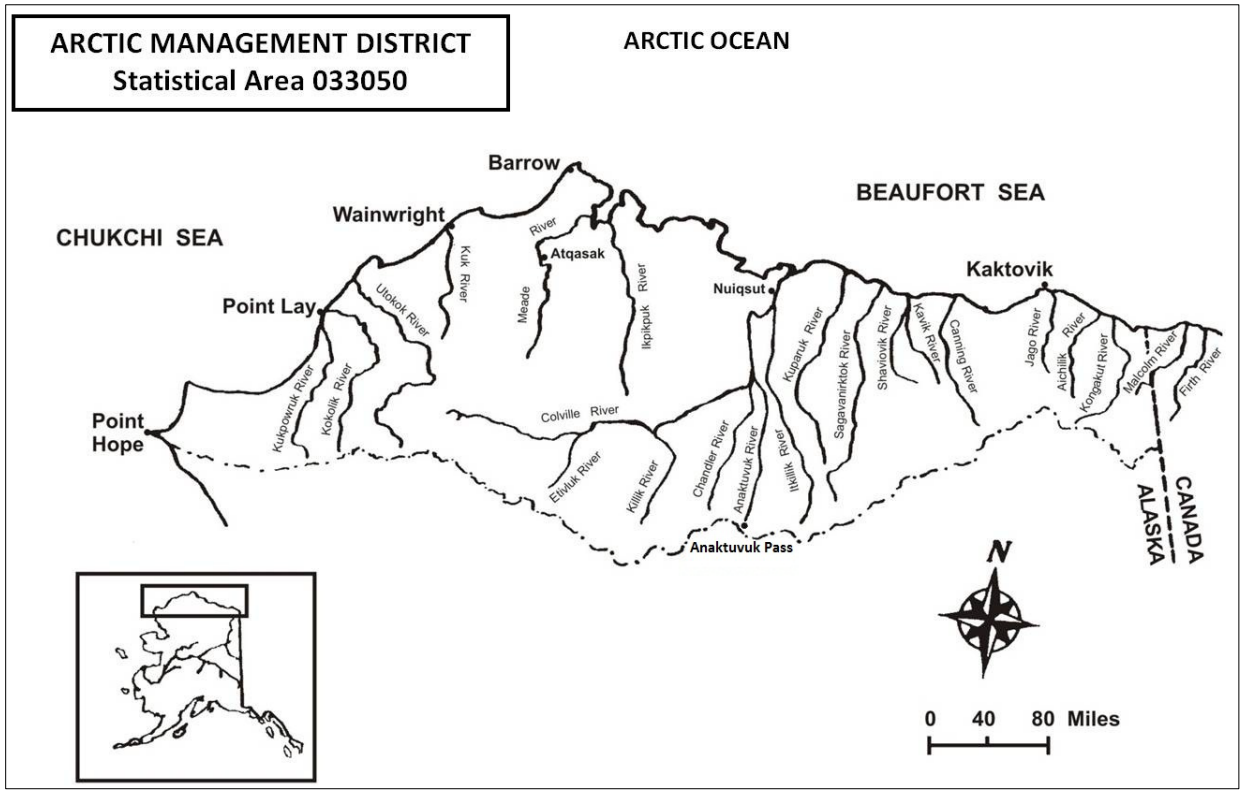


Figure 7.–Arctic management district.

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. 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).

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-Kiwalik 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.

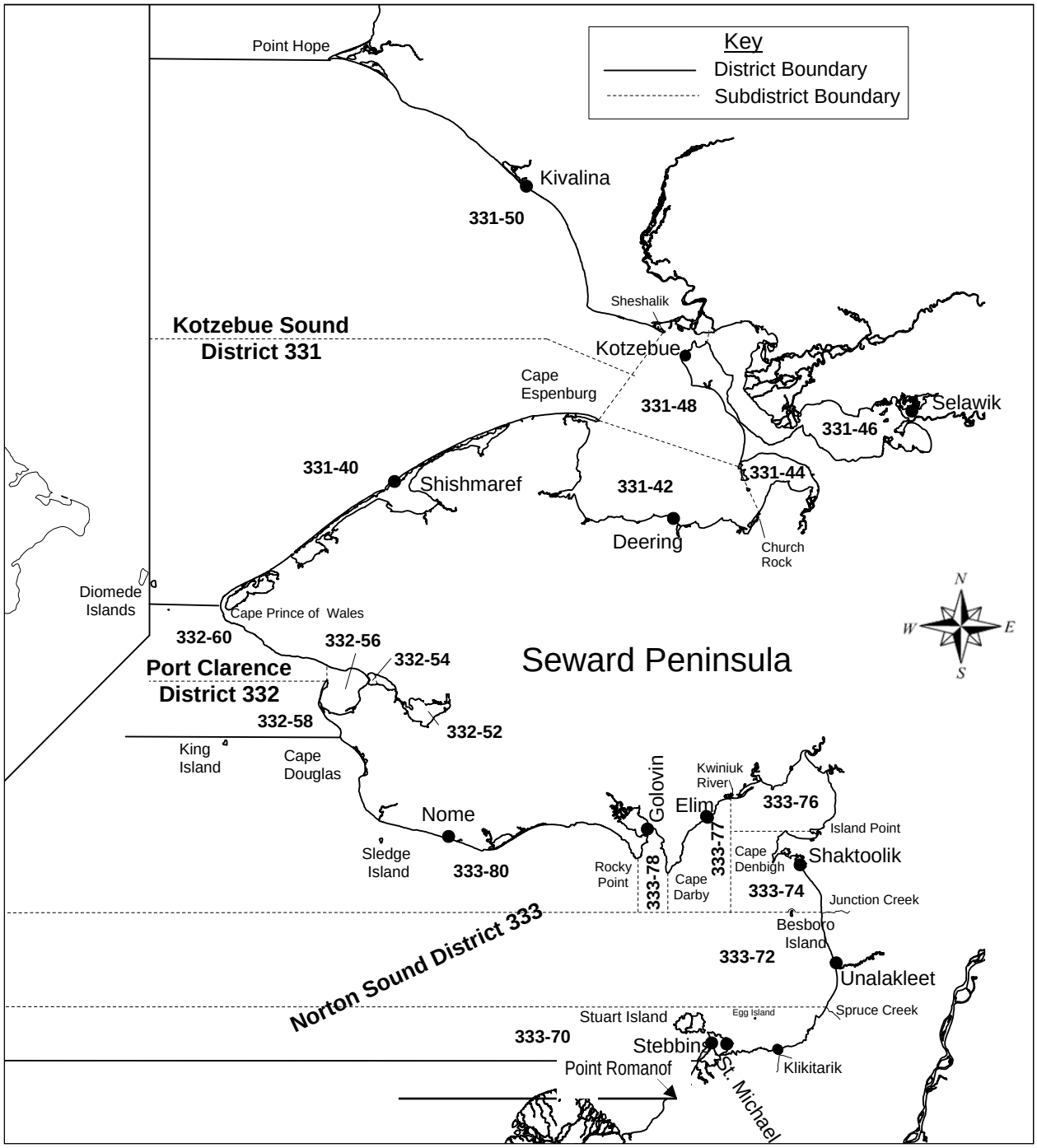


Figure 8.–Commercial herring districts and statistical areas of Norton Sound, Port Clarence, and Kotzebue Sound.

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 (Appendix D1). Domestic commercial fishing resumed for "spring herring" in Norton Sound in 1964 near Unalakleet and continued sporadically until 1979. Between 1964 and 1978, the fishery averaged about 10 tons of herring annually for sac roe extraction (Appendix D1). In 1979, a domestic herring fishery for sac roe began on a larger scale in Norton Sound when approximately 1,292 tons of herring were taken by 63 fishermen (13 purse seiners, 50 gillnetters). Purse seiners took 70% of the total catch.

After the 1979 season, BOF adopted a public proposal which made gillnets and beach seines the only legal commercial herring fishing gear within Norton Sound. A purse seine fishery could only be opened if the gillnet fleet could not take the allowable harvest. 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 (Appendices D3 and D4). 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 exists 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 (Appendix D3). This effort was more than twice the average from 1980 through 1986, yet Norton Sound area residents accounted for only 36% of the effort and 29% of the 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.

The 1988 and 1989 Norton Sound sac roe fisheries were about average, with approximately 4,400 tons harvested each year by gillnet, and an average of 284 tons each year by beach seine. The 1990 gillnet harvest of approximately 6,032 tons was the highest on record until 1995 when the harvest was 6,033 tons. In 1992, no harvest occurred because of very late ice breakup. The 1993 beach seine harvest of approximately 742 tons was the largest harvest on record by this gear type, though it was not the highest in total gross earnings. Low prices and declining market conditions resulted in a below average harvest in 1994, but the highest earnings on record were

in 1995 and 1996 for both the beach seine and gillnet fisheries (Appendix D3). More recently, the 5-year average harvest for 2002–2006 was 1,073 tons for gillnet and no harvest for beach seine. Since 1997, poor market conditions have been the primary influence on the level of commercial harvest. There were no sac roe herring buyers in 2004 due to lack of market interest and only 11 tons of bait herring were harvested. Only 1 buyer was present during the 2005 season, when 1,951 tons were harvested, and again in 2006, only 1 buyer was present, purchasing 671 tons. In 2007, 2008 and 2009 there were no sac roe herring buyers, and 33, 91 and 28 tons of bait herring, respectively, were harvested. One buyer was present in 2010, and 688 tons of herring were harvested from a quota of over 8,000 tons. One bright spot was the record recovery of 13.5% in the sac roe gillnet fishery. The herring fishery in 2011 was even more successful than the previous year, with a harvest of 739 tons of sac roe and 67 tons of bait herring. Additionally, the previous year's record recovery was exceeded by the new record percent roe of 14.8%.

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 (Appendix D1). 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. ADF&G shall manage the herring pound spawn-on-kelp fishery to achieve this level by restricting the number of blades of kelp that may be suspended from a herring pound: (1) no more than a total of 75,000 blades of kelp are allowed in the fishery; and (2) the maximum number of blades of kelp any permit holder may attach to a herring pound is 3,000; if more than 25 permits are issued for this fishery, ADF&G shall determine the number of blades of kelp a permit holder may attach to a herring pound by dividing 75,000 by the number of permits issued.

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 D3).

Food and Bait Fishery

Early records indicate about 3,200 tons of "fall herring" were processed in Norton Sound from 1916 to 1941 (Appendix D1). This fishery, dependent on salt curing, declined because foreign competition produced poor marketing conditions. 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 (Appendix D2). 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 food and bait herring harvest estimates were initially harvested as sac roe, but bought and processed as food and bait, thus 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 (Appendix D4). 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. The belief that ripe females approach the beach at that time to spawn, figures heavily in this strategy. Because the Norton Sound fishery covers a large area with varying tides, opening at the optimal time throughout the district is not always possible. The fishing fleet must be flexible to maximize catches and roe quality. 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 roe on kelp 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 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 D5).

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.
Zosteria sp. primary spawning substrate.	*Fucus* sp. 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 which winter near the Pribilof Islands and migrate to the western Alaska coast to spawn. Migration to central Bering Sea for wintering herring stocks along the western Seward Peninsula is unlikely; rather they might remain in coastal lagoons, bays or inlets which are warmed by river discharge under the ice (Barton 1978). Size difference may be explained by warmer water temperatures from river discharge. Water temperatures and feeding conditions in deep ocean waters are probably more favorable for growth than those in herring winter habitats along the Seward Peninsula, where apparently they have become adapted to Arctic conditions (Barton 1978).

Aerial surveys are difficult in Port Clarence District because of organic coloring of waters of Imuruk Basin, Tuksuk Channel, and 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, which becomes highly stained over winter and takes time to clear once ice melts. Typically, outside waters are significantly warmer than inside waters, which are covered by ice longer thereby slowing solar gain and water mixing. Soon after ice begins to shift, herring move into the warm shallow lagoons to spawn. Herring are invisible to aerial observation once they enter stained water. The best aerial survey conditions exist just outside the entrance to Port Clarence, where herring mass just before the ice moves. In each of the past several years 1 or 2 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).

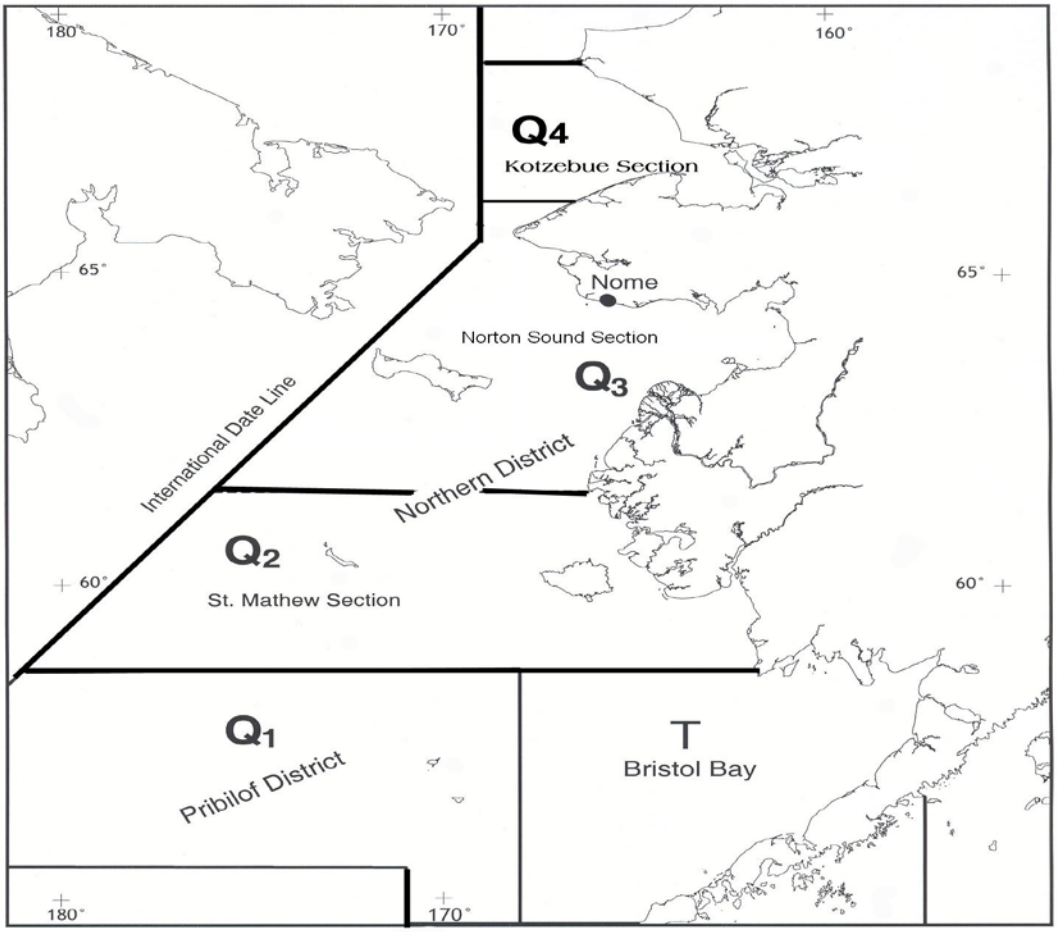


Figure 9.–King crab fishing districts and sections of Statistical Area Q.

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, winter and summer pot studies, and summer and winter fisheries (Appendices E13–E24), the model is used to project abundance estimates of legal male crabs 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, it estimates current abundance as well as revises prior years' abundances. It should be noted that estimates prior to 1996 are currently under review as 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.

The following estimates are based on the model's results from spring of 2012 with the latest data from the 2011 trawl survey, the 2011 summer fishery, and the 2010–2011 winter study. In 2007, legal abundance estimate for the summer crab fishery was 2.52 million lb, similar to the 2.61 million lb estimated for 2006. The legal population estimate for 2008 increased 9% from the 2007 estimate, to 2.75 million lb, and increased again the following year, up another 8% to 2.98 million lb in 2009. Increases in abundance estimates were seen again the following 2 years, up 18% to 3.52 million lb in 2010 and up 8% to 3.82 million lb in 2011 (NPFMC 2011). Results from the 2006 and 2008 trawl surveys had forecasted this increase in legal abundance estimate based on the high number of prerecruit-2 male crab abundance estimated.

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). The record high overall male catch per unit of effort (CPUE) seen this year and relatively stable legal CPUE over the last 4 years suggests that this year's decline 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 next year, while prerecruit-2 crab require 2 molts, the above-average proportion of prerecruit-2 male crab in this year's catch indicates a possible recruitment surge in 2014.

COMMERCIAL FISHERY OVERVIEW

A large vessel summer commercial crab fishery existed in Norton Sound Section from 1977 through 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. 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 a vessel registered for the Norton Sound crab fishery may not be used to take king crab in any other registration area during that registration year. Later, a vessel moratorium put into place before the 1996 season was intended to precede a license limitation program. Community Development Quota (CDQ) groups were allocated a portion of the summer harvest beginning in 1998. Although CDQ allocation was in place, no harvest occurred until the 2000 season. The North Pacific License Limitation Program (LLP) went into effect for the Norton Sound crab fishery January 1, 2000. The program states a vessel which exceeds 32 feet in length overall must hold a valid crab license issued under 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 over fishing 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 sublegal and smaller female crabs, 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 one 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 in in carapace width (CW), the local seafood plant did not always buy crabs 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

The Norton Sound and Yukon Delta CDQ groups divided the CDQ allocation. Only fishermen designated by the Norton Sound and Yukon Delta 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 12:00 noon, June 15, or no less than 72 hours after commercial gillnet or beach seine herring fishing is closed, whichever is later, through 12:00 noon, June 28. After July 1, the commissioner may, by emergency order, open a CDQ fishery for any remaining allocation after closure of the open access fishery. 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 that began operating in Nome in summer 2002 greatly improved the ability of Nome ADF&G staff to sample crabs brought to the Nome dock. Crabs were either sampled at the Nome plant or at the small boat harbor where non-resident fishermen 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.

The first year subsistence permits were required, 1978, had the highest number of permits issued (290) and highest reported harvest (12,506 crab) (Appendix E5). The fishery declined sharply the following year and remained at low levels through the 1981–1982 season. Lack of success in the winter crab fishery during some past years has been attributed to a declining crab population caused by removal of crab in the summer commercial fishery together with low recruitment, low effort caused by poor ice conditions, and changes in nearshore winter distribution of crab. All these factors in varying degrees affect success of the winter fishery. During the 1978–1979 winter fishery, the king crab population was still relatively high. Despite this relatively large population, winter catches were second poorest on record indicating that major factors limiting winter catches were probably poor ice conditions and distribution of crab. During winter of 1981–1982, poor winter catches could more reasonably be attributed to a declining crab population since the crab population was at a low level. Subsistence fishing success during winters of 1982–1983 through 1986–1987 improved because of a rebuilding of the population and increased use of more efficient gear (pots instead of hand lines). Unstable ice conditions and record snowfalls adversely affected: 1992–1993, 1996–1997, 2000–2001, 2003–2004, and 2005–2006 catches. During years of stable ice conditions, approximately 100 fishermen averaged 100 crab 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 crabs, 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 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. 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

Commercial catches in the former St. Lawrence Island Section have only been reported for 4 years. In 1983, 52,557 lb of blue king crab was delivered from 13 landings. The commercial crab fleet concentrated their efforts near the southeast shore of St. Lawrence Island. In 1984, a regulation was adopted to close waters within 10 miles of all inhabited islands within the St. Lawrence Island Section (St. Lawrence Island, Little Diomede and King Island). This regulation attempts to protect stocks targeted by local fishermen and reduce impacts on marine mammal subsistence harvests. In 1989, 3,603 lb of red king crabs and 984 lb of blue king crabs were delivered from 8 landings. In 1992, 53 lb of blue king crabs were landed. In 1995, 7,913 lb of blue king crabs were delivered from 3 landings (Bue et al. 1997).

Only 1 permit fished in 2005 in the Kotzebue area, harvesting 316 lb of red king crab[1]. This was the first reported commercial king crab harvest in the St. Lawrence Island Section since 1995. Except for 340 lb harvested in 2006, no commercial king crab harvest has been reported from the former St. Lawrence Island Section since 2005.

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

[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 as some information is confidential.] Hereafter referenced as "fish ticket database".

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).

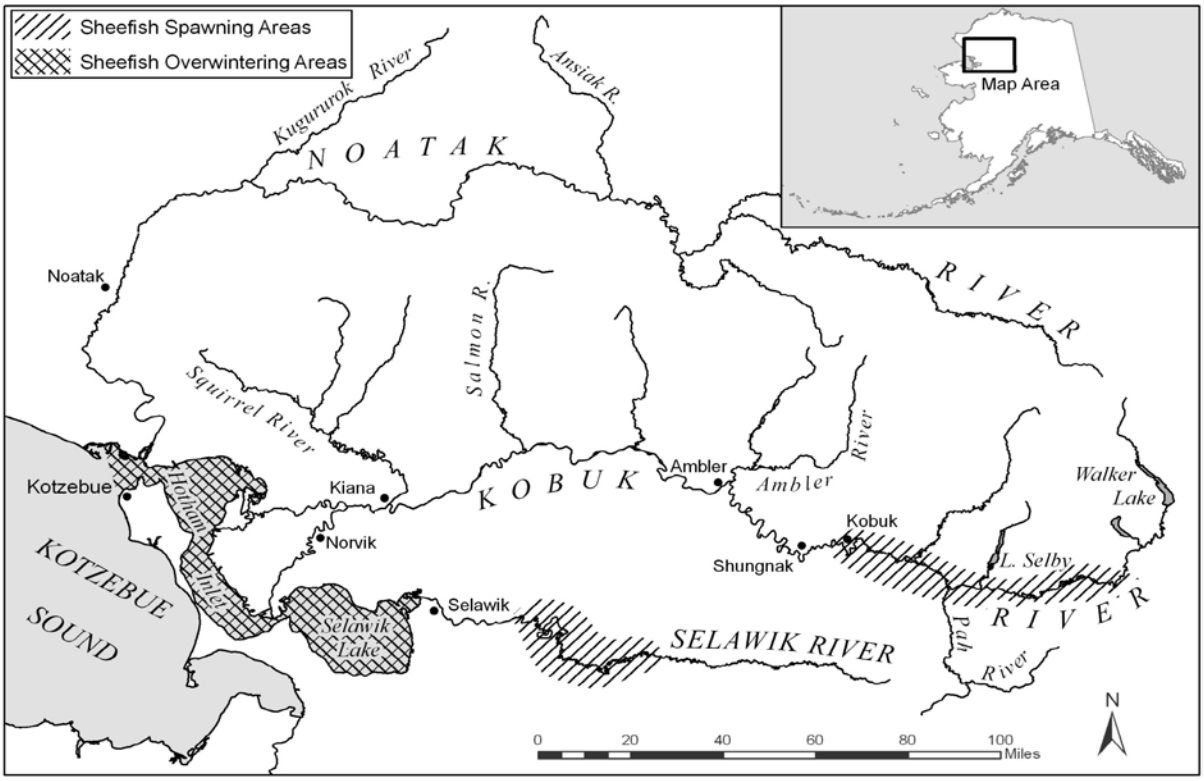


Figure 10.–Kotzebue and Kobuk River Valley villages and their spatial relationship with inconnu spawning and overwintering areas.

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, increases 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). Due to budget constraints The Division of Subsistence stopped doing surveys in 2005, and harvest reports should be regarded as minimum numbers because of limited survey effort during many years. There was a comprehensive subsistence survey for fish and wildlife harvests of the Kobuk River villages and Noatak in 2012, but data are not yet available.

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, 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, 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; however, 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 26,200 lb in 1978 (Appendix F1). More recently, 2 fishermen participated in commercial fishing in 2005 and 2011 (harvest numbers are confidential), and there was no reported commercial sheefish catch from 2006–2010.

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 1 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).

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, 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; 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 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 and 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 out migrating 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 comprising a fishing group. Catch is stored and allowed to freeze in willow cribs located near the seining site. These fish are used throughout the winter by the fishing group. Appendix F5 shows historical subsistence Dolly Varden catches, but they should be considered minimal figures because of survey timing. Most Dolly Varden harvests take place before or just after freeze up. The village of Noatak usually fishes before freeze up, but Kobuk River villages of Shungnak and Noorvik fish for Dolly Varden throughout the winter. Since 1962, catches made by residents of Kivalina ranged from approximately 7,000 to 65,000 Dolly Varden annually, but except for 2007, no harvest surveys have been conducted there since 1986 (Appendix F5).

In Arctic District fishery harvest studies by ADF&G's Division of Subsistence noted 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 non-target 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, 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.

Sport Fishery

Drainages of Kotzebue Sound and the Chukchi Sea are known for the large size of anadromous Dolly Varden; yet, 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 likely due to the remote location and difficult access of fishing sites (Scanlon 2009).

Historical Escapement

Aerial survey counts of overwintering Dolly Varden on the Wulik River ranged from 297,257 fish in 1969 to 1,500 fish in 2003 (Appendix 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 1999, 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 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 delineated harvest levels, open areas, legal gear, etc. Commercial whitefish fisheries were generally limited to large open water areas (e.g. Grantley Harbor in Port Clarence District) or ocean waters. Beach seines were stipulated as legal gear in some instances in order to reduce the number of incidental species taken. Little comparative commercial catch and effort data were recorded, but harvest levels were historically low. Most commercial catches were made in Golovnin Bay in Norton Sound District, in Kuzitrin River in Port Clarence District, and in Hotham Inlet and Selawik River in Kotzebue District. Fish were sold to local markets for human consumption, dog food, or more recently, crab bait. During the 2006–2007 season, 1 local Nome fisherman, who waived confidentiality, sold 3,723 lb of whitefish. No further whitefish harvests occurred until the 2011–2012 season when another Nome fisherman who waived confidentiality harvested over 2,000 lb (fish ticket database).

A commercial fishery for freshwater finfish has existed in the Colville River delta (located approximately 60 miles west of Prudhoe Bay) since 1964 (Appendix H1). 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.

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 since fishermen do not count fish individually, but by "tubs", "bags", "strings" or any other estimators of gross abundance. Additionally, many fish are dried and consumed or stored in caches before the survey period. Reported subsistence harvests were generally the result of a limited and sporadic survey effort and should be regarded as minimum values and not comparable from year to year. In 1997, subsistence harvests of whitefish were included for the first time in Division of Subsistence household salmon harvest surveys in Kotzebue Sound villages (Appendix F8).

The relative importance of whitefish is higher in Kotzebue Sound District than in many areas of the state. Average subsistence harvests of whitefish for the village of Noatak and the 5 Kobuk River villages combined from 1998 to 2002 was 44,552. In 2003, 73,242 whitefish were estimated harvested, and in 2004 there were 50,501 estimated (Georgette et al. 2003a, b, and 2004; Georgette and Shiedt 2005). In 2012 there was a comprehensive subsistence fish harvest survey in the Kobuk River villages and Noatak by the Division of Subsistence, but data are not yet available.

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 had ever occurred, but in the last several years a limited commercial fishery has occurred in Norton Sound. During 1980, 1 fisherman caught and sold 89 lb (98 tomcod) in Nome Subdistrict. In 1983, 1 Nome area fisherman caught and sold 2,548 lb (4,348 tomcod) and in 1989, 1 fisherman sold 1,800 lb locally (fish ticket database). According to local fishermen, these fish were used for dog food, crab bait, and human consumption.

In 1994, 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 in 7 deliveries during January and February of 1994. In 1995, the NSEDC market was not available and was likely a factor in the reduced harvest of 52 lb, which sold for $.50 per lb for a total value of $26.00[3].

No commercial harvest was reported from 1995 through 2008. Saffron cod were harvested from October to December of 2009 by 1 individual (harvest numbers are confidential). Between September 2010 and March 2011, 5 fishermen harvested a total of 8,031 lb and sold them to Norton Sound Seafood Products (NSSP) in Nome for $0.50 per lb. Interest in commercial saffron cod fishing continued during the 2011–2012 winter season, when 7 fishermen sold 3,780 lb to NSSP for $0.50 per lb for use as crab bait for a total value of $1,772 (Menard et al. 2012). NSSP would only buy tom cod 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 are relatively small. Average annual sport fish harvests for Arctic grayling in the last 5 years were under 1,000 fish in Norton Sound and Kotzebue Districts. Despite low harvests, average Arctic grayling sport fish harvests are the second highest non-salmon species in Norton Sound, as well as in Kotzebue Districts (Appendix F3).

SECTION 2: SALMON FISHERIES

2012 NORTON SOUND SALMON FISHERY

2012 Norton Sound Fisheries Outlook

The 2012 outlook was for a commercial harvest level of 70,000–100,000 chum salmon, 300,000–600,000 pink salmon, and 60,000–90,000 coho salmon. Salmon outlooks and harvest projections for the 2012 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 many years, there was buyer interest in large volumes of Norton Sound pink salmon and there was limited commercial interest in Nome Subdistrict (Subdistrict 1) pink and coho salmon. Commercial fishing for chum salmon is closed by regulation in Nome Subdistrict, but brief index periods were expected for pink salmon in late July or early August and coho salmon later in August depending on run strength. Commercial periods for both pink and coho salmon in the Nome Subdistrict 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 and provided 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

Extensive June sea ice, as well as record rainfall and resultant flooding in August made accurate assessments of early run strength of 2012 chum and coho salmon runs unattainable. Large pans of first year thin ice and medium to thick shorefast ice melted in place in southern Norton Sound in 2012 keeping nearshore water temperatures low during early summer. As late as mid-May, shorefast ice thickness reports ranged from 3 to 5 feet from St. Michael Bay to Unalakleet, and several miles of shorefast ice persisted from Stuart Island east to just south of Unalakleet into late June. Many Norton Sound residents commented that the extent, thickness, and duration of sea ice in Norton Sound was exceptional; this most likely delayed the migration timing of most Chinook, pink and chum salmon stocks in Norton Sound, which showed late run timing at escapement projects in 2012. This late salmon run led to difficulties with setting subsistence and commercial fishing schedules, which are based on early projections of salmon run strength. Limited rainfall occurred in June and most of July, which made for good drying conditions during the peak of the chum and pink salmon runs. Very low water levels were reported from most Norton Sound river drainages until late July when the rainy weather arrived. During the month of August, record-setting rainfall and large flood events rendered most Norton Sound salmon assessment projects inoperable for the majority of the coho salmon run. Once again, it was difficult for managers to make reliable projections of escapement at most projects as the bulk of the coho salmon runs were not monitored at escapement projects. Additionally, few acceptable aerial spawning ground surveys were flown in 2012 due to murky water and high water levels.

The 2012 Norton Sound District commercial salmon fishery included the largest pink salmon harvest since 1998 and the seventh best pink salmon harvest in 23 even-numbered year harvests since 1962. Additionally, Norton Bay Subdistrict (Subdistrict 4) had a record pink salmon harvest and a near record coho salmon harvest. Commercial chum salmon harvest was also robust with the eighth highest harvest since 1986 with southern Norton Sound Subdistricts 4–6 accounting for the bulk of this harvest. Coho salmon harvest was below average due to persistent severe weather and high surf conditions curtailing fishing effort throughout the month of August. Anticipated weak runs resulted in no commercial fishing directed at Norton Sound Subdistricts 5 and 6 Chinook salmon for the seventh consecutive season and no directed sockeye salmon fishery in the Port Clarence District for the fourth year in a row.

The number of permit holders (123) participating in the commercial fishery this year matched the number of permit holders in 2011, which was above average and the highest number of participants since 1993 (Appendix A2). The previous 5-year average in Norton Sound was 98 permits fished and the previous 10-year average was 67 permits fished (Appendix A2). The increased fishing effort in the salmon fishery since 2010 is largely the result of strong chum salmon runs, improved market interest, and high dock prices for salmon, particularly coho salmon. Good dock prices for salmon resulted in an exvessel value of $758,908, which was down from 2010–2011 record exvessel values (Appendix A3). However, the 2012 fishery value represents the sixth consecutive season in which salmon fishery value has exceeded $500,000 in Norton Sound (Appendix A3). Average value per permit holder in 2012 was $6,169, which

dropped by 40% from the 2011 average value per permit of $10,323. Dock prices per pound for Norton Sound salmon in 2012 were $0.36, $0.52, $1.45, and $1.47 for pink, chum, sockeye and coho salmon, respectively (Appendix A4). Chinook salmon were not purchased by the buyer in 2012. Average commercial weights by species were 6.6 lb for coho salmon, 2.4 lb for pink salmon, and 6.8 lb for chum salmon. The coho salmon average weight was tied for the record low that also occurred in 1993 and 2006 (Appendix A5).

The 2012 pink salmon harvest was the largest since 1998 and ranked seventh best in 23 even-numbered year harvests since 1962 (Appendix A1). However, the 2012 harvest was well below the 500,000–600,000 pink salmon desired by the industry to satisfy the floating processor vessel. Directed pink salmon periods were limited in 2012 due to a combination of chum salmon conservation concerns, a late start in Subdistricts 2 and 3, competing market interest for chum salmon in Subdistricts 5 and 6, and periodic shortages in tendering capacity. In addition, even though the 2012 pink salmon run was of average run size, similar to 2010, it was much smaller than the well above average runs of 2004, 2006, and 2008. Considering all of these factors, pink salmon harvests could have been considerably higher in 2012, but might have still fallen short of levels desired by the buyer.

Commercial chum salmon harvest in 2012 was 62,772 fish which decreased 43% from the 110,555 chum salmon harvested in 2011 and 47% from the 117,743 chum salmon caught in 2010 (Appendix A1). However, the 2010 and 2011 harvests were the largest in over 25 years and the 2012 harvest is slightly above the recent 5-year average harvest of 61,995 and 88% above the recent 10-year average harvest of 33,446 chum salmon (Appendix A1).

The coho salmon harvest of 37,056 fish was 59% below the recent 5-year average harvest of 90,896 fish and 49% below the recent 10-year average harvest of 73,165 coho salmon (Appendix A1). This can mostly be attributed to weather during the month of August, rather than abundance. 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.

Only 1 salmon buyer operated in Norton Sound during the 2012 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. Some fish from Elim and Norton Bay were also delivered to the fish plant in Nome.

Subsistence Fishery Season Summary

Subsistence salmon fishermen in Port Clarence District and Nome, Golovin, and Elim Subdistricts 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. Permits issued at the Nome office, and by ADF&G personnel in the field, identify gear restrictions, bag limits, subsistence zones (for Nome Subdistrict, 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 1 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. Return rates have been close to 100% in most years and in 2012 for the second year in a row was 100% (Table 2).

Norton Sound District household subsistence surveys were conducted in communities of Saint Michael, Stebbins, Unalakleet, Shaktoolik, and Koyuk, and attempts were made to contact 100% of the households. Catch information for Subdistricts 4–6 are in Appendices A9–A11.

In Norton Sound District, there are limits on subsistence salmon harvests only in Nome Subdistrict where salmon limits have been in place since 1985. Also, hook and line subsistence fishermen must follow sport fish bag limits except in the Nome Subdistrict subsistence zones where they can catch the subsistence limit. In 2012, an average chum salmon run was forecasted for Nome Subdistrict and the subdistrict was not closed to salmon fishing in mid-June for the seventh year in a row. From 1991 through 2005, Nome Subdistrict 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 2012 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.

Regulations allow for cash sales of up to $200 worth of subsistence taken finfish per household, per year, in the Norton Sound-Port Clarence Area only. In 2007, 5 customary trade finfish permits were issued to Nome residents; in 2008 there were 4 permits issued in the Norton Sound. In 2009–2011, only 1 permit was issued per year; to a resident in Teller, Nome, and St. Michael, respectively. In 2012, 2 permits were issued to Nome residents. Sales in most years are confidential because less than 4 permits were issued (Appendix A33).

Season Summary by Subdistrict

Nome-Norton Sound Subdistrict 1

In Nome Subdistrict, 2012 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 2012. 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.

In the Nome Subdistrict, excellent marine subsistence catches of chum salmon were reported in late June and early July but weir counts of chum salmon lagged at the Snake and Nome River weir projects. 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. Additionally, by July 12, the Eldorado River weir-based chum salmon SEG range of 6,200–9,000 was projected to easily be reached. Further, based on this assessment data, management biologists were able to project that the subdistrict-wide BEG would be achieved. Consequently, chum salmon subsistence gillnet fishing proceeded on the standard freshwater and marine schedules for the remainder of the season. 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.

In contrast to Subdistricts 2–6, Nome Subdistrict salmon production comes from several relatively small coastal streams contributing to the overall run. These small, shallow drainages are undoubtedly more sensitive to variability in environmental conditions (e.g., fall floods, cold

temperatures, low water levels, etc.). Furthermore, variability in chum salmon production tends to be higher in the smaller Nome Subdistrict rivers (e.g., Nome and Snake rivers), whereas runs to the eastern Nome Subdistrict rivers tend to be relatively stable. This was once again the case in 2012 as eastern Nome Subdistrict drainages accounted for 74% of the overall Nome Subdistrict chum salmon escapement in 2012 (Table 3). 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 met or exceeded the chum salmon escapement goal range in 4 years, but the Nome and Snake rivers have failed to meet the low end of their escapement goal ranges in 3 years (Appendix A21). In Nome Subdistrict although chum salmon runs are greater east of Cape Nome (Appendix A31), for pink salmon the run strength is much greater west of Cape Nome (Appendix A32). 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.

Accurate assessment of coho salmon escapement in the Nome Subdistrict was not possible in 2012 after mid-August because of flooding events producing high and turbid water. This rendered all counting operations inoperable while causing unfavorable aerial survey conditions.

In 2012 there were 483 permits issued, slightly above the 448 permits issued last year and just below the record 494 permits issued during the 2010 season. All 483 permits issued were returned (Table 2).

Reported subsistence harvest was 11 Chinook, 2,521 chum, 8,376 pink, 1,150 coho, and 171 sockeye salmon (Appendix A6). The chum salmon harvest was the third highest in the 2000s, but was somewhat less than expected because of the large abundance of chum salmon available for harvest particularly east of Cape Nome. Weather was thought to be a factor resulting in less fishing time for nets in the ocean. The pink salmon harvest was the fourth highest in an odd-numbered year in the 2000s. Although the coho salmon harvest was below the 5- and 10-year harvest averages, the 2012 harvest was the ninth consecutive year the harvest exceeded 1,000 fish compared to the 5 years previously (1999–2003) when the harvests were below 1,000 fish.

Golovin-Norton Sound Subdistrict 2

The Golovin Subdistrict 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 is used to evaluate escapement in the Golovin Subdistrict; the lower bound SEG for chum salmon on this river is greater than 23,000 fish. 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 between 2001 and 2008, largely because escapements had fallen short of the lower bound SEG of greater than 30,000 fish for the Niukluk River. Consequently, ADF&G has implemented a conservative approach with

respect to determining when commercial fishing may occur. Early indicators of 2012 chum salmon abundance to Golovin Subdistrict were limited to scant subsistence catch reports of fair catches. However, escapement of chum salmon in Subdistrict 2 based on mid-July Niukluk River tower counts was well below average with projected escapement estimates near or just below the revised SEG threshold of greater than 23,000 chum salmon. Directed chum salmon fishing was limited to one 36-hour period in Golovin Subdistrict on July 26 after it was projected that the Niukluk River SEG threshold would be narrowly exceeded.

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 Subdistricts 2 and 3 management plan. On July 14, commercial pink salmon fishing commenced in Golovin Subdistrict with a 24-hour opening. There were 3 pink salmon openings between July 14 and 18 and CPUE ranged from 9 index points on July 18 to 56 index points on July 14. Catch rates were above historical averages for the second week of July in Golovin, with the largest catches occurring during the July 18 opening (16,871 pink salmon). By the third week of July, the proportion of water-marked pink salmon increased to more than 50% of the catch which led to a lack of buyer interest at the conclusion of the July 19 opening. Despite a late start in northern Norton Sound in 2012, there were 31,055 pink salmon harvested in Golovin Subdistrict. Pink salmon harvest ranked eighth highest since 1962 (Appendix A7).

As a consequence of the severe weather, reliable estimates of coho salmon escapement could not be obtained at any project in 2012. However, projections of escapement made after the historical quarter point at the Niukluk River suggested that the SEG range would have been achieved. From August 12 to September 1, there were 4 directed coho salmon fishing periods established in Golovin Subdistrict ranging from 36 hours to 72 hours in length, but there was very little effort due to recurrent storms and high surf conditions keeping fishermen on the beach.

The commercial catch in Golovin Subdistrict for 2012 including personal use was 2 Chinook, 14 sockeye, 573 coho, 31,055 pink and 3,791 chum salmon caught by 14 permit holders (Table 4). The pink salmon catch and the number of permit holders participating in the fishery were the highest since 1998.

This was the ninth year that subsistence salmon permits were required and 151 permits were issued for Golovin Subdistrict in 2012. Reported harvest was 57 Chinook, 1,056 chum, 7,635 pink, 1,143 coho, and 52 sockeye salmon (Appendix A7). The number of salmon reported harvested (9,943) ranked fifth lowest in the 2000s, and ranked last for even-numbered years in the same time period (Appendix A7). Even-numbered years usually have a higher harvest because of the larger run of pink salmon in those years. The Niukluk River escapement was 21 Chinook, 1,729 coho, 249,212 pink and 19,576 chum salmon (Table 3). The chum salmon escapement at Niukluk River was the fourth lowest in the 2000s and the coho salmon escapement was second lowest in the 2000s (Appendix A25). However, chum salmon escapement should be considered a minimum count because the project was inoperable for 9 days due to multiple flood events. The lower coho salmon escapement numbers can be attributed to the weather; storm and flood conditions that led to poor counting conditions and minimum counts through much of the coho salmon run, and also to the comparatively early seasonal end date of the Niukluk River counting operations.

Elim-Norton Sound Subdistrict 3

The Elim Subdistrict 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 escapements or subsistence needs.

Early indicators of chum salmon abundance to Elim Subdistrict were limited to scant subsistence catch reports of fair catches in the 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. No directed chum salmon commercial fishing periods occurred, but a total of 2,262 chum salmon were harvested incidentally in directed pink and coho salmon fisheries (Table 5).

On July 7, commercial pink salmon fishing began in the Elim Subdistrict with 4 directed openings between July 7 and July 19. CPUE ranged from 16 (July 19) to 64 on July 14 during the 4 openings from July 7 to 19. Catch rates were above historical averages for the second week of July in Elim, with the largest catches occurring during the July 19 opening (24,798 pink salmon). By the third week of July, however, the proportion of water-marked pink salmon increased to more than 50% of the catch which led to a lack of buyer interest at the conclusion of the July 19 opening. Despite a late start in northern Norton Sound in 2012, there were 52,775 pink salmon harvested in the Elim Subdistrict, which ranked third historically only behind the 1996 (68,609 pink salmon) and 1998 harvests (145,669 pink salmon) (Appendix A8). The 2012 Elim Subdistrict pink salmon run would have easily supported a much greater harvest had there not been chum salmon conservation concerns and had there been more tendering capacity.

Precipitation in late July led to flood events that knocked out most Norton Sound escapement projects for several days, including the Kwiniuk River tower in the Elim Subdistrict. However, Kwiniuk River remained operational in early August as this watershed did not initially receive as much precipitation as other areas. By August 11, a record low 500 coho salmon had been counted at the Kwiniuk River tower, but normal run timing projections resulted in a conservative projected escapement estimate of 1,700 coho salmon and indicated the aerial survey SEG range of 650–1,300 coho salmon would most likely be achieved. Additionally, over 2,900 coho salmon were observed during the aerial survey at the neighboring Tubutulik River from the mouth to Clear Creek. The mid-August Tubutulik River aerial count was higher than previous years surveys conducted during peak spawning stage. A gravel/sand obstruction to the Kwiniuk River slough at Moses Point inlet was also observed during the mid-August survey. It is possible that this obstruction may have altered the relative distribution of all salmon, including coho salmon in the Kwiniuk and Tubutulik River drainages in 2012, which may explain the unexpected large number of coho salmon observed in the Tubutulik River. Based on the survey data, ADF&G projected that inriver abundance of coho salmon in Elim Subdistrict drainages was sufficient to provide for escapement and subsistence uses of coho salmon. As a result, from August 12–31 there were 5 periods in Elim Subdistrict ranging from 36 hours to 72 hours in length; a total of 2,003 coho salmon were harvested by 24 permit holders (Table 5). This catch ranks 14 out of 30 years of commercial coho salmon harvests (Appendix A8). However, as in other areas, fishing effort was adversely impacted by recurrent storms and high surf conditions.

The commercial catch in Elim Subdistrict including personal use was 3 Chinook, 1 sockeye, 2,003 coho, 52,775 pink and 2,262 chum salmon caught by 24 permit holders (Table 5). The 2012 Elim pink salmon harvest ranks third best historically and is 130% above the even-year average harvest of 22,945 pink salmon.

There were 63 subsistence salmon permits issued for Elim Subdistrict in 2012 and all 63 permits were returned. The number of salmon reported harvested (13,686) was the third highest since harvest estimation methods were standardized in 1994. Estimated subsistence harvests by species were 42 Chinook salmon, 1,302 coho salmon, 10,848 pink salmon, and 1,494 chum salmon. Chinook salmon harvest was a record low whereas the pink salmon harvest established a new record high. Coho salmon harvest ranked 13 out of 19 years of harvest estimates and chum salmon harvest ranked 9 out of 19 years of reliable subsistence harvest estimates (Appendix A8).

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 become 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 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. The 2012 commercial fishery began with two 48-hour pink salmon openings on July 3 and July 8. These periods provided record-setting pink salmon harvests, leading to the addition of 2 additional pink salmon periods (a 12-hour and a 24-hour period) to provide additional opportunity to utilize pink salmon commercial harvest surpluses. The 49,970 pink salmon harvested in 2012 was 183% above the previous record harvest of 17,676 pink salmon set in 1963 (Appendix A9).

There were no directed chum salmon openings until July 19 because Norton Sound Seafood Products (NSSP) directed fishermen to target pink salmon because of good catch rates of pink salmon. There were 4 chum salmon periods ranging from 36 to 48 hours between the dates of July 19 and July 29. One 48-hour chum salmon period (on July 26) was not fished due to inclement weather. From July 19 to July 31, there were two 36-hour and two 48-hour periods directed at chum salmon in Norton Bay Subdistrict before ADF&G switched to coho salmon management on August 1. Chum salmon harvest in Norton Bay Subdistrict (8,417 fish) ranked ninth best in 29 years of commercial fishing and was 111% above the recent 4-year average (Appendix A9).

The coho salmon season began on August 1 in Norton Bay Subdistrict with a 48-hour period. There were three 48-hour periods between August 1 and August 8, and then a 72-hour opener on August 11 to utilize coho salmon surpluses. Norton Bay Subdistrict was placed on a schedule of two 48-hour periods per week for the remainder of the season effective August 15 because of above average catches of coho salmon from August 5 to August 11. Coho salmon commercial fishing was precluded by high surf conditions from August 15–22. The commercial fishery closed by regulation on September 7. Only the first 4 (from August 1 to August 14) of the total 11 directed coho salmon periods were fished with reasonable effort. Despite this, Norton Bay Subdistrict had its second highest harvest on record with 4,378 coho salmon (Appendix A9).

Table 6 shows commercial salmon harvest and effort by period for the 2012 season. Cumulative commercial catch by species for Norton Bay Subdistrict including personal use was 10 Chinook, 16 sockeye, 4,378 coho, 49,970 pink, and 8,417 chum salmon. The chum salmon harvest was the highest since 1985 and the coho salmon harvest was just shy of last year's record (Appendix A9). The final escapement counts at Inglutalik River tower were 1,134 Chinook, 32,832 chum, 90,349 pink, and 1,431 coho salmon (Appendix A28). The coho salmon count was a minimum estimate because high water precluded counting the entire run.

This was the fifth 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 77 households that were successfully contacted out of a possible 78 in 2012. Results from these households were expanded to estimate harvests by species, gear type, and location (e.g., Inglutalik River, Ungalik River, Koyuk River, Mukluktulik River, and marine waters) for those households not surveyed (Appendix A9).

An estimated 103 Chinook, 2,721 chum, 2,623 pink, and 310 coho salmon were reported as subsistence harvest in Norton Bay Subdistrict in 2012. The total of 5,757 salmon harvested was the second lowest reported since surveys started in 1994. However, the combined commercial and subsistence harvest of 68,548 salmon was the largest on record (Appendix A9).

Shaktoolik and Unalakleet-Norton Sound Subdistricts 5 and 6

Both Shaktoolik and Unalakleet Subdistricts, which share a common boundary, consistently attract commercial markets due to larger volumes of fish and better transportation services. Management actions typically encompass both subdistricts because salmon tend to intermingle, and harvest in 1 subdistrict affects the movement of fish in the adjacent subdistrict. ADF&G's test net in Unalakleet River, North River counting tower, and subsistence fishermen interviews in Unalakleet are used to set early fishing periods in both subdistricts. Both the Unalakleet River test net project (Kent 2010) and North River tower project (Jones 2006) have been used to assess run strength along with commercial and subsistence catches. 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 and 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.

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, the department is directed to close the Chinook salmon fishery.

In Shaktoolik and Unalakleet Subdistricts, 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 2012. As forecasted, a weak run of Chinook salmon to Shaktoolik and Unalakleet Subdistricts 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 5 per the Shaktoolik and Unalakleet Subdistricts management plan.

For the first time since 1998, there was a pink salmon directed commercial fishery with gillnet gear restricted to 4.5 in or smaller mesh size in Shaktoolik and Unalakleet Subdistricts. This began on July 3 with a 12-hour opening. Catch per unit effort ranged from 44 (Unalakleet) to 48 (Shaktoolik) during these openings, which was well above historical average CPUE. Good catch rates of pink salmon continued in southern Norton Sound until catches peaked around July 10. The last pink salmon fishing period for the season in Shaktoolik was on July 10, and on July 12 in Unalakleet. Southern Norton Sound subdistricts accounted for the majority (59%) of the overall pink salmon harvest in Norton Sound. Shaktoolik (19,253 pink salmon) and Unalakleet Subdistrict (52,445 pink salmon) harvests were below their respective long-term average even-numbered year harvests, but ranked 6 and 8 out of 23 even-numbered year harvests, respectively (Appendices A10 and A11).

The cool spring led to late runs of chum salmon in southern Norton Sound, which made ascertaining early run strength difficult. However, it was apparent by early July that southern Norton Sound chum salmon runs were exhibiting good run strength. Good subsistence catches of chum salmon were reported in Norton Bay, Shaktoolik, and Unalakleet Subdistricts and chum salmon escapements were incrementally building by the first week of July as indexed by Inglutalik River tower and Unalakleet River weir counts. In 2012, directed chum salmon periods were limited to 24 hours in both Shaktoolik and Unalakleet Subdistricts until July 14 due to Chinook salmon conservation concerns. Additionally, the northern half of Unalakleet Subdistrict was not opened to commercial chum salmon fishing until July 14 in order to minimize the incidental harvest of Chinook salmon as they migrated through the subdistrict. On July 18, Shaktoolik and Unalakleet Subdistricts were placed on a schedule of two 48-hour periods per week until July 31. The July 18 opening of 48 hours was eventually extended to 72 hours because of high surf conditions severely limiting fishing effort. As expected, southern Norton Sound Subdistricts (Norton Bay, Shaktoolik, and Unalakleet) accounted for a majority (91%) of the chum salmon harvest in 2012.

Unlike northern Norton Sound, decent early projections of coho salmon escapement to southern Norton Sound could be made based on North River tower passage. By August 1, projected escapement at North River tower was between 4,100 and 7,400 coho salmon based on normal to

late run timing models. Fishery managers set individual periods of 48–72 hours in duration for Norton Bay, Shaktoolik, and Unalakleet Subdistricts through August 6, but were not willing to commit to a commercial schedule until more certain projections of escapement could be made.

By August 7, projected escapement of coho salmon to North River was 6,000 fish, which suggested that the North River aerial survey SEG range of 550–1,100 coho salmon would easily be achieved. Additionally, projected Unalakleet River drainagewide escapement based on North River tower counts and historical radiotelemetry data improved to 40,000–75,000 coho salmon. This level of inriver abundance was more than sufficient to provide for escapement and subsistence harvests. Considering the improved projections, effective August 12, Shaktoolik and Unalakleet Subdistricts were placed on a schedule of two 48-hour periods per week for the remainder of the season. Norton Bay Subdistrict was also placed on this schedule effective August 15 because of above average catches of coho salmon from August 5 to August 11. The commercial fishery closed by regulation on September 7. Harvests in Shaktoolik and Unalakleet Subdistricts were below their respective recent 5-year and long-term (1979–2011) average harvests.

The decrease in commercial coho salmon harvests in 2012 can mostly be attributed to weather during the month of August, rather than abundance. Shaktoolik Subdistrict, a major contributor to coho salmon harvests, was hit especially hard by southerly storms and fishing was not possible for 3 periods between July 25 and August 19. 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 few brief fishable weather windows in August made it extremely difficult for the buyer to plan logistics for buying operations in remote subdistricts.

Commercial harvests for 2012 in the Shaktoolik Subdistrict including personal use were 25 Chinook salmon, 29 sockeye salmon, 20,141 chum salmon, 19,253 pink salmon, and 7,828 coho salmon harvested by 21 permit holders (Table 7). In the Unalakleet Subdistrict, the 2012 commercial harvest including personal use by 55 permit holders was 157 Chinook salmon, 74 sockeye salmon, 52,445 pink salmon, 28,161 chum salmon, and 22,274 coho salmon (Table 8). Shaktoolik (19,253 pink salmon) and Unalakleet Subdistrict (52,445 pink salmon) harvests were below their respective long-term average even-numbered year harvests, but ranked 6 and 8 of 23 even-numbered year harvests, respectively. Shaktoolik (20,141 fish) and Unalakleet (28,161 fish) Subdistricts chum salmon harvests were above their respective historical average harvests and were in the top 20 harvests in over 50 years of fishing (Appendices A10 and A11). Shaktoolik and Unalakleet coho salmon harvests, on the other hand, were below their respective recent 5-year and long-term (1979–2011) average harvests. Coho salmon harvest ranked twentieth best in Shaktoolik and twenty-sixth best in Unalakleet. Harvest of coho salmon was well below (64%) the recent 5-year average harvest, and nearly even with the long-term in Shaktoolik (Appendix A10). In Unalakleet, harvest of coho salmon was 61% below the recent 5-year average harvest, and 18% below the long-term average harvest (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 2012. Appendices A21–A30 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, Kwiniuk and Niukluk rivers, a sonar on Shaktoolik River, and weirs on Unalakleet, Snake, Eldorado and Pilgrim rivers, and in Glacial Creek which flows from Glacial Lake into Sinuk River. A test net on Unalakleet River provides run assessment information (Kent et al. 2008; Kent 2010).

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; as a result, there were very few aerial surveys flown.

Chinook Salmon

Chinook salmon escapement was estimated to be weak in many locations in 2012. A record low 54 Chinook salmon were counted at the Kwiniuk River tower which was 82% below the lower end of the SEG range (300–550; Appendix A24). However, local residents expressed concern to ADF&G that escapements were affected by a large sand/gravel berm that entirely obstructed the slough connecting Kwiniuk Inlet to Moses Point Inlet. This berm gradually encroached on the channel beginning with the 2005 fall storm. Apparently, the huge November storm in 2011 completely blocked off this channel, although it was not actually observed by ADF&G until a mid-August coho salmon aerial survey in 2012. In late August, NSEDC biologists documented that the berm had been washed away from the persistent rainy weather and flooding of the Kwiniuk River. To the east in Norton Bay, an estimated 1,134 Chinook salmon were enumerated at the Inglutalik River tower, down from the 1,467 Chinook salmon counted during the 2011 season (Appendix A28).

Escapement of Chinook salmon at the North River tower for the 2012 season was 996 Chinook salmon, the third lowest complete count on record. North River Chinook salmon escapement has fallen short of the SEG range in 7 of 14 seasons since the goal was established (Appendix A29). Final escapement at the Unalakleet River weir was 766 Chinook salmon, which was well below the 1,021 and 1,111 Chinook salmon enumerated during the 2010 and 2011 seasons, respectively. As forecasted, the majority of Chinook salmon that returned in 2012 was age-5 fish from the 2007 brood year. However, the diminished productivity from this brood year was unexpected, and evidently, a decline even from the poor production observed in the 2005–2006 brood years. Chinook salmon escapement to Shaktoolik Subdistrict has not been monitored intensively due to a lack of ground-based escapement projects. However, the Shaktoolik River sonar project operated by NSEDC provided weekly apportioned sonar passage estimates by species to ADF&G for the first time since operations began several years ago. Shaktoolik River estimated escapement of Chinook salmon from apportioned sonar counts was 1,082 fish in 2012 (Appendix A30).

Chum Salmon

Chum salmon escapement goals in most chum salmon producing drainages of northern Norton Sound were not achieved in 2012. However, the 2012 Niukluk River escapement of 19,576 chum salmon should be considered a minimum count because the project was inoperable for 9 days due to multiple flood events. To the east in Subdistrict 3, the 2012 Kwiniuk River chum salmon

escapement (5,577) was a record low for the tower project (Appendix A24). However, the blockage to the channel connecting Moses Point to Kwiniuk Inlet could have prevented Kwiniuk River chum salmon from reaching their natal spawning grounds. Unfortunately, the Tubutulik River could not be surveyed to assess relative abundance of chum salmon escapement in this drainage because of poor viewing conditions during the peak chum salmon spawning stage.

As in 2010 and 2011, acceptable aerial surveys were not flown in 2012 to evaluate the Old Woman/Upper Unalakleet River aerial survey SEG range (2,400–4,800 chum salmon) due to flood conditions and inclement weather. However, it is likely the goal would have been reached based on ground-based escapement counts of chum salmon in the Unalakleet River drainage; there were 70,669 chum salmon counted at Unalakleet River weir and the observed chum salmon passage at North River counting tower was 9,120 chum salmon (Appendix A29). The 2012 weir count was down 35% from the 2011 count of 108,770 chum salmon but similar to the 70,811 chum salmon enumerated in 2010 (Appendix A30). In the Shaktoolik River, estimated escapement of chum salmon based on apportioned sonar counts was 43,865 fish. In Norton Bay, chum salmon escapement as indexed by the Inglutalik River tower was an estimated 32,832 chum salmon which was down approximately half from the 64,892 chum salmon enumerated during the project's inaugural season in 2011.

Coho Salmon

Coho salmon are found in nearly all of the chum salmon producing streams throughout Norton Sound with the primary commercial contributors being the Unalakleet and Shaktoolik rivers. Because inclement weather is normally experienced in this area during August and September, escapement data can be somewhat incomplete. 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.

As a consequence of the severe weather, reliable estimates of coho salmon escapement could not be obtained at any project in 2012. However, solid projections of escapement made after the historical quarter passage points at the North, Kwiniuk, and Niukluk rivers suggested that aerial survey SEG ranges for those systems would have been achieved. A second major and more severe high water event in mid-August effectively shut down all Norton Sound escapement counting projects for the remainder of the season. In fact, the Kwiniuk River tower camp had to be evacuated a full 3 weeks earlier than normal due to coastal flooding in camp, which made staying there unsafe. Additionally, flooding damaged ADF&G's test net in the lower Unalakleet River and project was inoperable for several days, for the first time since 1994.

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 9 rivers with ground-based escapement projects in 2012.

Pink salmon escapements in 2012 were all well below long-term even-numbered year average escapements (Table 3 and Appendices A19 and A32). However, all Norton Sound pink salmon escapement goals were easily achieved in 2012 and surpluses were more than sufficient to

support subsistence needs and commercial harvests. There is no context for comparison regarding the 2012 Shaktoolik and Inglutalik River pink salmon counts as this is first year with counts at Shaktoolik River sonar and only the second year of counts at Inglutalik River tower. However, it is noteworthy that the 2012 pink salmon count at Inglutalik River was less than one-fifth of the 2011 season count of 494,099 pink salmon (Appendix A28). In contrast, the Unalakleet River weir pink salmon passage in 2012 was 85% above the 2011 count of 363,906 pink salmon, but 20% below the 2010 count of 832,904 pink salmon (Appendix A30).

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 sockeye salmon in North America of any significance. Salmon Lake spawning populations seldom exceeded 10,000 fish in years previous to 2003, whereas from 2003–2007 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 A27).

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. The 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 A27). 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. Aerial surveys of Glacial Lake were not conducted in 2012 due to poor weather conditions. The combined aerial survey count for Salmon Lake and Grand Central River was 5,830 sockeye salmon, within the escapement goal range of 4,000 to 8,000 (Table 3).

Enforcement

Two AWT officers patrolled the Norton Sound District 2012 commercial salmon fisheries in Unalakleet and 1 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.

2013 NORTON SOUND SALMON OUTLOOK

Salmon outlooks and harvest projections for the 2013 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 weak and similar to the 2012 run with no commercial fishing targeting Chinook salmon expected. Additional preemptive subsistence restrictions are also probable for southern Norton Sound in order to conserve Chinook salmon to reach escapement goals. These restrictions include reductions in fishing time in the marine waters, inriver closures to gillnets with a mesh size greater than 4.5 in, and 6 in or less mesh size restrictions in the 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 to above average in southern Norton Sound Subdistricts (Norton Bay, Shaktoolik, and Unalakleet) based on the recent 5-year trend of 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 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 2013, 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 Golovin and Elim Subdistricts. 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 40,000–70,000 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 odd-numbered year, and dependent on buyer interest the harvest could be 50,000–100,000 fish. No subsistence fishing restrictions for pink salmon are expected.

The coho salmon run in 2013 is expected to be below average to average based on recent 5-year trends in abundance and ocean conditions, as well as parent year escapements and freshwater rearing conditions for the 2009 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 2013 are expected to range from average (Shaktoolik and Unalakleet Subdistricts) to above average (Norton Bay Subdistrict) based on favorable freshwater rearing conditions. Considering these factors collectively, the commercial harvest is expected to range from 30,000 to 60,000 coho salmon. Weather could be a big factor limiting commercial harvests as was the case in 2011 and 2012 when high surf conditions kept fishermen on the beach during the peak of the run in many areas. Coho salmon subsistence fishing restrictions are not expected.

2012 PORT CLARENCE SALMON FISHERY

Commercial Fishery Season Summary

Glacial Lake, in the northwestern portion of the Nome Subdistrict, and Salmon Lake which empties into the Pilgrim River in the Port Clarence District, support 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 as it is more easily traveled and several beach seining and set gillnet fishing locations are accessible via the Kougarok Road emanating from Nome. In addition, Pilgrim River sockeye salmon are harvested in mixed stock marine gillnet fisheries in proximity to the villages of Brevig Mission and Teller in Port Clarence.

In 1966, a commercial salmon fishery was established in the Grantley Harbor/Tuksuk Channel area of the Port Clarence District. It was closed later that same season due to small salmon runs and concerns from local residents about impacts to area subsistence salmon fisheries. In 2007, the BOF re-established 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.

No commercial salmon fishing was allowed in 2012. ADF&G had projected that the sockeye salmon run for Pilgrim River in 2012 would not reach the inriver goal of 30,000 sockeye salmon that is necessary for a commercial fishery to occur. Weak subsistence catches and counts at Pilgrim River weir confirmed that the 2012 run was not sufficient to allow for commercial salmon fishing.

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 2012 there were 188 permits issued, up from 2011 when 133 permits were issued but well below 2008 when a record number of permits were issued (255) (Menard et al. 2012). Pilgrim River estimated subsistence harvests by species were 6 Chinook salmon, 5 coho salmon, 27 pink salmon, 651 sockeye salmon, and 219 chum salmon (Table 2).

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. 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 had been required in the Pilgrim River drainage for over 40 years, 2012 was only the ninth 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 147 permits, similar to the 137 permits issued the previous year. Salmon Lake remained closed to all salmon fishing in 2012 (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 showed an increasing trend of sockeye salmon returns to Salmon Lake since 1986 (Appendix B1). However, the sockeye salmon run crashed beginning in 2009. 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 5,830 sockeye salmon was higher than the 2011 count of 5,144, and was the second time in a row the escapement goal had been reached since 2008. 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). In 2008, Pilgrim River weir passage took a downturn with 20,452 sockeye salmon counted, and crashed the following years with only 953 and 1,654 sockeye salmon counted through the weir in 2009 and 2010. There was improvement in 2011 with a count of 8,449 sockeye salmon. This year's count of 7,085 sockeye salmon is slightly less than last year but still an improvement from 2009 and 2010 (Appendix B2).

Enforcement

In 2012, 1 AWT officer patrolled Pilgrim River in Port Clarence District.

2013 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 2013. However, based on escapement and smolt data the sockeye salmon run is expected to continue to improve since the last 3 years and subsistence fishing restrictions may not be needed in 2012 or will occur in mid-July, or later, if necessary. Chum and pink salmon are expected to have sufficient runs allowing for subsistence fishing.

ADF&G will compare the 2013 run with sockeye salmon escapement counts at the weir from the last few years and determine if any subsistence fishing restrictions are needed.

2012 KOTZEBUE SOUND SALMON FISHERY

Commercial Fishery Season Summary

The Kotzebue Sound commercial salmon fishery opened on July 10 and closed after the August 31 fishing period. However, the last fishing period where fishermen participated was August 30 (Table 9). Similar to last year, there was a very strong run of chum salmon, but commercial fishing was limited, particularly in August, because of buyer capacity concerns and extreme weather conditions.

During most of July there was sufficient buyer capacity for the fleet to fish 6 days a week, but there were some closures because of runway work preventing cargo planes being able to land at Kotzebue airport. During the second half of the first week of August fishing was reduced to 3 to 4 hours from the usual 8 hours in length because of buyer capacity concerns. During the last half of August daily fishing periods were extended to 6 hours, but fishing effort dropped off because of poor weather.

There were 83 permit holders who sold fish to the major buyer, Great Pacific Seafoods, including 1 catcher-seller who sold fish to Great Pacific as well as to a second buyer Sun'aq Tribal Enterprises, Inc. and also to Kotzebue area residents. The 83 permit holders were the second most to fish in Kotzebue since 1995 and were slightly behind last year's 89 permit holders that fished (Appendix C1). The price per pound for chum salmon dropped from $0.40/lb last year to $0.32/lb and may have been a factor in the number of permit holders fishing this season.

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 composition (ASL) 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 2012, commercial catch samples were 2% age-0.2 fish, 70% age-0.3 fish, and 24% age-0.4 fish and 4% age-0.5 fish. Historical comparisons had the catch samples falling within the range of previous years (http://www.adfg.alaska.gov/CommFishR3/WebSite/AYKDBMSWebsite/Default.aspx).

The overall chum salmon run to Kotzebue Sound in 2012 was estimated to be above average to well above average based on the commercial harvest rates, subsistence fishermen reporting good catches, and the Kobuk test fish index being the third highest in the 20 year project history. No aerial surveys were flown in the Kobuk and Noatak River drainages, because of high and turbid water. The commercial harvest of 227,965 chum salmon was the fourth highest in 20 years (Appendix C1). Also, harvested during the commercial fishery and kept for personal use were 7 Chinook salmon, 6 sockeye salmon, 445 pink salmon, 18 coho salmon, 300 Dolly Varden, 1,867 sheefish, 27 whitefish, 1 tom cod and 2 pike (Table 9). There were likely some additional fish kept for personal use that did not get reported on fish tickets.

A total of 1,751,473 lb of chum salmon (average weight 7.7 lb) were sold at an average of $0.32 per lb (Appendices C2 and C3). The total exvessel value was $567,664 to Kotzebue Sound fishermen. The average value for each participating permit holder was $6,839. The total exvessel value represents 96% of the $592,450 historical average (Appendix C4).

Subsistence Fishery Season Summary

Subsistence household salmon surveys were regularly conducted in Kotzebue District from 1962 to 2004 by the Division of Subsistence, but since 2004, no subsistence surveys have been conducted in the area (Appendices C5–C7). In 2012, there was a comprehensive subsistence fish harvest survey in Kobuk River villages and in Noatak, but data are not yet available. No other information on subsistence harvest is available other than comments that chum salmon fishing on Kobuk and Noatak rivers was good.

Escapement

This year's test fishing chum salmon CPUE cumulative index at ADF&G test fish project on Kobuk River near Kiana was 2,398 points and ranked third out of 20 years at the Kobuk River test fish project (Table 10). Likely the project would have finished with the highest CPUE, but test fishing operations were suspended a week early because of high water and uprooted trees and other debris floating down the river making test fishing impossible. The Kobuk River test net catch samples were (< 1%) age-0.2 fish, 62% age-0.3 fish, 34% age-0.4 fish and 3% age-0.5 fish. Historical comparisons had 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.

Enforcement

One AWT officer patrolled the Kotzebue Sound District 2012 commercial salmon fishery.

2013 Kotzebue Salmon Outlook

The outlook for the 2013 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 2012. During the 2013 season, the 4-year-old component of the run is expected to be 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. The commercial harvest is expected to fall within the range of 225,000 to 250,000 chum salmon, if market conditions can accept that level of harvest (Data on file with ADF&G, Division of Commercial Fisheries; Nome).

SECTION 3: PACIFIC HERRING FISHERIES

2012 NORTON SOUND PACIFIC HERRING FISHERY

Sac Roe

In contrast with the 2 years preceding, there was no Norton Sound herring sac roe fishery in 2012. This was due to the vast extent of sea ice remaining in the area during the herring fishing season. Subsistence users from Shaktoolik to Stebbins were also severely impacted by the ice conditions in 2012, as shorefast ice also limited opportunities to harvest herring roe on wild kelp. Historical information for the Norton Sound commercial sac roe fishery can be found in Appendix D3. Other historical fisheries information is presented in Appendices D1, D2, and D4.

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 2012.

Bait Fishery

Lingering sea ice made a directed bait herring fishery nearly impossible in the Norton Sound district in 2012. NSEDC purchased a total of 6.8 tons of bait herring from 8 permit holders for a total exvessel fishery value of $4,106.70 (Table 11). This harvest occurred between June 16 and June 25. Harvest levels would have been higher as there was market interest, but it was unsafe or impossible to navigate vessels through the sheets of sea ice that were unseasonably late in melting/receding in 2012.

Commercial Fishery Management

ADF&G projection for the 2012 herring spawning biomass for Norton Sound was 52,949 tons. At 20% exploitation rate, the guideline harvest level (GHL) for the Norton Sound District fishery was 10,590 tons with 10,270 tons allocated to the sac roe fishery. NSEDC was successful at developing a market for 1,000 tons of sac roe herring in 2012, but ice conditions thwarted harvest efforts (Table 12).

An ADF&G field crew was deployed to Cape Denbigh to conduct test fishing operations in 2012 for the first year since 2009. They arrived at Cape Denbigh on June 6, intending to survey for herring. Ice conditions kept them in camp until June 8. On June 8 they were able to perform 3 sets, during which no herring were caught. On June 11 they observed herring near Point Dexter. The variable mesh gillnet (VMG) was set and caught 658 herring, 60 of which were sampled. For the next 2 days, ice impaired the field crew's ability to do any research. On June 14 the decision was made to abort the mission due to an encroaching ice sheet (Data on file with ADF&G, Division of Commercial Fisheries; Nome).

Catch Reporting and Enforcement

No AWT officers were on Norton Sound herring grounds during the 2012 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 observing and accurately estimating herring biomass impossible (Table 13).

2013 NORTON SOUND PACIFIC HERRING OUTLOOK

The 2013 projected biomass for Norton Sound District is 58,594 tons. A 20% exploitation rate would result in a GHL of 11,719 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 11,399 tons for sac roe harvest. The beach seine harvest is allocated 10% of the sac roe projected harvest, or 1,140 tons. The 2013 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 6–7 are expected to comprise 68% of the returning biomass (Appendix D15). Herring age 8 and older are expected to comprise 28% of the biomass. If there are more favorable ice conditions in 2013 ADF&G expects to conduct a more comprehensive test fishery and a commercial sampling program is anticipated for the 2013 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 legal male crab abundance for the 2012 summer commercial crab fishery at 3.74 million lb (1.38 million crabs), a decrease of 2% from the revised model abundance estimate of 3.82 million lb (1.45 million crabs) for legal male crabs for 2011.

The portion of the 2012 legal male crab abundance that is catchable to the commercial fishery, which primarily harvests crabs ≥ 5.0 in (127 mm) CW, was estimated to be 3.21 million lb (1.18 million crabs). An exploitation rate of 14.5% on the population catchable to the fishery equates to a guideline harvest level (GHL) of 465,450 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 34,910 lb preseason, with the open access fishery allocation set at 430,540 lb.

Summer Open Access Commercial Fishery

The 2012 summer open access commercial crab fishery was opened by emergency order at 12:00 noon, June 29, in Norton Sound Section, with a GHL of 430,540 lb 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-processor. NSSP operated a seafood processing plant in Nome and 2 tenders in eastern Norton Sound, while a fisherman based in Unalakleet flew live crabs to Aquatech in Anchorage. The majority of crabs were delivered to NSSP, while the catcher-sellers sold crabs directly to local residents. The single catcher-processor sold to a market in Korea as well as directly to local residents.

The first open-access delivery was made on July 1 and final delivery was made August 12, the day after the open access portion of the fishery was closed by emergency order at 6:00 p.m. for a total season length of 44 days compared to 33 days in 2011 (Table 14). In 2012, both buyers purchased crab continuously once the open access season was under way, with no reports of poor crab meat fill.

The open-access harvest from fish ticket reports was 149,604 red king crabs or 441,080 lb (102% of the open-access quota) (Table 14). Of this total, 242 lb were reported as deadloss, and 2,860 lb reported as personal use. A total of 29 vessels and 29 permit holders made 289 landings, and average weight for commercially caught crab was 2.9 lb. Number of pots registered was 1,200 (number of vessels registered was 30) and there were 9,395 pot pulls throughout the fishery, for a season CPUE of 16 crabs. In 2012, the open access catch rate was not as high as in 2011, but higher than the catch rates from the 4 years prior to 2011 (Appendix E9). Average price paid (including CDQ catch) was $5.41 per lb, the highest paid ever (Appendix E3). Exvessel value of the fishery (including CDQ) was $2,555,808, the highest since 1994 when Norton Sound was designated a super-exclusive area, which effectively changed the character of the fishery from a large vessel to a small vessel fishery (Appendix E10).

CDQ Fishery

For the third time, the CDQ fishery opened concurrently with the open-access fishery in 2012, because the Anchorage buyer was ready to purchase crab by the end of June. Consequently, both the CDQ and open access fisheries were opened on June 29. First CDQ delivery was made on July 1 and the last delivery was made September 8, when 100% of the CDQ allocation (34,910 lb) had been harvested, for a total length of 72 days (Table 14). In 2012, NSEDC wanted to stretch out the season that live crab is available for their markets; therefore, they stopped purchasing from CDQ crabbers on July 12 when roughly half of the CDQ quota was reached, and started buying again a week after the closure of the open access fishery on August 11. Unfortunately, due to storm conditions, crabbers were delayed harvesting the remainder of the CDQ quota, and molting crab showed up in deliveries made during the week of September 3. Fourteen permit-holders were registered to fish the CDQ fishery, but only 11 actually fished,

making a total of 23 landings and 646 pots lifts. Average price paid to fishermen was $5.40 per lb, for an exvessel value of $187,558 for the CDQ fishery (Appendix E3). This was the twelfth year a CDQ harvest occurred since the CDQ fishery was implemented in 1998, and the ninth year the fishery harvested or nearly harvested the entire allocation.

Fish ticket reports document that 9 statistical areas were fished in the open access and CDQ fisheries (Table 15), compared to 8 areas in 2011. Similar to last year, the top harvest came from statistical area 636401 (31%). Significant harvests also came from 3 other statistical areas: 626401 (24%), 646401 (21%), and 656401 (18%), all of which are directly south of the closed boundary line (Appendix E11). The catch from statistical areas east of 164°W longitude made up 56% of the harvest, similar to the 59% last year (Appendices E1 and E12).

Commercial Catch Sampling

Carapace length measurements and shell age were collected from 5,056 commercially-caught crabs 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 crabs made up 91% of the total legal crabs sampled, and old-shell crabs made up 9%. Recruit crabs are new-shell legal crabs <116 mm carapace length (CL). Postrecruit crabs are legal new-shell male crabs $\geq$116 mm CL and all legal old-shell males. Recruit crabs made up 33% of the legal crabs sampled and postrecruit crabs made up 67% (Appendix E4). Overall mean carapace length of legal male crabs was 118 mm. For comparison of historical length composition of Norton Sound red king crab summer commercial harvests from 1981 to 2012, see Appendices E17–E24.

Enforcement

No AWT trooper made dockside checks during the 2012 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, 2011, and 41 fishermen registered. Based on fish tickets submitted, the first landing was made December 30, 2011. From then until the last landing on May 15, the 35 fishermen that actually fished made a total of 319 landings, with an overall CPUE of 5, and average weight of 2.6 lb per crab. Price of crab averaged $6.47/lb, almost double the $3.59/lb in 2011, and total exvessel value of the fishery was $150,569, almost five times the amount from 2011. A total of 9,157 crabs (24,142 lb) were harvested, with percentages of crabs sold (and CPUE) each month as follows: January 1% (1), February 18% (5), March 26% (5), April 38% (7), and May 16% (6). Total number of crabs harvested was almost triple that of 2011 and more than triple the average harvest from 1978 to 2011 (Appendix E5). As an indicator of near-shore ice instability, commercial fishermen reported losing 64 pots during the 2011–2012 winter season. Pots were fished from 8 miles east to 10 miles west of Nome, excluding the area closed to commercial fishing from 3.5 miles east to 2.0 miles west of Nome. Unlike in previous years, when the majority of crabbers and harvest came from the Nome area, in 2012 only 7 crabbers and 25% of the harvest came from the Nome area. Both Shaktoolik (6 crabbers) and Unalakleet (13) crabbers harvested one-third each of the total harvest, with the remaining harvest coming from Elim, Golovin, and St. Michael areas.

The harvest is generally divided between local residents who buy crab directly from the crabbers, the seafood plant in Nome, and other non-local markets such as Anchorage. Most crabbers

consider 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, though the majority of the effort and harvest is from the winter fishery (Appendices E5 and E6). During the 2011–12 winter crab season, all of the 204 permits issued were returned, and the 138 permit holders that actually fished reported harvesting (keeping) 7,371 crab (compared to 6,640 crab for 2011). Residents of Brevig Mission, Elim, St. Michael, Shaktoolik, Unalakleet, and White Mountain had a combined harvest of 2,305 crab, over a third of the total harvest. Out of 242 pots reported fishing, 19 (8%) were reportedly lost during the season due to moving ice. Percentages of subsistence crab harvested each month are as follows: December 0%, January 3%, February 19%, March 35%, April 35%, May 6%, and unknown 2%. More than 99% of the crab were caught with pots.

During the 2011 Norton Sound summer subsistence crab season, 43 permits were issued, 42 returned, and out of 27 permit holders that set pots, 23 fishermen reported harvesting a total of 2,658 crab, over two-thirds of which were harvested near Nome. Crab kept per fisherman averaged 98 crab for summer 2011 (Appendix E6). Harvest data for summer of 2012 is not yet available.

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 non-resident 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 Comemercial Fisheries; Nome).

Future Resource Investigations

A winter pot study is planned in April of 2013, but for a much shorter duration than in previous years. Results of the winter project have been used in the length-based model to project the summer 2013 legal biomass and appropriate GHL for the summer commercial crab fishery. Size composition by year from the winter king crab project is shown in Appendix E8. In June 2013 a much larger tagging project is planned 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 2012. No permit holders fished in the Kotzebue section in 2012.

SECTION 5: MISCELLANEOUS SPECIES

INCONNU (SHEEFISH)

Commercial Fishery

Although inconnu *Stenodus leucichthys*, commonly known as sheefish, were likely 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 (Appendix F1). Sheefish are not commonly found in either Norton Sound or Port Clarence Districts.

Subsistence and Sport Fishery

Villages in Kotzebue Sound District were not surveyed for subsistence sheefish harvests from 1988 to 1990, and since 2004. Data from subsistence household surveys conducted by Divisions of Commercial Fisheries and Subsistence for 1966–1987 and 1991–2004 are presented in Appendix F2. These harvests may include winter, summer, and fall catches. 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.

Sport fish harvest reports indicate a harvest of 385 sheefish in 2011, but no harvest figures are yet available for 2012. Sheefish sport harvests in the last 10 years have averaged approximately 900 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 2012, test fishing on Kobuk River resulted in 326 sheefish caught in 151 drifts, for a cumulative CPUE of 353. The CPUE ranked 10 out of 15 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. In the 2011–2012 season, 3 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 the Norton Sound in recent history. Kotzebue District reported 300 caught but not sold during the 2012 commercial salmon fishery, compared to last year when 400 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, but data are not yet available. However, historical survey data collected by the Divisions of Sport Fish and Subsistence from 1959 to 2007 for the villages of Kivalina and Noatak are shown in Appendix F5.

Sport fish harvest is not yet available for 2012. Sport fish harvest was 4,041 Dolly Varden in Norton Sound in 2011 compared to 1,835 Dolly Varden in 2010 and 865 Dolly Varden were harvested in Kotzebue/Chukchi Sea areas compared to the 493 harvested in 2010 (Appendix F3). The majority of Dolly Varden sport fish harvest in Norton Sound was taken from Unalakleet River with 2,219 fish. Overall, Dolly Varden sport fish harvests in the last 10 years in Norton Sound averaged over 3,000 annually (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 2012, a survey on the Wulik River counted a total of 21,084 Dolly Varden (Appendix F7).

WHITEFISH

Commercial Fishery

Commercial whitefish harvest information the 2012–2013 season is not yet available. Whitefish was commercially harvested (2,148 lb sold for $0.50/lb) during the 2011–2012 season in Norton Sound by 1 permit holder, who waived confidentiality. Previous to that, the last reported Norton Sound harvest was during the 2006–2007 season when 1 fisherman, who waived confidentiality, sold a total of 3,723 lb for an average price of $.44/lb.

Subsistence and Sport Fishery

Subsistence harvest data for whitefish were not recorded for Norton Sound, Port Clarence of 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, but data are not yet available. However, historical survey data collected from various years during 1970–2004 for a few villages in Kotzebue District are shown in Appendix F8. 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 2011–2012 season, 7 permit holders harvested 3,780 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. This is an increase in participating fishermen but a decrease in pounds of saffron cod caught during the 2010–2011 season, when 5 permit holders harvested 8,031 lb of saffron cod at $0.50/lb. During the 2009–2010 season, 1 fisherman, who waived confidentiality,

harvested and sold 1,748 lb at $0.30/lb. This was the first reported commercial sale of saffron cod since 1995 (fish ticket database).

Subsistence and Sport Fishery

In Norton Sound areas tomcod are primarily fished by "jigging" through the ice. Since 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 2012, 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

Since no subsistence permit for capelin is required, harvests of capelin are usually not reported or documented. No other information on capelin harvest is available.

ACKNOWLEDGEMENTS

Employees of the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service including the Office of Subsistence Management, Bureau of Land Management, National Park Service, Norton Sound Economic Development Corporation, Unalakleet IRA, LGL, and other agencies and organizations worked long and irregular hours at various locations throughout the Norton Sound, Kotzebue, and Port Clarence Areas collecting data presented in this report; we gratefully acknowledge their hard work and funding support.

REFERENCES CITED

ADF&G (Alaska Department of Fish and Game). 1967. 1966 annual report. Arctic-Yukon-Kuskokwim area. Alaska Department of Fish and Game, Division of Commercial Fisheries, Annual Management Report, Anchorage.

Barton, L. H. 1978. Finfish resource surveys in Norton Sound and Kotzebue; final report, Alaska Marine Environment Assessment Project, Research Unit 19. Alaska Department of Fish and Game, Division of Commercial Fisheries, AYK Region OCS Report No. 13, Anchorage.

Bockstoce, J. 1979. The archeology of Cape Nome, Alaska. The University Museum, University of Pennsylvania, Philadelphia.

Bue F. J., T. L. Lingnau, C. F. Lean, and E. L. Brennan. 1997. Annual management report 1996, Norton Sound-Port Clarence-Kotzebue. Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development, Regional Information Report 3A97-30, Anchorage.

Clark, J. H. 2001. Biological escapement goal for chum salmon in District 1 of Norton Sound. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report. 3A01-09, Anchorage.

DeCicco, F. 2001. Fishery management report for sport fisheries in the Northwest Alaska regulatory areas, 1999-2000. Alaska Department of Fish and Game, Fishery Management Report No. 01-1, Anchorage.

REFERENCES CITED (Continued)

Estensen J. L., G. L. Todd, and C. S. Monsivais. 2005. Estimation of abundance and distribution of chum salmon in the Unalakleet River drainage, 2004. Alaska Department of Fish and Game, Fishery Data Series No. 05-52, Anchorage.

Estensen J. L., and T. Hamazaki. 2007. Estimation of abundance and distribution of chum salmon (*Oncorhynchus keta)* in the Unalakleet River drainage, 2005. Alaska Department of Fish and Game, Fishery Data Series No. 07-03, Anchorage.

Gaudet D. M., and G. Schaefer. 1982. Migrations of salmon in Norton Sound, Alaska determined by tagging in 1978-1979. Alaska Department of Fish and Game, Division of Commercial Fisheries, Informational Leaflet No. 198, Juneau.

Georgette, S., D. Caylor and S. Tahbone. 2003a. Subsistence salmon harvest summary, northwest Alaska 2001. Alaska Department of Fish and Game, Division of Subsistence and Kawerak, Inc.

Georgette, S., D. Caylor and S. Tahbone. 2003b. Subsistence salmon harvest summary, northwest Alaska 2002. Alaska Department of Fish and Game, Division of Subsistence and Kawerak, Inc.

Georgette, S., D. Caylor and E. Trigg. 2004. Subsistence salmon harvest summary, northwest Alaska 2003. Alaska Department of Fish and Game, Division of Subsistence and Kawerak, Inc.

Georgette, S., and A. Shiedt. 2005. Whitefish: traditional ecological knowledge and subsistence fishing in the Kotzebue Sound Region, Alaska. Alaska Department of Fish and Game and Maniilaq Association, Technical Paper No. 290, Juneau.

Jones, W. J. 2006. North River salmon counting tower project, 2002-2004. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report. 3A06-04, Anchorage.

Joy P., A. L. J. Brase, and D. J. Reed. 2005. Estimation of coho salmon abundance and spawning distribution in the Unalakleet River 2004. Alaska Department of Fish and Game, Fishery Data Series No. 05-38. Anchorage.

Joy P., and D. J. Reed. 2006. Estimation of coho salmon abundance and spawning distribution in the Unalakleet River 2005. Alaska Department of Fish and Game, Fishery Data Series No. 06-38. Anchorage.

Joy P., and D. J. Reed. 2007. Estimation of coho salmon abundance and spawning distribution in the Unalakleet River 2004-2006, final report for study 05-101 USFWS, Office of Subsistence Management Fishery Information Service Division. Alaska Department of Fish and Game, Fishery Data Series No. 07-48. Anchorage.

Kent, S., G. Knuepfer and L. Neff. 2008. Salmonid escapements at Kwiniuk, Niukluk and Nome rivers, 2007. Alaska Department of Fish and Game, Fishery Data Series No. 08-57, Anchorage.

Kent, S. 2010. Unalakleet River salmon studies, 2002-2008. Alaska Department of Fish and Game, Fishery Data Series No. 10-83, Anchorage.

Kohler, T. G. 2003. Salmonid escapements into selected Norton Sound drainages using towers and weirs, 2003. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report. 3A03-33, Anchorage.

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

Menard, J., J. Soong and S, Kent. 2010. 2008 Annual management report Norton Sound, Port Clarence, and Kotzebue. Alaska Department of Fish and Game, Fishery Management Report No. 10-49, Anchorage.

Menard, J., J. Soong and S. Kent. 2012. 2011 Annual management report Norton Sound, Port Clarence, and Kotzebue. Alaska Department of Fish and Game, Fishery Management Report No. 12-39, Anchorage.

NPFMC (North Pacific Fisheries Management Council). 2011. Stock assessment and fishery evaluation report for the king and Tanner crab fisheries of the Bering Sea and Aleutian Islands Regions. Stock Assessment and Fishery Evaluation Reports. North Pacific Fishery Management Council. 605 W. 4th Ave., #306, Anchorage.

REFERENCES CITED (Continued)

Pahlke, K. A. 1985. Preliminary studies of capelin (*Mallotus villosus)* in Alaska waters. Alaska Department of Fish and Game, Division of Commercial Fisheries, Informational Leaflet 250, Juneau.

Pedersen, S., and A. Linn Jr. 2005. North Slope (Kaktovik) subsistence fish harvest assessment. Anchorage, Alaska., USFWS Office of Subsistence Management, Fisheries Resource Monitoring Program, Annual Report No. FIS 01-101.

Pedersen, S., and S. C. Hugo. 2005. North Slope (Anaktuvuk Pass) subsistence fish harvest assessment. Anchorage, Alaska., USFWS Office of Subsistence Management, Fisheries Resource Monitoring Program, Annual Report No. FIS 02-050-3.

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

Scanlon, B. 2009. Fishery management report for sport fisheries in the Northwest/North Slope Management Area, 2008. Alaska Department of Fish and Game, Fishery Management Report No. 09-48, Anchorage.

Schwarz, L., C. Lean, J. Dinnocenzo, B. Bigler, and S. Merkouris-Smith. 1982. Annual management 1982 Norton Sound-Port Clarence-Kotzebue. Alaska Department of Fish and Game, Division of Commercial Fisheries, Annual Management Report Norton Sound, Anchorage.

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

Todd, G. L., C.S, Monsivais and D. F. Kaplan. 2005. Estimation of chum salmon abundance, migration timing and spawning distribution in the Fish River complex, Norton Sound Alaska, 2002-2004. Alaska Department of Fish and Game, Fishery Data Series No. 05-67, Anchorage.

Wilimovsky, N. J., and J. N. Wolfe, editors. 1966. Environment of Cape Thompson Region, Alaska. United States Committee on Environmental Studies for Project Chariot, United States Atomic Energy Commission, Division of Technical Information, Oak Ridge, TN.

Wuttig K. G. 1998. Escapement of Chinook salmon in the Unalakleet River in 1997. Alaska Department of Fish and Game, Fishery Data Series No. 98-08, Anchorage.

Wuttig K. G. 1999. Escapement of Chinook salmon in the Unalakleet River in 1998. Alaska Department of Fish and Game, Fishery Data Series No. 99-10, Anchorage.

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

TABLES

Table 1.–Norton Sound commercial salmon harvest summary by subdistrict, 2012.

		Subdistricts						
		1	2	3	4	5	6	Total
Number of Fishermen [a]		0	14	24	18	21	55	123
Chinook [b]	Number	0	0	0	0	0	0	0
	Weight (lb)	0	0	0	0	0	0	0
Sockeye	Number	0	0	1	15	27	57	100
	Weight (lb)	0	0	8	103	194	386	691
Coho	Number	0	569	2,003	4,376	7,827	22,188	36,963
	Weight (lb)	0	3,809	13,839	29,456	53,090	144,884	245,078
Pink	Number	0	31,055	52,775	49,970	19,197	52,406	205,403
	Weight (lb)	0	74,735	130,822	114,202	49,568	123,045	492,372
Chum	Number	0	3,791	2,262	8,417	20,141	28,154	62,765
	Weight (lb)	0	21,675	13,639	57,902	140,557	191,460	425,233
Total	Number	0	35,415	57,041	62,778	47,192	102,805	305,231
	Weight (lb)	0	100,219	158,308	201,663	243,409	459,775	1,163,374

Note: An additional 197 Chinook, 34 sockeye, 93 coho, 95 pink, and 7 chum salmon were retained for personal use. Average commercial weights by species were 6.91 lb for sockeye salmon, 6.63 lb for coho salmon, 2.4 lb for pink salmon and 6.78 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.

[b] The buyer did not buy Chinook salmon in 2012; all were retained for personal use.

Table 2.–Subsistence salmon harvest for northern Norton Sound, 2012.

	Permits Fished [a]	Number of Salmon Harvested					
		Chinook	Sockeye	Coho	Pink	Chum	Total
Marine Waters	44	5	137	436	1,462	1,673	3,713
Bonanza River	15	0	0	65	641	129	835
Cripple Creek	14	0	1	11	43	0	55
Eldorado River	18	0	4	110	917	296	1,327
Flambeau River	5	0	0	6	66	12	84
Safety Sound	1	0	0	2	0	3	5
Nome River- above weir	13	0	0	14	64	2	80
Nome River- below weir	229	5	10	257	3,911	336	4,519
Penny River	17	0	0	8	375	0	383
Sinuk River	28	0	17	84	296	15	412
Snake River - below weir	61	1	2	120	480	53	656
Solomon River	20	0	0	37	121	2	160
Other Creeks/Rivers	0	0	0	0	0	0	0
Nome Subdistrict Total [b]	340	11	171	1,150	8,376	2,521	12,229
Cape Woolley [c]	4	1	0	0	0	29	30
Marine Waters	19	39	44	196	1,128	543	1,950
Kachavik River	9	0	0	12	857	225	1,094
McKinley River	1	0	0	5	8	0	13
Chinik Creek	5	0	0	37	58	7	102
Fish River	50	18	3	622	4,603	264	5,510
Niukluk River- above tower	20	0	2	187	681	17	887
Niukluk River- below tower	9	0	3	77	0	0	80
Other Creeks/Rivers	5	0	0	7	300	0	307
Golovin Subdistrict Total [d]	97	57	52	1,143	7,635	1,056	9,943
Marine Waters	21	29	0	644	6,841	1,167	8,681
Kwiniuk River - above tower	15	1	0	88	1,100	40	1,229
Kwiniuk River - below tower	33	6	0	425	1,629	116	2,176
Next Creek	2	0	0	4	5	0	9
Tubutulik River	17	6	0	137	1,129	171	1,443
Iron Creek	5	0	0	4	144	0	148
Other Creeks/Rivers	0	0	0	0	0	0	0
Elim Subdistrict Total [e]	54	42	0	1,302	10,848	1,494	13,686
Port Clarence - Marine Waters	81	33	593	673	4,727	6,271	12,297
Tuksuk Channel	11	5	178	24	446	1,214	1,867
Imuruk Basin	0	0	0	0	0	0	0
Agiapuk River	1	0	0	0	0	97	97
Kuzitrin River	3	0	0	1	0	1	2
Pilgrim River- above weir	17	0	67	5	11	88	171
Pilgrim River- below weir	49	6	584	0	16	131	737
Port Clarence District Total [f]	156	44	1,422	703	5,200	7,802	15,171
Total	651	155	1,645	4,298	32,059	12,902	51,059

[a] There were 6 locations where subsistence permits were issued in 2012 for northern Norton Sound: 1-Nome Subdistrict; 2-Cape Woolley; 3-Golovin Subdistrict; 4-Elim Subdistrict; 5-Pilgrim River; and 6-Port Clarence District. Except for Pilgrim River, each permit is valid for both marine and fresh waters. Permits fished include those permit holders who fished, but reported no harvest.

[b] All 483 Nome Subdistrict permits issued were returned.

[c] All 20 Cape Woolley permits issued were returned.

[d] All 151 Golovin Subdistrict permits issued were returned.

[e] All 63 Elim Subdistrict permits issued were returned.

[f] All 188 Pilgrim River permits issued were returned, and all 147 Port Clarence District permits issued were returned. Salmon Lake was closed and no permits were issued.

Table 3.–Salmon counts of rivers and associated salmon escapement goal ranges (SEG, BEG or OEG), Norton Sound and Port Clarence, 2012.

	Chinook Salmon				Chum Salmon				
Stream	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.									
Grand Central R.									
Agiapuk R.									
American R.									
Pilgrim R.	64				25,521				
Glacial L.	0				25				
Sinuk R.							3,650	10,537	
Cripple R.									
Penny R.									
Anvil Creek									
Dry Creek									
Snake R.	1				1,235	1,600 - 2,500 [b]			
Nome R.	6				2,015	2,900 - 4,300 [b]			
Flambeau R.							7,911	17,517	
Eldorado R.	0				13,393	6,000 - 9,200 [b]			
Bonanza R.							1,550	6,002	
Solomon R.							165	1,377	
Nome Subdistrict						**23,000 - 35,000** [c]		**52,076**	
Fish R.				**Combined**					
Boston Cr.				**100 - 250**					
Niukluk R.	27				19,576	23,000			
Ophir Cr.									
Kwiniuk R.	54	300 - 550			5,577	11,500 - 23,000 [d]			
Tubutulik R.						9,200 - 18,400 [d, e]			
Ungalik R.									
Inglutalik R	1,134				32,832				
Pikmiktalik R									
Shaktoolik R.				400 - 800					
Unalakleet R.	807			**Combined**	70,669				**Combined**
Old Woman R.				**550 - 1,100**					**2,400 - 4,800**
North R.	996			1,200-2,600	9,042				

-continued-

Table 3.–Page 2 of 2.

Stream	Coho Salmon Weir/ Tower Count	Coho Salmon Aerial Survey Count [a]	Coho Salmon Escapement Goal Range	Sockeye Salmon Weir/ Tower Count	Sockeye Salmon Aerial Survey Count [a]	Sockeye Salmon Escapement Goal Range	Pink Salmon Weir/ Tower Count	Pink Salmon Escapement Goal Range	Pink Salmon Aerial Survey Count [a]
Salmon L.					4,730	**Combined**			
Grand Central R.					1,100	**4,000 - 8,000**			
Agiapuk R.									
American R.									
Pilgrim R.	95			7,085			46,135		
Glacial L.				1,636		800 - 1,600	165		
Sinuk R.					5				506,500
Cripple R.									
Penny R.									
Anvil Creek									
Dry Creek									
Snake R.	14			3			5,954		
Nome R.	224			48			149,119	13,000	
Flambeau R.					3				
Eldorado R.	0						59,952		
Bonanza R.									54,700
Solomon R.					1				15,000
Fish R.									
Boston Cr.			**Tower Goal**						
Niukluk R.	1,729	928	**2,400-7,200**	3			249,212	10,500	
Ophir Cr.		42							
Kwiniuk R.	777		650-1,300				393,302	8,400	
Tubutulik R.		2,889							
Ungalik R.									
Inglutalik R	1,431						90,349		
Pikmiktalik R									
Shaktoolik R.									
Unalakleet R.	17,766			234			672,083		
Old Woman R.									
North R.	3,036		550-1,100				147,674	25,000	

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

[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, 2012.

Period	Target Species	Dates Fished	Length (hours)	Permits Fished	Chinook Harvest	Chum Harvest	Pink Harvest	Sockeye Harvest	Coho Harvest
1	Pink	7/14–7/15	24	7	0	853	9,356	0	0
2	Pink	7/16–7/17	24	7	0	383	4,828	0	0
3	Pink	7/18–7/24	144	13	0	2,366	16,871	0	16
4	Chum	7/26–7/27	36	4	0	146	0	0	31
5	Coho	8/14–8/15	36	8	0	43	0	0	453
6	Coho	8/20–8/22	48	4	0	0	0	0	48
7	Coho	8/24–8/26	48	No One Fished – Bad Weather					
8	Coho	8/29–9/01	72	Catch Information Confidential					
Totals			432	14	0	3,791	31,055	0	569

Note: There were an additional 2 Chinook, 14 sockeye, and 4 coho salmon retained for personal use in 2012.

Table 5.–Commercial salmon set gillnet catches from Elim, Subdistrict 3, Norton Sound, 2012.

Period	Target Species	Dates Fished	Length (hours)	Permits Fished	Chinook Harvest	Chum Harvest	Pink Harvest	Sockeye Harvest	Coho Harvest
1	Pink	7/07–7/08	24	9	0	441	5,540	0	0
2	Pink	7/10–7/11	24	12	0	667	11,699	0	0
3	Pink	7/14–7/14	12	14	0	273	10,738	0	0
4	Pink	7/16–7/18	48	No One Fished – Bad Weather					
5	Pink	7/19–7/23	96	16	0	756	24,798	1	10
6	Coho	8/12–8/13	24	15	0	21	0	0	339
7	Coho	8/14–8/16	48	5	0	5	0	0	102
8	Coho	8/21–8/23	48	No One Fished – Bad Weather					
9	Coho	8/25–8/27	48	9	0	75	0	0	925
10	Coho	8/28–8/31	72	9	0	24	0	0	627
Totals			444	24	0	2,262	52,775	1	2,003

Note: There were an additional 3 Chinook salmon retained for personal use in 2012.

Table 6.–Commercial salmon set gillnet catches from Norton Bay, Subdistrict 4, Norton Sound, 2012.

Period	Target Species	Dates Fished	Length (hours)	Permits Fished	Chinook Harvest	Chum Harvest	Pink Harvest	Sockeye Harvest	Coho Harvest
1	Pink	7/03–7/05	48	6	0	500	13,774	0	0
2	Pink	7/08–7/10	48	10	0	306	25,064	0	0
3	Pink	7/14–7/14	12	9	0	329	3,861	0	0
4	Pink	7/15–7/16	24	8	0	618	3,865	0	0
5	Chum	7/19–7/20	36	11	0	2,906	3,406	0	24
6	Chum	7/22–7/23	36	9	0	1,243	0	1	52
7	Chum	7/26–7/28	48	No One Fished –Bad Weather					
8	Chum	7/29–7/31	48	10	0	988	0	12	664
9	Coho	8/01–8/03	48	9	0	462	0	2	561
10	Coho	8/05–8/07	48	10	0	631	0	0	1,309
11	Coho	8/08–8/10	48	12	0	244	0	0	865
12	Coho	8/11–8/14	72	10	0	172	0	0	729
13	Coho	8/15–8/17	48	No One Fished – Bad Weather					
14	Coho	8/19–8/21	48	No One Fished – Bad Weather					
15	Coho	8/22–8/24	48	No One Fished – Bad Weather					
16	Coho	8/26–8/28	48	Catch Information Confidential					
17	Coho	8/29–8/31	48	Catch Information Confidential					
18	Coho	9/02–9/04	48	No One Fished - Unfavorable Weather					
19	Coho	9/05–9/07	48	No One Fished – Loss of Fishermen Interest					
Totals			852	18	0	8,417	49,970	15	4,376

Note: There were an additional 10 Chinook, 1 sockeye, and 2 coho salmon retained for personal use in 2012.

Table 7.–Commercial salmon set gillnet catches from Shaktoolik, Subdistrict 5, Norton Sound, 2012.

Period	Target Species	Dates Fished	Length (hours)	Permits Fished	Chinook Harvest	Chum Harvest	Pink Harvest	Sockeye Harvest	Coho Harvest
1	Pink	7/03–7/04	12	3	0	434	1,728	0	0
2	Pink	7/05–7/05	12	4	0	595	4,733	0	0
3	Chum	7/06–7/07	24	11	0	4,902	599	0	0
4	Pink	7/10–7/11	24	7	0	571	9,904	0	0
5	Chum	7/12–7/13	24	15	0	5,083	1,124	3	5
6	Chum	7/14–7/16	48	18	0	3,548	829	14	13
7	Chum	7/28–7/21	72	16	0	2,656	270	8	206
8	Chum	7/22–7/24	48	10	0	681	10	0	112
9	Chum	7/25–7/27	48	No One Fished – Bad Weather					
10	Chum	7/29–7/31	48	13	0	392	0	0	1,169
11	Coho	8/01–8/04	72	16	0	294	0	0	920
12	Coho	8/06–8/08	48	15	0	535	0	0	2,359
13	Coho	8/09–8/11	48	17	0	91	0	0	394
14	Coho	8/12–8/14	48	13	0	252	0	0	684
15	Coho	8/15–8/17	48	No One Fished – Bad Weather					
16	Coho	8/19–8/21	48	3	0	0	0	0	23
17	Coho	8/22–8/24	48	8	0	7	0	0	283
18	Coho	8/26–9/01	144	17	0	94	0	2	1,590
19	Coho	9/02–9/04	48	6	0	4	0	0	50
20	Coho	9/05–9/07	48	Catch Information Confidential					
Totals			960	21	0	20,141	19,197	27	7,827

Note: There were an additional 25 Chinook, 56 pink, 2 sockeye, and 1 coho salmon retained for personal use in 2012.

Table 8.–Commercial salmon set gillnet catches from Unalakleet, Subdistrict 6, Norton Sound, 2012.

Period	Target Species	Dates Fished	Length (hours)	Permits Fished	Chinook Harvest	Chum Harvest	Pink Harvest	Sockeye Harvest	Coho Harvest
1	Pink	7/03–7/04	12	13	0	385	6,939	0	0
2	Chum	7/05–7/06	24	17	0	2,617	1,230	0	0
3	Pink	7/06–7/07	24	21	0	1,274	26,647	0	0
4	Chum	7/09–7/10	24	16	0	629	659	1	0
5	Pink	7/11–7/12	24	No One Fished – No Tender					
6	Pink	7/12–7/13	24	19	0	838	13,257	0	0
7	Chum	7/14–7/16	48	27	0	6,308	2,606	9	16
8	Chum	7/18–7/21	72	27	0	6,387	1,068	28	421
9	Chum	7/22–7/24	48	30	0	1,289	0	1	235
10	Chum	7/25–7/27	48	27	0	3,138	0	8	1,259
11	Chum	7/29–7/31	48	28	0	1,485	0	0	1,643
12	Coho	8/01–8/04	72	36	0	1,485	0	5	2,655
13	Coho	8/06–8/08	48	34	0	625	0	1	3,795
14	Coho	8/09–8/11	48	36	0	359	0	1	1,647
15	Coho	8/12–8/14	48	33	0	476	0	0	1,760
16	Coho	8/15–8/17	48	18	0	345	0	0	1,922
17	Coho	8/19–8/21	48	25	0	235	0	1	2,095
18	Coho	8/22–8/24	48	33	0	77	0	0	1,050
19	Coho	8/26–9/01	144	32	0	148	0	2	2,841
20	Coho	9/02–9/04	48	8	0	31	0	0	407
21	Coho	9/05–9/07	48	10	0	23	0	0	442
Totals			996	55	0	28,154	52,406	57	22,188

Note: There were an additional 157 Chinook, 7 chum, 39 pink, 17 sockeye, and 86 coho salmon retained for personal use in 2012.

Table 9.–Kotzebue District commercial chum salmon catch and average weight by date, 2012.

Date	Number of Fishermen	Number of Landings	Catch	Pounds	Average Weight
7/10	7	9	1,580	12,220	7.7
7/11	16	23	4,470	34,464	7.7
7/12			Catch Information Confidential		
7/13	26	42	5,709	45,079	7.9
7/14	23	25	3,134	23,394	7.5
7/17	12	12	1,360	10,674	7.8
7/18	35	50	4,275	33,994	8.0
7/19	35	40	4,122	32,718	7.9
7/20	38	57	7,739	62,523	8.1
7/21	36	42	6,639	53,115	8.0
7/22	17	17	3,186	25,682	8.1
7/23	48	67	11,365	90,959	8.0
7/24	28	39	5,317	42,225	7.9
7/25	24	31	3,419	27,380	8.0
7/26	24	32	3,675	29,178	7.9
7/27	40	62	9,362	74,571	8.0
7/28	16	16	2,357	18,612	7.9
7/31	46	61	10,514	79,560	7.6
8/1	39	56	11,726	89,254	7.6
8/2	53	102	32,704	254,988	7.8
8/3			Catch Information Confidential		
8/4			Catch Information Confidential		
8/5	32	35	8,681	64,246	7.4
8/6	51	54	10,597	79,496	7.5
8/7	28	31	7,556	56,351	7.5
8/8	53	61	15,817	117,608	7.4
8/10	52	53	11,728	87,016	7.4
8/12	42	43	7,456	56,340	7.6
8/13	46	47	8,349	63,569	7.6
8/14	42	48	10,816	83,368	7.7
8/15	8	8	1,083	7,604	7.0
8/16	17	17	2,051	14,714	7.2
8/17	23	23	2,271	16,454	7.2
8/19	11	11	763	5,548	7.3
8/20	26	26	2,451	16,998	6.9
8/21	8	8	973	6,674	6.9
8/22	12	12	475	3,114	6.6
8/23	14	14	811	5,410	6.7
8/26	10	10	673	4,286	6.4
8/27	14	14	897	6,146	6.9
8/28	11	11	416	2,907	7.0
8/29	8	8	401	2,872	7.2
8/30	6	6	399	2,688	6.7
Total	83	1,326	227,965	1,751,473	7.7

Note: Also harvested during the 2012 commercial fishery and kept for personal use were 7 Chinook salmon, 6 sockeye salmon, 445 pink salmon, 18 coho salmon, 300 Dolly Varden, 1,867 sheefish, 27 whitefish, 1 tom cod, and 2 pike.

Table 10.–Historical chum salmon catch for Kobuk River drift test fishery, 1993–2012.

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

[a] Cumulative 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 bait fishery summary by period, Norton Sound District, 2012.

Period	Date	Unique Permits	Landings	Pounds	Total Short Tons	Fishery Value
1	6/15–7/01	8	16	13,642	6.8	$4,106.70
		8	16	13,642	6.8	$4,106.70

Note: Price per short ton of bait herring was $600 in 2012.

Table 12.–Commercial herring sac roe harvest summary by period and subdistrict, Norton Sound District, 2012.

	St. Michael Subdistrict (333-70)			Unalakleet Subdistrict (333-72)			Cape Denbigh Subdistrict (333-74)			Norton Sound District Total		
Date	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
There was no herring sac roe harvest in 2012.												
Total												

Table 13.–Daily observed peak biomass estimates of Pacific herring, Norton Sound District, 2012.

	Flight	Observer	Survey		Spawn		Estimated Biomass (in short ton) By Index Area [a]							
Date	No.	Initials	Hours	Rating	No.	Length (mi.)	KLK	UNK	CDB	NTB	ELM	GOL	NOM	TOTAL
There were no surveys conducted in 2012 due to vast extent of sea ice.														
Total														
													Peak Survey	
													Total Harvest	
													Biomass	
													Exploit %	

Note: Data not available for all index areas.

[a] KLK = Klikitarik, UNK = Unalakleet, CDB = Cape Denbigh, NTB = Norton Bay, ELM = Elim, GOL = Golovin, NOM = Nome.

Table 14.–Daily catch for the open access and CDQ summer commercial king crab harvests, Norton Sound Section, Eastern Bering Sea, June 29–September 8, 2012.

Date [a]	Landings	Number Crab	Crab Harvested (lb)	Cumulative Total (lb)	Number Pots Pulled	Average Weight (lb)	CPUE
			Open Access				
7/01	1	12	34	34	1	2.8	12
7/02	8	4,583	13,322	13,356	276	2.9	17
7/03	2	78	231	13,587	11	3.0	7
7/04	6	3,064	8,739	22,326	209	2.9	15
7/05	5	2,149	6,135	28,461	83	2.9	26
7/06	6	3,146	8,992	37,453	219	2.9	14
7/07	2	92	243	37,696	21	2.6	4
7/08	8	3,510	9,990	47,686	242	2.8	15
7/09	2	1,707	4,931	52,617	77	2.9	22
7/10	2	1,119	3,311	55,928	41	3.0	27
7/11	11	6,825	19,489	75,417	381	2.9	18
7/12	4	2,849	8,303	83,720	121	2.9	24
7/13	6	2,272	6,609	90,329	170	2.9	13
7/14	9	4,734	13,545	103,874	350	2.9	14
7/15	11	5,721	16,935	120,809	388	3.0	15
7/16	2	469	1,389	122,198	41	3.0	11
7/17	12	3,610	10,555	132,753	292	2.9	12
7/19	1	15	30	132,783	1	2.0	15
7/20	18	9,935	28,740	161,523	631	2.9	16
7/21	8	4,802	13,721	175,244	280	2.9	17
7/22	7	2,671	7,833	183,077	221	2.9	12
7/23	9	4,903	14,353	197,430	350	2.9	14
7/24	5	2,021	5,976	203,406	158	3.0	13
7/27	6	5,133	15,076	218,482	238	2.9	22
7/28	1	1,171	3,499	221,981	40	3.0	29
7/29	3	3,027	9,473	231,454	113	3.1	27
7/30	10	6,744	19,757	251,211	343	2.9	20
7/31	12	7,568	21,917	273,128	353	2.9	21
8/01	4	1,532	4,481	277,609	122	2.9	13
8/02	15	6,181	18,304	295,913	493	3.0	13
8/03	5	1,714	4,943	300,856	186	2.9	9
8/04	2	837	2,480	303,336	77	3.0	11
8/05	13	8,976	27,317	330,653	504	3.0	18
8/06	3	1,189	3,605	334,258	119	3.0	10
8/07	7	4,252	12,831	347,089	224	3.0	19
8/08	11	7,189	21,649	368,738	365	3.0	20
8/09	12	6,518	19,521	388,259	358	3.0	18
8/10	13	5,488	16,626	404,885	455	3.0	12
8/11	21	8,893	27,348	432,233	639	3.1	14
8/12	6	2,905	8,847	441,080	202	3.0	14
Total	289	149,604	441,080	441,080	9,395	2.9	16

-continued-

Table 14.–Page 2 of 2.

Date [a]	Landings	Number Crab	Crab Harvested (lb)	Cumulative Total (lb)	Number Pots Pulled	Average Weight (lb)	CPUE
			CDQ				
7/01	1	519	1,567	1,567	40	3.0	13
7/04	5	1,692	5,008	6,575	144	3.0	12
7/06	3	2,030	5,929	12,504	120	2.9	17
7/08	1	602	1,777	14,281	20	3.0	30
7/11	1	849	2,391	16,672	40	2.8	21
7/12	1	98	377	17,049	22	3.8	4
8/30	1	476	1,386	18,435	40	2.9	12
9/02	3	2,162	6,726	25,161	83	3.1	26
9/03	3	1,584	4,969	30,130	34	3.1	47
9/07	2	749	2,390	32,520	54	3.2	14
9/08	2	748	2,390	34,910	49	3.2	15
Total	23	11,509	34,910	34,910	646	3.0	18

Source: Fish ticket data.

[a] The open access fishery closed by regulation 8/11, and the last delivery was made 8/12. The CDQ fishery closed by regulation 9/8, and last delivery was made 9/8.

Table 15.–Commercial harvest of red king crab from Norton Sound Section by statistical area, Norton Sound District, 2012.

Statistical Area	Number Crab [a]	Crab Harvested (lb)	Number Pots Pulled	CPUE	Average Weight (lb)
626401	39,403	115,524	2,063	19	2.9
636330	492	1,454	56	9	3.0
636401	50,557	148,183	2,868	18	2.9
646330	408	1,204	35	12	3.0
646401	33,721	98,811	2,646	13	2.9
656330	2,617	8,168	80	33	3.1
656401	28,688	85,920	2,002	14	3.0
666330	331	1,000	40	8	3.0
666401	4,896	15,726	251	20	3.2
Total	161,113	475,990	10,041	16	3.0

Note: Data for summer fishery only.

[a] Includes 11,509 crabs (34,910 lb) from the CDQ fishery.

APPENDIX A: NORTON SOUND FISHERIES

Appendix A1.–Commercial salmon catch by species, Norton Sound District, 1961–2012.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,300	35	13,807	34,327	48,332	101,801
1962	7,286	18	9,156	33,187	182,784	232,431
1963	6,613	71	16,765	55,625	154,789	233,863
1964	2,018	126	98	13,567	148,862	164,671
1965	1,449	30	2,030	220	36,795	40,524
1966	1,553	14	5,755	12,778	80,245	100,345
1967	1,804	–	2,379	28,879	41,756	74,818
1968	1,045	–	6,885	71,179	45,300	124,409
1969	2,392	–	6,836	86,949	82,795	178,972
1970	1,853	–	4,423	64,908	107,034	178,218
1971	2,593	–	3,127	4,895	131,362	141,977
1972	2,938	–	454	45,182	100,920	149,494
1973	1,918	–	9,282	46,499	119,098	176,797
1974	2,951	–	2,092	148,519	162,267	315,829
1975	2,393	2	4,593	32,388	212,485	251,861
1976	2,243	11	6,934	87,916	95,956	193,060
1977	4,500	5	3,690	48,675	200,455	257,325
1978	9,819	12	7,335	325,503	189,279	531,948
1979	10,706	57	31,438	167,411	140,789	350,401
1980	6,311	40	29,842	227,352	180,792	444,337
1981	7,929	56	31,562	232,479	169,708	441,734
1982	5,892	10	91,690	230,281	183,335	511,208
1983	10,308	27	49,735	76,913	319,437	456,420
1984	8,455	6	67,875	119,381	146,442	342,159
1985	19,491	166	21,968	3,647	134,928	180,200
1986	6,395	233	35,600	41,260	146,912	230,400
1987	7,080	207	24,279	2,260	102,457	136,283
1988	4,096	1,252	37,214	74,604	107,966	225,132
1989	5,707	265	44,091	123	42,625	92,811
1990	8,895	434	56,712	501	65,123	131,665
1991	6,068	203	63,647	0	86,871	156,789
1992	4,541	296	105,418	6,284	83,394	199,933
1993	8,972	279	43,283	157,574	53,562	263,670
1994	5,285	80	102,140	982,389	18,290	1,108,184
1995	8,860	128	47,862	81,644	42,898	181,392
1996	4,984	1	68,206	487,441	10,609	571,241
1997	12,573	161	32,284	20	34,103	79,141
1998	7,429	7	29,623	588,013	16,324	641,396
1999	2,508	0	12,662	0	7,881	23,051
Average 2007–2011	102	132	90,896	27,071	61,995	180,197
Average 2002–2011	72	74	73,165	13,536	33,446	120,293

-continued-

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
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
Average 2007-2011	102	132	90,896	27,071	61,995	180,197
Average 2002-2011	72	74	73,165	13,536	33,446	120,293

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

[a] All Chinook salmon caught were retained for personal use, not sold.

Appendix A2.–Number of commercial salmon permits fished, Norton Sound, 1970–2012.

Year	Subdistrict 1	2	3	4	5	6	District Total [a]
1970	6	33	21	0	12	45	[b]
1971	7	22	45	6	19	72	[b]
1972	20	20	48	32	20	71	[b]
1973	21	34	57	30	27	94	[b]
1974	25	25	60	8	23	53	[b]
1975	24	42	67	42	39	61	[b]
1976	21	22	54	27	37	60	[b]
1977	14	25	52	24	30	45	164
1978	16	24	44	26	26	51	176
1979	15	21	41	22	29	63	175
1980	14	17	26	13	26	66	159
1981	15	19	33	10	26	73	167
1982	18	17	28	10	32	68	164
1983	19	21	39	15	34	72	170
1984	8	22	25	8	24	74	141
1985	9	21	34	12	21	64	155
1986	13	24	34	9	30	73	163
1987	10	21	34	12	39	65	164
1988	5	21	36	13	21	69	152
1989	2	0	13	0	26	73	110
1990	0	15	23	0	28	73	128
1991	0	16	24	0	25	75	126
1992	2	1	21	9	25	71	110
1993	1	8	26	15	37	66	153
1994	1	5	21	0	39	71	119
1995	2	7	12	0	26	58	105
1996	1	4	12	0	20	54	86
1997	0	11	21	9	19	57	102
1998	0	16	23	0	28	52	82
1999	0	0	0	0	15	45	60
2000	0	12	13	0	26	49	79
2001	0	5	5	0	13	29	51
2002	0	0	0	0	7	5	12
2003	0	0	0	0	10	20	30
2004	0	0	0	0	11	25	36
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
Avg 2007–2011	0	6	18	6	25	56	98
Avg 2002–2011	0	3	9	3	19	40	67

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

[b] Data not available.

Appendix A3.–Round weight and value of commercially caught salmon by species, Norton Sound District, 1961–2012.

Year	Pounds Caught (Round Wt. in lb)				Salmon	Value of
	Chinook	Coho	Pink	Chum	Roe (lb)	Catch ($)
1961	120,405	96,649	102,711	347,990		[a]
1962 [b]	157,000	[a]	10,569	221,645		105,800
1963 [b]	89,700	51,750	[a]	[a]		104,000
1964 [b]	39,169	686	[a]	249,890		51,000
1965	33,327	14,210	660	264,924	[a]	21,483
1966	35,259	40,285	38,334	577,764	16,901	68,000
1967	41,854	15,944	100,913	289,473	21,429	44,038
1968 [c]	22,954	50,665	250,044	306,871	20,381	63,700
1969 [d]	51,441	50,461	312,836	529,235	5,578	95,297
1970	38,103	25,000	156,313	610,588	1,345	99,019
1971	43,112	22,078	15,377	857,014	1,122	101,000
1972	57,675	3,257	133,389	710,853	1,083	102,225
1973	38,935	63,812	185,799	845,596	[a]	308,740
1974	54,433	15,023	511,737	1,082,575	39,876	437,127
1975	25,964	32,345	87,586	1,318,111	46,470	413,255
1976	34,095	49,822	271,867	669,728	[a]	285,283
1977	102,341	28,044	162,457	1,415,981	[a]	546,010
1978	222,974	50,872	1,164,174	1,389,806	[a]	907,330
1979	231,988	251,129	598,785	1,001,548	[a]	878,792
1980	135,646	204,498	719,368	1,301,693	[a]	572,125
1981	164,182	212,065	719,102	1,284,193	[a]	761,658
1982	97,255	648,212	659,171	1,338,788	95	1,069,723
1983	179,666	360,264	274,568	2,352,104	239	946,232
1984	169,104	523,310	343,685	1,020,635	0	738,064
1985	419,331	169,413	11,458	939,885	0	818,477
1986	133,161	247,333	133,319	1,011,824	0	546,452
1987	141,494	177,569	6,691	731,597	0	517,894
1988	67,148	280,658	226,966	767,168	0	760,641
1989	104,829	336,652	439	297,156	0	319,489
1990	168,745	426,902	[b]	482,060	75	474,064
1991	107,541	469,495	[b]	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

-continued-

Year	Pounds Caught (Round Wt. in lb)				Salmon	Value of
	Chinook	Coho	Pink	Chum	Roe (lb)	Catch ($)
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

[a] Information not available.

[b] Does not include canned salmon cases (48#). 1962: 29 Chinook, 883 coho, 927 pink, and 12,459 chum salmon. 1963: 604 Chinook, 808 coho, 1,918 pink, and 13,308 chum salmon. 1964: 75 Chinook, 452 pink, and 9,357 chum salmon.

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

[d] Includes about 598 lb of salted Chinook, about 48,092 lb of salted pink, and about 117,664 lb of salted chum salmon.

Appendix A4.–Estimated mean prices paid to commercial salmon fishermen in dollars, Norton Sound District, 1962–2012.

Year	Chinook	Coho	Pink	Chum	Sockeye
		Price Per Fish			
1962	3.85	0.60	0.25	0.35	
1963	3.85	0.60	0.25	0.35	
1964	4.50		0.25	0.40	
1965	3.75	0.45		0.40	
1966	4.80	1.05	0.25	0.65	
		Price Per Pound			
1967	0.20	0.14	0.07	0.09	
1968	0.25	0.14	0.06	0.10	
1969	0.22	0.14	0.06	0.11	
1970	0.25	0.14	0.06	0.10	
1971	0.25	0.14	0.07	0.10	
1972	0.27	0.16	0.06	0.11	
1973	0.40	0.16	0.07	0.32	
1974	0.40	0.16	0.13	0.32	
1975	0.40	0.16	0.13	0.24	
1976	0.50	0.32	0.17	0.30	
1977	0.65	0.40	0.16	0.30	
1978	0.65	0.35	0.20	0.30	
1979	0.88	0.66	0.16	0.41	
1980	0.74	0.63	0.07	0.23	
1981	1.25	0.62	0.13	0.26	
1982	1.25	0.57	0.12	0.32	
1983	1.13	0.39	0.11	0.28	
1984	1.20	0.45	0.11	0.24	
1985	1.08	0.48	0.20	0.31	
1986	0.88	0.52	0.15	0.27	
1987	1.11	0.57	0.20	0.33	
1988	1.26	1.13	0.19	0.39	
1989	0.73	0.43	0.10	0.18	
1990	1.01	0.50	(0.75 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	
Avg 2007-11	1.64	1.08	0.22	0.44	0.62

-continued-

Appendix A4.–Page 2 of 2.

Year	Chinook	Coho	Pink	Chum	Sockeye
	Price Per Pound				
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
Avg 2007-11	1.64	1.08	0.22	0.44	0.62

Note: Blank cells indicate no known purchases were made.

Appendix A5.–Mean commercial salmon harvest weights, Norton Sound District, 1964–2012.

Year	Mean Round Weight in Pounds [a]			
	Chinook	Coho	Pink	Chum
1964	NA	NA	NA	7.0
1965	NA	NA	2.3	7.1
1966	NA	NA	3.5	7.8
1967	23.7	7.0	3.6	7.2
1968	20.0	7.0	4.0	7.5
1969	19.3	7.5	3.6	6.4
1970	20.0	7.0	3.5	7.8
1971	23.7	7.0	3.6	7.2
1972	20.0	7.3	2.8	6.9
1973	20.3	6.8	3.9	7.1
1974	18.2	6.7	3.4	6.6
1975	10.8	7.4	2.9	6.5
1976	15.2	7.2	3.1	7.0
1977	22.7	7.6	3.3	7.0
1978	22.8	6.9	3.6	7.4
1979	22.9	7.1	3.6	7.2
1980	21.5	6.8	3.2	7.2
1981	20.7	6.7	3.5	7.6
1982	16.5	7.1	2.9	7.3
1983	17.4	7.2	3.6	7.4
1984	20.0	7.7	2.9	7.0
1985	21.5	7.7	3.1	7.0
1986	20.8	6.9	3.2	6.9
1987	20.0	7.3	3.0	7.1
1988	16.4	7.5	3.0	7.1
1989	18.4	7.6	3.6	7.0
1990	19.0	7.5	NA	7.4
1991	17.7	7.4	NA	6.9
1992 [b]	12.7	7.8	[c]	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

[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, 1964–2012.

	Nome (Subdistrict 1)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1964	5	0	0	1	1,194	1,200	0	0	0	0	0	0	5	0	0	1	1,194	1,200
1965	1	0	0	193	1,941	2,135	0	0	0	780	1,825	2,605	1	0	0	973	3,766	4,740
1966	1	0	32	1	581	615	12	0	0	1,794	1,762	3,568	13	0	32	1,795	2,343	4,183
1967	0	0	0	72	406	478	11	0	0	349	627	987	11	0	0	421	1,033	1,465
1968[a]	0	0	0	50	102	152	7	0	0	6,507	621	7,135	7	0	0	6,557	723	7,287
1969	0	0	63	330	601	994	2	0	0	3,649	508	4,159	2	0	63	3,979	1,109	5,153
1970	0	0	6	55	960	1,021	0	0	35	5,001	458	5,494	0	0	41	5,056	1,418	6,515
1971	11	0	0	14	2,315	2,340	0	0	122	5,457	2,900	8,479	11	0	122	5,471	5,215	10,819
1972	15	0	0	12	2,643	2,670	19	0	52	4,684	315	5,070	34	0	52	4,696	2,958	7,740
1973	0	0	0	321	1,132	1,453	14	0	120	5,108	1,863	7,105	14	0	120	5,429	2,995	8,558
1974	19	0	123	7,722	10,431	18,295	8	0	5	3,818	183	4,014	27	0	128	11,540	10,614	22,309
1975.[b]	2	0	319	2,163	8,364	10,848	2	0	97	6,267	2,858	9,224	4	0	416	8,430	11,222	20,072
1976	2	10	26	1,331	7,620	8,989	13	0	189	5,492	1,705	7,399	15	10	215	6,823	9,325	16,388
1977	8	0	58	65	15,998	16,129	35	0	498	2,773	12,192	15,498	43	0	556	2,838	28,190	31,627
1978	19	0	0	22,869	8,782	31,670	35	0	225	13,063	4,295	17,618	54	0	225	35,932	13,077	49,288
1979	9	0	29	5,860	5,391	11,289	11	0	1,120	6,353	3,273	10,757	20	0	1,149	12,213	8,664	22,046
1980	8	0	0	10,007	13,922	23,937	129	0	2,157	22,246	5,983	30,515	137	0	2,157	32,253	19,905	54,452
1981	4	0	508	3,202	18,666	22,380	35	14	1,726	5,584	8,579	15,938	39	14	2,234	8,786	27,245	38,318
1982	20	0	1,183	18,512	13,447	33,162	21	6	1,829	19,202	4,831	25,889	41	6	3,012	37,714	18,278	59,051
1983	23	0	261	308	11,691	12,283	74	53	1,911	8,086	7,091	17,215	97	53	2,172	8,394	18,782	29,498
1984	7	0	820	0	3,744	4,571	83	16	1,795	17,182	4,883	23,959	90	16	2,615	17,182	8,627	28,530
1985	21	0	356	0	6,219	6,596	56	114	1,054	2,117	5,667	9,008	77	114	1,410	2,117	11,886	15,604
1986	6	0	50	0	8,160	8,216	150	107	688	8,720	8,085	17,750	156	107	738	8,720	16,245	25,966
1987	3	0	577	0	5,646	6,226	200	107	1,100	1,251	8,394	11,052	203	107	1,677	1,251	14,040	17,278
1988	2	0	54	182	1,628	1,866	63	133	1,076	2,159	5,952	9,383	65	133	1,130	2,341	7,580	11,249
1989	2	0	0	123	492	617	24	131	469	924	3,399	4,947	26	131	469	1,047	3,891	5,564
1990	0	0	0	0	0	0	58	234	510	2,233	4,246	7,281	58	234	510	2,233	4,246	7,281
5-year avg.[c]	0	0	0	0	0	0	29	122	1,774	4,320	1,723	7,969	29	122	1,774	4,320	1,723	7,969
10-year avg.[d]	0	0	0	0	0	0	40	121	1,661	5,472	1,267	8,561	40	121	1,661	5,472	1,267	8,561

-continued-

	Nome (Subdistrict 1)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
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[e]	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[f]	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	6,251	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
5-year avg.[c]	0	0	0	0	0	0	29	122	1,774	4,320	1,723	7,969	29	122	1,774	4,320	1,723	7,969
10-year avg.[d]	0	0	0	0	0	0	40	121	1,661	5,472	1,267	8,551	40	121	1,661	5,472	1,267	8,551

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

[a] Beginning in 1968, a subsistence permit was required for Sinuk, Snake, Nome and Solomon rivers. Previous subsistence harvests were estimated by a limited survey of fishermen.

[b] Beginning in 1975, a subsistence permit was required for the entire subdistrict.

[c] 2007–2011.

[d] 2002–2011.

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

[f] Beginning in 2006, Tier II chum salmon fishing restrictions were suspended.

Appendix A7.–Commercial and subsistence salmon catch by species, by year in Golovin Subdistrict, Norton Sound District, 1962–2012.

	Golovin (Subdistrict 2)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	45	11	264	10,276	68,720	79,316	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1963	40	40	0	19,677	49,850	69,607	0	0	118	5,702	9,319	15,139	40	40	118	25,379	59,169	84,746
1964	27	40	3	7,236	58,301	65,607	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1965	0	0	0	0	0	0	2	0	49	1,523	3,847	5,421	2	0	49	1,523	3,847	5,421
1966	17	14	584	4,665	29,791	35,071	4	0	176	1,573	3,520	5,273	21	14	760	6,238	33,311	40,344
1967	10	0	747	5,790	31,193	37,740	3	0	185	2,774	4,803	7,765	13	0	932	8,564	35,996	45,505
1968	12	0	205	18,428	10,011	28,656	4	0	181	4,955	1,744	6,884	16	0	386	23,383	11,755	35,540
1969	28	0	1,224	23,208	20,949	45,409	2	0	190	2,760	2,514	5,466	30	0	1,414	25,968	23,463	50,875
1970	13	0	3	18,721	20,566	39,303	4	0	353	2,046	2,614	5,017	17	0	356	20,767	23,180	44,320
1971	37	0	197	2,735	33,824	36,793	7	0	191	1,544	1,936	3,678	44	0	388	4,279	35,760	40,471
1972	36	0	20	6,562	27,097	33,715	4	0	62	1,735	2,028	3,829	40	0	82	8,297	29,125	37,544
1973	70	0	183	14,145	41,689	56,087	1	0	48	9	74	132	71	0	231	14,154	41,763	56,219
1974	30	0	3	28,340	30,173	58,546	3	0	0	967	205	1,175	33	0	3	29,307	30,378	59,721
1975	17	0	206	10,770	41,761	52,754	0	0	1	2,011	2,025	4,037	17	0	207	12,781	43,786	56,791
1976	12	0	1,311	24,051	30,219	55,593	0	0	0	1,995	1,128	3,123	12	0	1,311	26,046	31,347	58,716
1977	26	0	426	7,928	53,912	62,292	3	0	80	703	2,915	3,701	29	0	506	8,631	56,827	65,993
1978	22	0	94	72,033	41,462	113,611	1	0	0	2,470	1,061	3,532	23	0	94	74,503	42,523	117,143
1979	75	49	1,606	45,948	30,201	77,879	0	0	845	2,546	2,840	6,231	75	49	2,451	48,494	33,041	84,110
1980	36	36	328	10,774	52,609	63,783	12	0	692	10,727	4,057	15,488	48	36	1,020	21,501	56,666	79,271
1981	23	5	13	49,755	58,323	108,119	8	0	1,520	5,158	5,543	12,229	31	5	1,533	54,913	63,866	120,348
1982	78	5	4,281	39,510	51,970	95,844	7	0	1,289	4,752	1,868	7,916	85	5	5,570	44,262	53,838	103,760
1983	52	10	295	17,414	48,283	66,054	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1984	31	0	2,462	88,588	54,153	145,234	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1985	193	113	1,196	3,019	55,781	60,302	12	2	430	1,904	9,577	11,925	205	115	1,626	4,923	65,358	72,227
1986	81	8	958	25,425	69,725	96,197	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1987	166	51	2,203	1,579	44,334	48,333	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1988	108	921	2,149	31,559	33,348	68,085	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1989	0	0	0	0	0	0	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1990	52	21	0	0	15,993	16,066	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
5-year avg. [b]	2	0	1,831	948	7,599	10,381	146	111	1,652	6,639	1,903	10,450	148	111	3,482	7,587	9,503	20,831
10-year avg. [c]	1	0	915	474	3,800	5,190	136	71	1,331	9,871	1,633	13,041	137	71	2,246	10,345	5,433	18,232

-continued-

	Golovin (Subdistrict 2)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
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 [d]	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 [d]	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 [d]	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 [d]	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 [d]	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 [d]	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 [d]	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 [d]	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 [d]	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 [d]	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 [e]	0	0	0	0	0	0	164	6	654	19,936	880	21,640	164	6	654	19,936	880	21,640
2005 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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
5-yr avg. [b]	2	0	1,831	948	7,599	10,381	146	111	1,652	6,639	1,903	10,450	148	111	3,482	7,587	9,503	20,831
10-yr avg. [c]	1	0	915	474	3,800	5,190	136	71	1,331	9,871	1,633	13,041	137	71	2,246	10,345	5,433	18,232

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

[a] Subsistence surveys were not conducted.

[b] 2007–2011.

[c] 2002–2011.

[d] 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.

[e] Beginning in 2004 a permit was required for the subdistrict that replaced household surveys. The permit system helped to record harvest by residents living outside the subdistrict.

Appendix A8.–Commercial and subsistence salmon catch by species, by year in Elim Subdistrict, Norton Sound District, 1962–2012.

	Elim (Subdistrict 3)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	27	0	0	11,100	50,683	61,810	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1963	15	0	0	2,549	46,274	48,838	5	0	0	5,808	8,316	14,129	20	0	0	8,357	54,590	62,967
1964	32	3	0	3,372	28,568	31,975	0	0	0	63	348	411	32	3	0	3,435	28,916	32,386
1965	0	0	0	0	0	0	16	0	72	1,325	9,857	11,270	16	0	72	1,325	9,857	11,270
1966	17	0	0	2,745	24,741	27,503	14	0	250	2,511	5,409	8,184	31	0	250	5,256	30,150	35,687
1967	0	0	0	0	0	0	39	0	116	1,322	9,913	11,390	39	0	116	1,322	9,913	11,390
1968	12	0	1	9,012	17,908	26,933	2	0	80	6,135	2,527	8,744	14	0	81	15,147	20,435	35,677
1969	29	0	0	11,807	26,594	38,430	9	0	109	1,790	1,303	3,211	38	0	109	13,597	27,897	41,641
1970	39	0	0	13,052	29,726	42,817	16	0	160	4,661	6,960	11,797	55	0	160	17,713	36,686	54,614
1971	95	0	4	922	43,831	44,852	16	0	271	1,046	2,227	3,560	111	0	275	1,968	46,058	48,412
1972	190	0	11	5,866	30,919	36,986	44	0	108	1,579	2,070	3,801	234	0	119	7,445	32,989	40,787
1973	134	0	0	10,603	31,389	42,126	2	0	0	0	298	300	136	0	0	10,603	31,687	42,426
1974	198	0	9	12,821	55,276	68,304	3	0	0	2,382	1,723	4,108	201	0	9	15,203	56,999	72,412
1975	16	0	0	4,407	46,699	51,122	2	0	6	1,280	508	1,796	18	0	6	5,687	47,207	52,918
1976	24	0	232	5,072	10,890	16,218	22	0	0	5,016	1,548	6,586	46	0	232	10,088	12,438	22,804
1977	96	0	6	9,443	47,455	57,000	22	0	225	1,145	1,170	2,562	118	0	231	10,588	48,625	59,562
1978	444	0	244	39,694	44,595	84,977	38	0	407	1,995	1,229	3,669	482	0	651	41,689	45,824	88,646
1979	1,035	0	177	40,811	37,123	79,146	16	0	890	6,078	1,195	8,179	1,051	0	1,067	46,889	38,318	87,325
1980	502	0	0	1,435	14,755	16,692	131	0	229	4,232	1,393	5,985	633	0	229	5,667	16,148	22,677
1981	198	0	5	26,417	29,325	55,945	32	0	2,345	6,530	2,819	11,726	230	0	2,350	32,947	32,144	67,671
1982	253	0	318	9,849	40,030	50,450	1	0	1,835	3,785	3,537	9,158	254	0	2,153	13,634	43,567	59,608
1983	254	0	0	17,027	65,776	83,057	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1984	0	0	5,959	28,035	9,477	43,471	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1985	816	32	1,803	559	24,466	27,676	67	-	1,389	1,212	947	3,615	883	-	3,192	1,771	25,413	31,291
1986	600	41	5,874	15,795	20,668	42,978	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1987	907	15	64	568	17,278	18,832	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1988	663	93	3,974	13,703	18,585	37,018	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1989	62	0	0	0	167	229	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1990	202	0	0	501	3,723	4,426	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
5-year avg. [b]	4	4	7,722	5,608	10,490	23,828	266	5	1,980	3,891	2,363	8,504	270	8	9,702	9,499	12,853	32,329
10-year avg. [c]	2	2	3,861	2,804	5,245	11,914	337	10	1,633	4,712	1,750	8,442	339	12	5,494	7,516	6,995	20,356

-continued-

Elim (Subdistrict 3)

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1991 [d]	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 [d]	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 [d]	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 [d]	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 [d]	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 [d]	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 [d]	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 [d]	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 [d]	0	0	0	0	0	0	424	13	975	1,564	744	3,720	424	13	975	1,564	744	3,720
2000 [d]	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 [d]	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 [d]	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 [d]	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 [e]	0	0	0	0	0	0	412	0	704	7,858	683	9,657	412	0	704	7,858	683	9,657
2005 [e]	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 [e]	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 [e]	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 [e]	5	0	4,602	14,536	304	19,431	269	0	1,804	7,655	1,284	11,012	274	0	6,406	22,191	1,588	30,459
2009 [e]	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 [e]	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 [e]	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 [e]	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
5-year avg. [b]	4	4	7,722	5,608	10,490	23,828	266	5	1,980	3,891	2,363	8,504	270	8	9,702	9,499	12,853	32,332
10-year avg. [c]	2	2	3,861	2,804	5,245	11,914	337	10	1,633	4,712	1,750	8,442	339	12	5,494	7,516	6,995	20,356

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

[a] Subsistence surveys were not conducted.

[b] 2007–2011.

[c] 2002–2011.

[d] 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.

[e] Beginning in 2004 a permit was required for the subdistrict that replaced household surveys. The permit system helped to record harvest by residents outside the subdistrict.

Appendix A9.–Commercial and subsistence salmon catch by species, by year in Norton Bay Subdistrict, Norton Sound District, 1962–2012.

	Norton Bay (Subdistrict 4)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	387	7	40	4,402	24,380	29,216	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1963	137	2	0	17,676	12,469	30,284	0	0	0	5,097	0	5,097	137	2	0	22,773	12,469	35,381
1964	50	3	0	988	5,916	6,957	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1965	0	0	0	0	0	0	4	0	22	252	3,032	3,310	4	0	22	252	3,032	3,310
1966	0	0	0	0	0	0	7	0	41	929	3,612	4,589	7	0	41	929	3,612	4,589
1967	0	0	0	0	0	0	12	0	14	1,097	2,945	4,068	12	0	14	1,097	2,945	4,068
1968	0	0	0	0	0	0	28	0	71	1,916	1,872	3,887	28	0	71	1,916	1,872	3,887
1969	26	0	0	4,849	3,974	8,849	59	0	189	2,115	3,855	6,218	85	0	189	6,964	7,829	15,067
1970	0	0	0	0	0	0	3	0	10	840	3,500	4,353	3	0	10	840	3,500	4,353
1971	0	0	0	0	0	0	5	0	47	92	2,619	2,763	5	0	47	92	2,619	2,763
1972	43	0	0	1,713	7,799	9,555	30	0	44	2,089	2,022	4,185	73	0	44	3,802	9,821	13,740
1973	28	0	0	1,645	4,672	6,345	1	0	0	10	130	141	29	0	0	1,655	4,802	6,486
1974	21	0	0	654	3,826	4,501	0	0	0	17	900	917	21	0	0	671	4,726	5,418
1975	68	0	89	1,137	17,385	18,679	1	0	0	93	361	455	69	0	89	1,230	17,746	19,134
1976	102	0	95	4,456	7,161	11,814	2	0	0	41	236	279	104	0	95	4,497	7,397	12,093
1977	158	0	1	2,495	13,563	16,217	14	0	0	420	2,055	2,489	172	0	1	2,915	15,618	18,706
1978	470	0	144	8,471	21,973	31,058	12	0	21	1,210	1,060	2,303	482	0	165	9,681	23,033	33,361
1979	856	0	2,547	6,201	15,599	25,203	12	0	697	735	1,400	2,844	868	0	3,244	6,936	16,999	28,047
1980	340	0	0	47	7,855	8,242	22	0	33	4,275	1,132	5,462	362	0	33	4,322	8,987	13,704
1981	63	0	0	177	3,111	3,351	7	0	82	2,314	3,515	5,918	70	0	82	2,491	6,626	9,269
1982	96	0	2,332	2,535	7,128	12,091	1	0	484	2,600	2,485	5,570	97	0	2,816	5,135	9,613	17,661
1983	215	0	204	3,935	17,157	21,511	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1984	0	0	0	1,162	3,442	4,604	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1985	528	0	384	68	9,948	10,928	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1986	139	2	1,512	40	1,994	3,687	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1987	544	0	145	16	3,586	4,291	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1988	434	2	709	1,749	7,521	10,415	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1989	0	0	0	0	0	0	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1990	0	0	0	0	0	0	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
4-year avg.[b]	3	4	2,189	1,260	3,981	7,436	257	7	746	2,811	3,306	7,126	200	148	3,081	4,670	7,766	13,201

-continued-

Norton Bay (Subdistrict 4)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
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 [c]	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 [c]	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 [c]	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 [c]	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 [c]	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 [c]	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 [c]	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 [c]	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 [c]	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 [c]	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
4-year avg. [b]	3	4	2,189	1,260	3,981	7,436	257	7	746	2,811	3,306	7,126	200	148	3,081	4,670	7,766	13,201

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

[a] Subsistence surveys were not conducted.

[b] 2008–2011.

[c] 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.

Appendix A10.–Commercial and subsistence salmon catch by species, by year in Shaktoolik Subdistrict, Norton Sound District, 1961–2012.

	Shaktoolik (Subdistrict 5)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	140	0	0	29,075	24,746	53,961	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1962	1,738	0	2,113	640	8,718	13,209	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1963	480	11	563	5,138	19,153	25,345	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1964	631	79	16	1,969	35,272	37,967	77	0	340	2,132	5,412	7,961	708	79	356	4,101	40,684	45,928
1965	127	30	0	3	8,356	8,516	31	0	107	3,763	3,420	7,321	158	30	107	3,766	11,776	15,837
1966	310	0	956	344	8,292	9,902	142	0	762	1,445	4,183	6,532	452	0	1,718	1,789	12,475	16,434
1967	43	0	88	1,050	1,655	2,836	262	0	387	2,010	4,436	7,095	305	0	475	3,060	6,091	9,931
1968	61	0	130	2,205	2,504	4,900	10	0	458	6,355	1,915	8,738	71	0	588	8,560	4,419	13,638
1969	33	0	276	6,197	8,645	15,151	40	0	193	4,018	3,439	7,690	73	0	469	10,215	12,084	22,841
1970	197	0	155	2,301	15,753	18,406	43	0	210	2,474	2,016	4,743	240	0	365	4,775	17,769	23,149
1971	284	0	238	28	13,399	13,949	87	0	329	494	5,060	5,970	371	0	567	522	18,459	19,919
1972	419	0	11	2,798	12,022	15,250	64	0	235	939	3,399	4,637	483	0	246	3,737	15,421	19,887
1973	289	0	177	6,450	14,500	21,416	51	0	130	3,410	1,397	4,988	340	0	307	9,860	15,897	26,404
1974	583	0	179	5,650	26,391	32,803	93	0	353	1,901	358	2,705	676	0	532	7,551	26,749	35,508
1975	651	2	812	1,774	49,536	52,775	18	0	14	1,394	334	1,760	669	2	826	3,168	49,870	54,535
1976	892	0	129	15,803	15,798	32,622	24	0	121	1,188	269	1,602	916	0	250	16,991	16,067	34,224
1977	1,521	4	418	7,743	36,591	46,277	49	0	170	585	2,190	2,994	1,570	4	588	8,328	38,781	49,271
1978	1,339	7	1,116	46,236	35,388	84,086	81	0	15	3,275	1,170	4,541	1,420	7	1,131	49,511	36,558	88,627
1979	2,377	0	3,383	18,944	22,030	46,734	62	0	1,605	2,575	1,670	5,912	2,439	0	4,988	21,519	23,700	52,646
1980	1,086	0	8,001	1,947	27,453	38,487	57	0	756	3,227	1,827	5,867	1,143	0-	8,757	5,174	29,280	44,354
1981	1,484	4	1,191	29,695	21,097	53,471	8	0	525	2,225	3,490	6,248	1,492	4	1,716	31,920	24,587	59,719
1982	1,677	3	22,233	17,019	26,240	67,172	68	0	2,138	3,865	1,165	7,236	1,745	3	24,371	20,884	27,405	74,408
1983	2,742	4	12,877	12,031	67,310	94,964	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1984	1,613	0	10,730	1,596	32,309	46,248	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1985	5,312	0	2,808	0	13,403	21,523	298	-	1,379	24	298	1,999	5,610	-	4,187	24	13,701	23,522
1986	1,075	29	6,626	0	16,126	23,856	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1987	2,214	0	6,193	0	14,088	22,495	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1988	671	79	6,096	3,681	21,521	32,048	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1989	1,241	43	8,066	0	19,641	28,991	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1990	2,644	49	4,695	0	21,748	29,136	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
5-year avg. [b]	13	29	21,947	3,603	17,786	43,378	383	60	1,654	4,563	642	7,303	396	90	23,600	8,166	18,428	50,681
10-year avg. [c]	13	15	18,147	1,802	9,516	29,492	616	40	1,925	6,810	529	9,921	628	55	20,072	8,612	10,045	39,412

-continued-

Appendix A10.–Page 2 of 2.

Shaktoolik (Subdistrict 5)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
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[d]	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[d]	1,239	5	10,856	37,377	14,775	64,252	1,275	2,480	2,626	7,024	2,480	15,885	2,514	2,485	13,482	44,401	17,255	80,137
1996[d]	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[d]	2,449	0	4,694	-	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[d]	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[d]	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[d]	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[d]	90	0	2,664	0	1,813	4,573	936	143	2,090	10,172	1,553	14,894	1,026	143	4,754	10,172	3,366	19,467
2002[d]	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[d]	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	35,793	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
5-year avg.[b]	13	29	21,947	3,603	17,786	43,378	383	60	1,654	4,563	642	7,303	396	90	23,600	8,166	18,428	50,681
10-year avg.[c]	13	15	18,147	1,802	9,516	29,492	616	40	1,925	6,810	529	9,921	628	55	20,072	8,612	10,045	39,412

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

[a] Subsistence surveys were not conducted.

[b] 2007–2011.

[c] 2002–2011.

[d] 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.

Appendix A11.–Commercial and subsistence salmon catch by species, by year in Unalakleet Subdistrict, Norton Sound District, 1961–2012.

	Unalakleet (Subdistrict 6)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,160	35	13,807	5,162	23,586	47,750	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
1962	5,089	0	6,739	6,769	30,283	48,880	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
1963	5,941	18	16,202	1,140	27,003	50,304	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
1964	1,273	1	79	1	19,611	20,965	488	0	2,227	7,030	6,726	16,471	1,761	1	2,306	7,031	26,337	37,436
1965	1,321	0	2,030	24	26,498	29,873	521	0	4,562	11,488	8,791	25,362	1,842	0	6,592	11,512	35,289	55,235
1966 [a]	1,208	0	4,183	5,023	16,840	27,254	90	0	789	6,083	3,387	10,349	1,298	0	4,972	11,106	20,227	37,603
1967 [a]	1,751	0	1,544	21,961	8,502	33,758	490	0	484	9,964	-	10,938	2,241	0	2,028	31,925	-	44,696
1968 [a]	960	0	6,549	41,474	14,865	63,848	186	0	1,493	11,044	2,982	15,705	1,146	0	8,042	52,518	17,847	79,553
1969 [a]	2,276	0	5,273	40,558	22,032	70,139	324	0	1,483	4,230	4,196	10,233	2,600	0	6,756	44,788	26,228	80,372
1970 [a]	1,604	0	4,261	30,779	40,029	76,673	495	0	3,907	10,104	7,214	21,720	2,099	0	8,168	40,883	47,243	98,393
1971 [a]	2,166	0	2,688	1,196	37,543	43,593	911	0	3,137	2,230	7,073	13,351	3,077	0	5,825	3,426	44,616	56,944
1972 [a]	2,235	0	412	28,231	20,440	51,318	643	0	1,818	3,132	4,132	9,725	2,878	0	2,230	31,363	24,572	61,043
1973	1,397	0	8,922	13,335	25,716	49,370	323	0	213	6,233	3,426	10,195	1,720	0	9,135	19,568	29,142	59,565
1974	2,100	0	1,778	93,332	36,170	133,380	313	0	706	7,341	588	8,948	2,413	0	2,484	100,673	36,758	142,328
1975	1,638	0	3,167	12,137	48,740	65,682	163	0	74	4,758	2,038	7,033	1,801	0	3,241	16,895	50,778	72,715
1976	1,211	1	5,141	37,203	24,268	67,824	142	0	694	4,316	2,832	7,984	1,353	1	5,835	41,519	27,100	75,808
1977	2,691	1	2,781	21,001	32,936	59,410	723	0	1,557	8,870	6,085	17,235	3,414	1	4,338	29,871	39,021	76,645
1978	7,525	5	5,737	136,200	37,079	186,546	1,044	0	2,538	13,268	3,442	20,292	8,569	5	8,275	149,468	40,521	206,838
1979	6,354	8	23,696	49,647	30,445	110,150	640	0	3,330	6,960	1,597	12,527	6,994	8	27,026	56,607	32,042	122,677
1980	4,339	3	21,512	203,142	64,198	293,194	1,046	0	4,758	19,071	5,230	30,105	5,385	3	26,270	222,213	69,428	323,299
1981	6,157	47	29,845	123,233	39,186	198,468	869	24	5,808	5,750	4,235	16,686	7,026	71	35,653	128,983	43,421	215,154
1982	3,768	2	61,343	142,856	44,520	252,489	913	2	7,037	20,045	4,694	32,691	4,681	4	68,380	162,901	49,214	285,180
1983	7,022	13	36,098	26,198	109,220	178,551	1,868	33	6,888	13,808	4,401	26,998	8,890	46	42,986	40,006	113,621	205,549
1984	6,804	6	47,904	0	43,317	98,031	1,650	1	6,675	17,418	3,348	29,092	8,454	7	54,579	17,418	46,665	127,123
1985	12,621	21	15,421	1	25,111	53,175	1,397	3	2,244	55	1,968	5,667	14,018	24	17,665	56	27,079	58,842
1986	4,494	153	20,580	0	30,239	55,466	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
1987	3,246	141	15,097	97	17,525	36,106	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
1988	2,218	157	24,232	23,730	25,363	75,700	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
1989	4,402	222	36,025	0	20,825	61,474	[b]	[b]	4,681	17,500	1,388	[b]	[b]	[b]	40,706	17,500	22,213	[b]
1990	5,998	358	52,015	0	23,659	82,030	2,476	[b]	[b]	[b]	[b]	[b]	8,474	[b]	[b]	[b]	[b]	[b]
5-year avg. [c]	81	95	57,646	15,904	22,935	96,661	1,365	223	5,300	10,621	2,809	20,318	1,446	318	62,946	26,525	25,744	116,979
10-year avg. [d]	56	56	49,366	7,952	13,293	70,722	1,934	309	6,212	16,155	2,723	27,333	1,989	365	55,579	24,107	16,016	98,055

-continued-

Unalakleet (Subdistrict 6)

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1991	4,534	147	52,033	-	39,609	96,323	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
1992	3,409	229	84,449	6,284	52,547	146,918	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
1993	5,944	251	26,290	42,061	28,156	102,702	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
1994 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	10	21	13,029	0	3,075	16,112	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	34,246	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	105,071	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	102,321	1,665	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	143,674	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
5-year avg. [c]	81	95	57,646	15,904	22,935	96,661	1,365	223	5,300	10,621	2,809	20,318	1,446	318	62,946	26,525	25,744	116,979
10-year avg. [d]	56	56	49,366	7,952	13,293	70,722	1,934	309	6,212	16,155	2,723	27,333	1,989	365	55,579	24,107	16,016	98,055

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

[a] Subsistence catches from 1966–1972 includes fish taken at St. Michael.

[b] Subsistence surveys were not conducted.

[c] 2007-2011.

[d] 2002-2011.

[e] 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.

Appendix A12.–Subsistence salmon catch by species and year for St. Michael and Stebbins in Norton Sound District, 1994–2012.

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
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

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, 1961–2012.

	Subdistrict 1–6																	
	Commercial						Subsistence						Sport fish					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,300	35	13,807	34,237	48,332	101,711	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1962	7,286	18	9,156	33,187	182,784	232,431	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1963	6,613	71	16,765	46,180	154,749	224,378	5	ND	118	16,607	17,635	34,365	ND	ND	ND	ND	ND	ND
1964	2,018	126	98	13,567	148,862	164,671	565	ND	2,567	9,225	12,486	24,843	ND	ND	ND	ND	ND	ND
1965	128	30	2,030	220	36,795	39,203	574	ND	4,812	19,131	30,772	55,289	ND	ND	ND	ND	ND	ND
1966	1,553	14	5,755	12,778	80,245	100,345	269	ND	2,210	14,335	21,873	38,687	ND	ND	ND	ND	ND	ND
1967	1,804	0	2,379	28,879	41,756	74,818	817	ND	1,222	17,516	22,724	42,279	ND	ND	ND	ND	ND	ND
1968	1,045	0	6,885	71,179	45,300	124,409	237	ND	2,391	36,912	11,661	51,201	ND	ND	ND	ND	ND	ND
1969	2,392	0	6,836	86,949	82,795	178,972	436	ND	2,191	18,562	15,615	36,804	ND	ND	ND	ND	ND	ND
1970	1,853	0	4,423	64,908	107,034	178,218	561	ND	4,675	26,127	22,763	54,126	ND	ND	ND	ND	ND	ND
1971	2,593	0	3,127	4,895	131,362	141,977	1,026	197	4,097	10,863	21,618	37,801	ND	ND	ND	ND	ND	ND
1972	2,938	0	454	45,182	100,920	149,494	804	93	2,319	14,158	13,873	31,247	ND	ND	ND	ND	ND	ND
1973	1,918	0	9,282	46,499	119,098	176,797	392	ND	520	14,770	7,185	22,867	ND	ND	ND	ND	ND	ND
1974	2,951	0	2,092	148,519	162,267	315,829	420	ND	1,064	16,426	3,958	21,868	ND	ND	ND	ND	ND	ND
1975	2,393	2	4,593	32,388	212,485	251,861	186	11	192	15,803	8,113	24,305	ND	ND	ND	ND	ND	ND
1976	2,243	11	6,934	87,919	95,956	193,063	203	ND	1,004	18,048	7,718	26,973	ND	ND	ND	ND	ND	ND
1977	4,500	5	3,690	48,675	200,455	257,325	846	ND	2,530	14,296	26,607	44,279	197	0	449	2,402	670	3,718
1978	9,819	12	7,335	325,503	189,279	531,948	1,211	ND	2,981	35,281	12,257	51,730	303	0	742	7,399	546	8,990
1979	10,706	57	31,438	167,411	140,789	350,401	747	ND	8,487	25,247	11,975	46,456	ND	ND	ND	ND	ND	ND
1980	6,311	40	29,842	227,352	180,792	444,337	1,397	ND	8,625	63,778	19,622	93,422	52	0	1,455	7,732	1,601	10,840
1981	7,929	56	31,562	232,479	169,708	441,734	2,021	38	13,416	28,741	32,866	77,082	70	0	1,504	3,101	1,889	6,564
1982	5,892	10	91,690	230,281	183,335	511,208	1,011	8	14,612	54,249	18,580	88,460	409	0	2,986	13,742	2,620	19,757
1983 [a]	10,308	27	49,735	76,913	319,437	456,420	1,942	86	8,799	21,894	11,492	44,213	687	0	3,823	4,583	2,042	11,135
1984 [a]	8,455	6	67,875	119,381	146,442	342,159	1,733	17	8,470	34,600	8,231	53,051	247	351	7,582	8,322	1,481	17,983
1985 [a]	19,491	166	21,968	3,647	134,928	180,200	1,830	119	6,496	5,312	18,457	32,214	239	20	1,177	1,138	1,036	3,610
1986 [a]	6,395	233	35,600	41,260	146,912	230,400	150	107	688	8,720	8,085	17,750	1,077	19	3,926	3,172	1,719	9,913
1987 [a]	7,080	207	24,279	2,260	102,457	136,283	200	107	1,100	1,251	8,394	11,052	615	924	2,319	1,304	814	5,976
1988 [a]	4,096	1,252	37,214	74,604	107,966	225,132	63	133	1,076	2,159	5,952	9,383	400	782	5,038	2,912	1,583	10,715
1989 [a]	5,707	265	44,091	123	42,625	92,811	24	131	5,150	18,424	4,787	4,947	203	165	4,158	3,564	1,497	9,587
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
5-year avg. [b]	102	132	90,896	27,071	61,995	180,197	2,395	527	12,956	32,283	12,085	60,245	225	27	6,611	2,558	222	9,644
10-year avg. [c]	72	74	73,165	13,536	33,446	120,293	3,258	558	13,163	45,167	9,961	72,108	335	113	6,150	3,341	310	10,249

-continued-

Subdistricts 1–6

	Commercial						Subsistence						Sport fish					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
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	5,339	3,316	17,811	37,363	31,707	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	6,104	785	11,600	22,438	12,866	53,793	1,106	30	4,393	1,458	278	7,265
1998	7,429	7	29,623	588,013	16,324	641,396	5,063	307	10,418	24,721	5,036	45,545	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	2,646	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	Sport fish harvest is not yet available.					
5-year avg. [b]	102	132	90,896	27,071	61,995	180,197	2,395	527	12,956	32,283	12,085	60,245	225	27	6,611	2,558	222	9,644
10-year avg. [c]	72	74	73,165	13,536	33,446	120,293	3,258	558	13,163	45,167	9,961	72,102	335	113	6,150	3,341	310	10,249

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

[a] Not all subdistricts were surveyed.

[b] 2007–2011.

[c] 2002–2011.

Appendix A14.–Sport salmon harvest by species, by year for the Unalakleet River, 1990–2012.

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	53	2,493	77	391	3,015
2012	Sport fish harvest is not yet available.				
Avg 2007-2011	215	4,148	131	841	5,336
Avg 2002-2011	268	3,775	176	898	5,118

Appendix A15.–Sport salmon harvest by species, by year for the Fish/Niukluk rivers, 1990–2012.

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	Sport fish harvest is not yet available.				
Avg 2007-2011	6	1,096	56	227	1,384
Avg 2002-2011	20	763	86	213	1,082

Appendix A16.–Sport salmon harvest by species, by year for the Nome River, 1984–2012.

Year	Chinook	Coho	Chum	Pink	Total
1984	13	2,648	325	4,128	7,114
1985	20	209	189	349	767
1986	0	415	76	491	982
1987	0	163	0	235	398
1988	0	1,455	273	528	2,256
1989	19	1,233	495	1,573	3,320
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	Sport fish harvest is not yet available.				
Avg 2007-2011	3	698	0	1,067	1,767
Avg 2002-2011	1	781	0	1,264	2,047

Appendix A17.–Comparative salmon aerial survey escapement indices of Norton Sound streams unless noted otherwise, 1961–2012.

	Sinuk River				Nome River			
Year [a]	Chinook	Chum	Pink	Coho	Chinook	Chum	Pink	Coho
1963					–	126	3,719	–
1965					–	294	–	–
1971					–	75	7,765	–
1972					–	710	14,960	–
1973					6	1,760	14,940	–
1974		463	7,766	–	–	854	17,832	–
1975	–	4,662	5,390	–	1	2,161	3,405	–
1976	–							
1977	–	5,207	1,302	–	5	3,046	1,726	–
1978	–	8,756	22,435	–	2	5,242	34,900	–
1979			100					
1980	3	2,022	199,000	1,002	5	7,745	171,350	1,145
1981	–	5,579	350	–	15	1,195	12,565	–
1982	–	638	148,800	–	–	700	327,570	–
1983	48	2,150	10,770	96	2	198	9,170	365
1984	7 [b]	493 [b]	284,400 [b]	192	1	2,084 [b]	178,870	839
1985	4	1,910	8,860	33	7	1,967	2,250	242
1986	4	1,960	28,690	–	2	1,150	13,580	–
1987	5	4,540	30	230	3	1,646	1,400 [b]	419
1988	3	2,070	4,652 [c]	563	3	973	2,490l	1,108 [b]
1989	–	1,025	31,310	75	2	72	1,365	375
1990	–	95	29,040	161	–	541	13,085	377
1991	3	5,420	14,680	701	11	3,520	4,690	611
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	–	3,110	1,250	290	–	1,865	182	517
1996	5	1,815	74,100	367	1	799	34,520	723
1997	–	2,975	1,200	57	4	956	65	544
1998	–	630	372,850	322	3	335	179,680	515
1999	–	1,697	180	217	–	375	345	620
2000	–	10	12,608	912	–	658	6,380	1,032
2001	–	3,746	115 [d]	750	–	946 [d]	790 [d]	1,307 [d]
2002	–	1,682	28,487	1,290 [d]	–	127 [d]	295 [d]	1,796
2003	–	677	9,885	190	8	337	2,841	604
2004	–	100 [d]	1,267,100 [d]	2,085	–	3 [d]	707,350 [d]	1,687
2005	–	1,072 [d]	211,000 [d]	2,045	2 [d]	2,082 [d]	212,000 [d]	3,541
2006	0 [d]	1,115 [d]	515,000 [d]	2,147	0 [d]	394 [d]	441,550 [d]	3,650
2007	3 [d]	7,210 [d]	6,810 [d]	668	4 [d]	1,449 [d]	3,378 [d]	1,442
2008	–	–	1,496,000 [d]	1,633	–	106 [d]	528,000 [d]	2,051
2009	0 [d]	344 [d]	6,730 [d]	508 [d]	–	–	–	877 [d]
2010	0 [d]	3,955 [d]	168,600 [d]	5,507 [d]	0 [d]	2,998 [d]	98,272 [d]	0 [d]
2011	0 [d]	6,265 [d]	21,100 [d]	479 [d]	0 [d]	1,317 [d]	9,575 [d]	870 [d]
2012	0 [d]	3,650 [d]	506,500 [d]	–	–	–	–	–

-continued-

Appendix A17.–Page 2 of 5.

	Flambeau River					Eldorado River			
Year [a]	Chinook	Chum	Pink	Pink & Chum [e]	Coho	Chinook	Chum	Pink	Coho
1961	–	400	80	–					
1963						–	400	2,000	–
1967	–	190	–	–	–				
1968	–	197	1,505	–	–				
1969	–	375	1,994	–	–				
1970	–	1,275	10	–	–				
1971	–	7,110	–	–	–				
1972	–	283	291	–	–				
1973	–	–	–	29,190	–				
1974	–	12,031	2,710	–	–	13	2,143	6,185	–
1975	1	5,097	25,001	–	–				
1976	2	1,195	200	–	–	–	328	1,340	–
1977	1	3,150 [d]	20,200 [d]	–	–	–	1,835	125	–
1978	–	3,215	260	–	–	–	10,125	12,800	–
1979	2	3,075	300	–	–	–	326	652	–
1980	0	115	0	–	–	6	9,900	55,520	56
1981	3	765	10	–	–	–	15,605	495	–
1982	–	–	–	–	–	2	1,095	163,300	–
1983	–	–	–	–	–	11	994	270	100
1984	2	1,607	570	–	–	14 [f]	4,362 [d, f]	1,924,935 [d, f]	261
1985	–	606	180	–	–	8	6,090	150	67
1986	4	1,590	–	–	–	9	3,490	18,200	–
1987	1	4,960	290	–	–	6	3,860	130	108
1988	–	7,205	350	–	68	17	2,645	1,045	78
1989	–	5,390	–	–	–	–	350	1,550	87
1990	–	905	–	–	96	17	884	2,050	44
1991	–	2,828	7,180	–	–	76	5,755	1,590	98
1992	–	55	–	–	42	2	4,887	6,615	113
1993	–	819	640	–	11	38	2,895	120	111
1994	–	3,612	4	–	213	–	5,140	53,890	242
1995	–	1,876	1,102	–	186	4	9,025	50	247
1996	–	647	355	–	71	21	20,710	40,100	254
1997	–	2,250 [d]	200 [d]	–	751	40	5,967	10	37
1998	–	2,828	7,180	–	–	–	3,000	123,950	71
1999	–	55	–	–	42	2	1,741	6	45
2000	–	819	640	–	11	2	3,383	16,080	24
2001	–	3,612	4	–	213	2	4,450	8	232
2002	–	1,876	1,102	–	186	8	139	58,700	463
2003	–	647	355	–	71	12	1,257	821	71
2004	–	2,550 [d]	200 [d]	–	751	–	109 [d]	52,000 [d]	755
2005	–	2,261 [d]	100 [d]	–	154	2 [d]	5,445 [d]	2,050 [d]	376
2006	0 [d]	16,000 [d]	8,800 [d]	0	0	0 [d]	2,355 [d]	156,500 [d]	523
2007	1 [d]	4,452 [d]	0 [d]	0	38	2 [d]	6,315 [d]	318 [d]	34
2008	0 [d]	4,235 [d]	106,200 [d]	0	918	–	–	–	–
2009	0 [d]	860 [d]	1,598 [d]	–	627 [d]	14 [d]	1,069 [d]	210 [d]	301 [d]
2010	0 [d]	13,600 [d]	36,000 [d]	–	–	0 [d]	30,600 [d]	84,582 [d]	–
2011	0 [d]	5,283 [d]	1,810 [d]	–	292 [d]	0 [d]	9,225 [d]	260 [d]	120 [d]
2012	0 [d]	7,911 [d]	0 [d]	–	–	–	–	–	–

-continued-

	Fish River					Boston Creek				
Year [a]	Chinook	Chum	Pink	Pink & Chum [e]	Coho	Chinook	Chum	Pink	Pink & Chum [e]	Coho
1961	1	–	–	14,100	–					
1962	48	–	–	28,918	–					
1963	21	–	–	25,728	–	67	1,669	–	–	–
1964	–	18,670	10,935	14,550	–	10	3,315	–	–	–
1966	7	–	–	17,955	–	153	761	–	–	–
1967	–	–	–	13,610	–					
1968	10	–	–	164,000	–	7	2,500	2,500	–	–
1969	–	2,080	124,000	–	–	100	7,000	16,000	–	–
1970	33	76,550	198,000	–	–	246	8,200	12,900	–	–
1971	1	13,185	1,670	–	–	42	7,045	80	–	–
1972	–	3,616	13,050	–	–	57	4,252	3,950	–	–
1973	31	6,887	15,564	–	–	153	3,014	3,213	–	–
1974	3	10,945	15,690	–	–	231	2,426	749	–	–
1975	26	20,114	15,840	–	–	147	1,885	2,556	–	–
1976	1	8,390	15,850	8,550	–					
1977	9	9,664	2,430	–	–	76	1,325	385	–	–
1978	29	26,797	140,600	–	–	136	2,655	74,221	–	–
1979	11	6,893	9,132	–	–	58	882	271	–	–
1980	–	19,100	33,500	–	–	16	2,450	1,510	–	–
1981	90	24,095	450	–	–	–	1,985	–	–	–
1982	–	–	–	241,700	–	10	1,730	22,020	–	–
1983	87	20,037	300	–	–	154	704	–	–	–
1984	42	–	–	293,245	–	35	–	–	47,850	–
1985	303	21,080	7,365	–	–	243	3,450	–	–	–
1986	200	25,190	140	–	–	2	220	0	–	–
1987	193	7,886	0	–	–	583	3,640	0	–	–
1988	36	1,240	29,950 [c]	–	–	163	1,015	7,400 [c]	–	–
1989						112	1,455	8,440	–	–
1990	58	10,470	51,190	–	–	152	2,560	3,210	–	–
1991	4	390	1,387,000	–	–	68	1,540	50,850	–	–
1992	48	12,695	13,440	–	–	227	4,563	1,930	–	–
1994	55	16,500	910,000	–	–	95	4,270	355,600	–	–
1995	40	13,433	780	–	1,829	78	4,221	–	–	230
1996	189	5,840 [c]	684,780	–	–	–	3,505 [c]	35,980	–	–
1997	110	19,515	800	–	465	452	4,545	–	–	–
1998	96	28,010	663,050	–	–	255	1,570	175,330	–	–
1999	–	50	20	–	821	–	–	–	–	319
2000	–	–	–	–	805	–	–	–	–	414
2001	8	3,220	1,744	–	1,055	33	3,533	1,038	–	155
2003	95	3,200	1,014	–	–	145	750	701	–	–
2004	19	621	404,430	–	90	93	55	135,000	–	140
2005	0	6,875	319,170	–	–	46	1,675	5,850	–	–
2009	–	–	–	–	–	67 [d]	128 [d]	41 [d]	–	100 [d]
2010	–	–	–	–	–	29 [d]	3,010 [d]	5,110 [d]	–	73 [d]
2012	–	–	–	–	–	–	–	–	–	–

-continued-

Appendix A17.–Page 4 of 5.

	Niukluk River					Kwiniuk River				
Year	Chinook	Chum	Pink	Pink & Chum	Coho	Chinook	Chum [g]	Pink [g]	Pink & Chum	Coho
1962	11	–	–	27,878	–	3	–	–	23,249	–
1963	1	13,687	4,103	–	–	2	11,340	3,779	–	–
1964	–	8,395	10,495	–	–	–	14,533	–	–	–
1965						14	26,634	8,668	–	–
1966	–	21,300	8,600	4,700	–	7	32,786	10,629	–	–
1967	–	20,546	–	–	–	13	24,444	3,587	–	–
1968	–	–	–	87,093	–	27	18,813	129,052	–	–
1969	–	10,240	92,650	–	–	12	19,687	56,683	–	–
1970	–	7,300	60,350	–	–	–	68,004	226,831	–	–
1971	–	22,605	8,370	–	–	37	39,046	16,634	–	–
1972	–	10,500	22,600	–	–	65	30,686	62,461	–	–
1973	–	15,156	14,790	–	–	57	28,617	37,070	–	–
1974	1	8,720	8,915	–	–	62	35,899	39,375	–	–
1975	–	10,089	16,258	–	–	44	14,344	55,293	–	–
1976	–	4,130	7,190	–	–	12	6,977	35,226	–	375 [a]
1977	19	10,456	4,150	–	–	84	22,757	47,934	–	–
1978	2	14,365	208,300	–	–	74 [h]	14,408	70,148 [h]	–	–
1979	8	1,282	2,119	–	–	107	12,355	167,492	–	–
1980	–	8,915	75,770	–	–	177	19,374	319,363	–	–
1981	–	7,249	–	–	–	136	34,561	566,417	–	–
1982	20	2,557	227,440	–	–	138	44,036	469,674	–	–
1983	54	8,886	50	–	–	267	56,907	251,965	–	–
1984	6	34,572	22,636		998	736	54,043	736,544	–	983 [i]
1985	25	11,140	–	–	332 [j]	712	9,912	18,237	–	673 [i]
1986	2	2,442	0	–	–	653	24,704	241,446	–	421 [i]
1987	10	4,145	0	–	257 [j]	314	16,134	5,567	–	819 [i]
1988	18	6,521	8,160 [l]	–	1095 [j]	321	13,301	187,991	–	444 [i]
1989	–	–	–	–	182 [j]	282	13,689	27,487	–	–
1990	15	6,200	115,250	–	170	744	13,735	416,511	–	746 [i]
1991	42	10,700	37,410	–	1,783	587	18,802	53,499	–	809 [i]
1992	–	7,770	803,200	–	812	479	12,077	1,464,71	–	532 [i]
1993	15	19,910	2,840	–	2,104	565	15,823	43,065	–	1,238 [i]
1994	7	16,470	1,294,10	–	274	627	33,010	2,304,09	–	2,547
1995	48	25,358	200	–	2,136	468	42,161	17,509	–	1,625 [i]
1996	25	9,732	153,150	–	2,047	567	27,256	907,894	–	1,410 [i]
1997	131	16,550	–	–	983	972	20,118	9,536	–	610 [i]
1998	51	2,556	205,110	–	593	296	24,248	655,933	–	610 [i]
1999	–	640	–	–	619	115	8,763	608	–	223 [i]
2000	–	–	–	–	3,812	144	12,878	750,173	–	541 [i]
2001	6	2,448	2,856	–	809	258	16,598	8,423	–	9,532
2002	–	–	–	–	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	3,054,68	–	11,24
2005	6	3,225	154,000	–	–	342	12,083	341,048	–	12,95
2006	–	–	–	–	737 [j]	195	39,519	1,347,09	–	22,34
2007	–	–	–	–	–	258	27,756	54,225	–	9,429
2008	–	–	–	–	1,715	237	9,483	1,444,21	–	10,46
2009	–	–	–	–	–	444	8,739	42,960	–	9,036
2010	–	–	–	–	–	135	71,388	634,220	–	8,049
2011	4 [d]	9,735	375 [d]	–	838	57	31,604	30,023	–	3,288
2012	–	–	–	–	928 [d]	54	5,577	393,302	–	777

-continued-

Appendix A17.–Page 5 of 5.

Year [a]	Tubutulik River Chinook	Chum	Pink	Pink & Chum[e]	Coho	North River Chinook	Chum	Pink	Pink & Chum[e]	Coho
1962	3	–	–	16,690	–	162	–	–	16,087	–
1963	9	16,069	4,355	–	–	287 [h]	–	–	73,274	–
1964	–	15,469	10,043	3,420	–	23	–	–	5,981	–
1965										
1966	–	5,514	26,000	–	–	153	–	–	16,600	–
1967	1	–	–	22,475	–					
1969	3	12,040	12,788	3,045	–					
1970	–	53,290	136,590	–	–	1 [h]	20,655	1,240 [h]	–	–
1971	–	16,820	7,500	5,065	–	256 [h]	–	–	1,047 [h]	–
1972 [h]	–	8,070	21,100	–	–	561 [g]	2,332 [g]	54,934 [g]	–	–
1973	131	5,383	15,665	–	–	298 [g]	4,332 [g]	26,542 [g]	–	–
1974	136	9,560	17,940	–	–	196 [g]	826 [g]	143,789 [g]	–	–
1975	7	17,141	38,003	–	–	60 [h]	5,237 [h]	17,885 [h]	–	–
1976	–	1,095	6,095	2,600	–	66 [h]	1,963 [h]	10,606 [h]	–	–
1977	–	8,540	4,685	–	–	1,275	8,139	4,565	–	–
1978	2	5,865	1,364	–	–	321	9,349	21,813	–	–
1979	–	812	1,624	–	–	735	1,130	9,500	–	–
1980	405 [l]	21,616	663,937	–	–	61	2,300	127,900	–	204
1981	30	2,105	480			68	405	575	–	263
1982 [h]	49	2,044	53,605	–	–	8	599	168,902	–	4,145
1983	135	16,345	40,797	–	–	347	4,135	4,980	–	–
1984	270	56,210	93,600	–	–	2,844 [g]	2,915 [g]	458,387 [g]	–	152
1985	472	13,645	8,940	–	–	1,426 [g]	4,567 [g]	4,360 [g]	–	2,045
1986	453	5,975	35,680	–	–	1,613 [g]	3,738 [g]	236,487 [g]	–	–
1987	474	9,605	580	–	–	445	392	0	–	680
1988	561	4,662	114,340	–	–	202	30	112,770 [c]	–	240
1990	397	4,350	186,400	–	–	255	1,345	25,685	–	–
1991	661	7,085	26,870	–	–	656	2,435	119,140	–	2,510
1992	260	2,595	138,600	–	–	329	–	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	–	–	106	270 [c]	125,500	–	917
1997	1,946	3,105	16,890	–	–	1,605	9,045	17,870	–	–
1998	894	10,180	1,124,80	–	–	591		153,150	–	233
1999	–	–	–	–	–	18		3,790	–	533
2001	77	863	–	–	–	367		–	–	–
2002	42	180	182,000	–	–	122		4,590	–	800
2003	50	1,352	60	–	292	131		11,010	–	–
2004	321	1,117	391,000	–	779	189		264,000	–	1,386
2005	78	1,336	48,203	–	–	156		381,150	–	1,963
2006	–	–	–	–	–	–	–	–	–	–
2007	823	7,045	32,250	–	4,552	554	295	50,100	–	2,349
2008					4,197				–	2,774
2009	627	3,161	12,695	–	–	438	3,263	189,939	–	2,830
2010	122	16,097	16,520	–	50	124	1,627	1,480	–	200
2011	141 [d]	14,127 [d]	3,875 [d]	–	1,606	433	9,785	20,920	–	898
2012	–	–	–	–	2,889 [d]	–	–	–	–	–

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

[a] Represents "high count" for season.
[b] Boat survey.
[c] Numerous pink salmon made enumerating of chum salmon difficult; pink count may include some chum.
[d] Helicopter survey.
[e] Surveyor unable to distinguish between the 2 species.
[f] Foot survey.
[g] Total counts obtained from counting tower.
[h] Poor survey conditions or partial survey, poor counting tower conditions.
[i] Aerial survey, not tower count.
[j] Includes counts from Ophir Creek.
[k] Includes counts from Casadepaga and Ophir Creeks.
[l] Combined tower and aerial survey counts below the tower.

Appendix A18.–Combined aerial survey numbers of chum, pink, coho, and Chinook salmon for Norton Sound, 1985–2012.

Year[a]	Chum	Pink	Coho	Chinook
1985	74,367	50,342	3,392	3,200
1986	70,459	574,223	421	2,942
1987	53,168	7,997	2,513	1,451
1988	42,287	461,748	3,596	1,744
1989	21,541	69,112	719	447
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

[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 for Kwiniuk, Niukluk, Nome, and Snake rivers (starting 1995), North River (starting 1996), 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

[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.

Appendix A20.–Total escapement (6 rivers) and catch (commercial, subsistence, and sport fish) for chum, pink, coho, and Chinook salmon for Norton Sound District, 1995–2012.

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 [e]	126,087	1,243,794	52,632	2,510

[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.

[e] Sport fish data unavailable for 2012.

Appendix A21.–Nome Subdistrict chum salmon estimated escapement, 1999–2012.

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
			15,698				34,898
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
			44,553				33,197
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
			17,081				23,792
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
			40,662				87,374
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
			76,940				32,177

-continued-

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
			21,368				97,798
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
			66,122				52,076

[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, 2003–2012.

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

[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 2003–2012.

Year	Operating Period	Chinook	Chum	Pink	Coho	Sockeye	Dolly Varden
1995	July 01–Aug 18	0	4,393	917	856	0	n/a
1996	July 03–Aug 22	5	2,772	44,558	1,638	0	n/a
1997	July 07–Aug 18	12	6,184	6,742	1,157	0	n/a
1998	July 01–Aug 11	0	11,067	219,679	178	0	n/a
1999	July 01–Aug 14	20	484	116	90	0	n/a
2000	June 29–Aug 25	28	1,911	4,723	406	0	n/a
2001	July 08–Sept 05	33	2,182	1,295	1,335	0	n/a
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

[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, 1965–2012.

Year [a]	Operating Period	Chum	Pink	Chinook	Coho
1965	June 18–July 19	32,861	8,668	19	
1966	June 19–July 28	32,786	10,629	7	
1967	June 18–July 28	26,661	3,587	13	
1968	June 18–July 24	19,976	129,052	27	
1969	June 26–July 26	19,687	56,683	12	
1970	June 25–July 29	66,604	226,831		
1971	June 29–July 29	38,679	16,634		
1972	June 28–July 27	30,686	62,461	65	
1973	June 25–July 25	28,029	37,070	57	
1974	June 20–July 26	35,161	39,375	62	
1975	July 04–July 26	14,049	55,293	44	
1976	July 04–July 25	8,508	35,226	12	
1977	June 26–July 25	21,798	47,934		
1978	July 04–July 22	11,049	70,148		
1979	June 28–July 25	12,355	167,492	107	
1980	June 22–July 28	19,374	319,363	177	
1981	June 19–Aug 02	34,565	566,534	136	
1982	June 21–July 26	44,099	469,674	138	
1983	June 19–July 27	56,907	251,965	267	
1984	June 19–July 25	54,043	736,544	736 [b]	
1985	June 26–July 28	9,013	18,237	955 [c]	
1986	June 19–July 26	24,700	241,446	654	
1987	June 25–July 23	16,133	5,566	317	
1988	June18–July 26	13,303	187,907	321	
1989	June 27–July 27	14,529	27,488	248	
1990	June 21–July 25	13,957	416,512	900	
1991	June 18–July 27	19,801	53,499	708	
1992	June 27–July 28	12,077	1,464,716	479	
1993	June 27–July 27	15,824	43,063	600	
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	
1998	June 18–July 27	24,247	655,934	303	
1999	June 25–July 28	8,763	607	116	
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 07	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

[a] Counts from 1965-1994 are from the original project reports located in Nome office of ADF&G and counts for 1995-2003 are from Kohler 2003.

[b] Chinook salmon counts from 1965-1984 were not expanded.

[c] Chinook salmon counts in 1985 and after were expanded.

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

Appendix A26.–Historical salmon escapement at Nome River counting tower, 1993–1995, and weir, 1996–2012.

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	5,092	13,893	5	1,650	
1996	June 26–July 23	3,339	95,681 [a]	5	66	
1997	June 27–Aug 27	5,131	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

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

Appendix A27.–Historical sockeye salmon escapement at Glacial Lake weir, 2000–2012.

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

[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.

Appendix A28.–Historical salmon escapement at Inglutalik River counting tower, 2011-2012.

Year	Operating Period	Chum	Pink	Chinook	Coho
2011	June 24-Aug 14	64,892	494,099	1,467	870
2012	June 22-Aug 23	32,832	90,349	1,134	1,431

Note: The Inglutalik River counting tower was initiated in 2011.

Appendix A29.–Historical salmon escapement at North River counting tower, 1972–2012.

Year	Operating Period	Chum	Pink	Chinook	Coho
1972	July 07–July 28	2,332	54,934	561	
1973	June 29–July 23	4,334	26,542	298	
1974	June 25–July 17	826	143,789	196	
1984	June 25–July 28	2,915	458,387	2,844	
1985	June 27–Aug 31	4,567	4,360	1,426	2,045
1986	June 25–July 18	3,738	236,487	1,613	
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	580,929	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

Appendix A30.–Historical salmon escapement at Unalakleet River weir, 2010–2012.

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	234

Appendix A31.–Chum salmon escapement by river, Nome Subdistrict, 1993–2012.

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
Total	150,605	71,660	73,840	221,364	304,506	96,047	37,052	955,074

[a] Sinuk, Flambeau, Bonanza and Solomon escapements are estimated by aerial survey.

[b] Snake 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 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 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 A32.–Pink salmon escapement by year and river, Nome Subdistrict, 1993–2012.

	Rivers West of Cape Nome			Rivers East of Cape Nome				
Year	Sinuk [a]	Snake [b]	Nome [c]	Flambeau [a]	Eldorado [d]	Bonanza [a]	Solomon [a]	Total
1993	5,120		13,036	5,584	120			23,860
1994	492,100	63,860	142,604	19,202	53,890	20		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		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		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
Total	5,166,169	778,835	4,204,202	93,965	1,069,492	1,136,676	485,815	12,935,154

[a] Sinuk, Flambeau, Bonanza and Solomon escapements are estimated by aerial survey.

[b] Snake escapements are estimated by aerial survey (1993–1994), tower counts (1995–2002), and weir counts (2003–2012).

[c] Nome escapements are estimated by tower counts (1993–1995), and weir counts (1996–2012). Escapement goal range is 13,000 pink salmon in even-numbered years and 3,200 pink salmon in odd-numbered years.

[d] Eldorado escapements are estimated by aerial survey (1993–1996), tower counts (1997–2002), and weir counts (2003–2012).

Appendix A33.–Number of customary trade permits issued, Norton Sound District and Port Clarence District, 2007–2012.

	Norton Sound District								
Year	Nome	Golovin	Elim	Norton Bay	Shaktoolik	Unalakleet	St. Michael & Stebbins	Port Clarence District	Value
2007	3	0	2	0	0	0	0	0	$200.00
2008	3	0	0	0	0	0	0	1	$0.00
2009	0	0	0	0	0	0	0	1	Confidential
2010	1	0	0	0	0	0	0	0	Confidential
2011	0	0	0	0	0	0	1	0	Confidential
2012	2	0	0	0	0	0	0	0	Confidential

APPENDIX B: PORT CLARENCE FISHERIES

Appendix B1.–Comparative sockeye salmon aerial survey indices, Port Clarence District, 1963–2012.

Year	Salmon Lake	Grand Central River	Total	Year	Salmon Lake	Grand Central River	Total
1963	866	620	1,486	1988	1,195	6	1,201
1964 [a]	76	590	666	1989	3,055	525	3,580
1965	250	160	410	1990	2,834	926	3,760
1966	1,120	370	1,490	1991	3,790	1,570	5,360
1967	129	280	409	1992	1,500	[b]	1,500
1968 [a]	830	645	1,475	1993	2,885	216	3,092
1969	24	171	195	1994	3,740	1,230	4,970
1970 [b]	–	–	–	1995	5,433	628 [c]	6,061
1971	538	512	1,050	1996	6,610	770	7,380
1972 [a]	680	300 [d]	980	1997	8,760	1,520	10,280
1973	1,747	607	2,354	1998	5,210	1,977	7,187
1974	820	–	820	1999	31,720	1,780	33,500
1975	537	123	660	2000	12,772	[b]	12,772
1976	132	22	154	2001	9,400	155	9,555
1977	317	235	552	2002	3,520	71	3,591
1978	822	280	1,102	2003	19,275	1,015	20,290
1979	1,250	261	1,511	2004	23,005	2,855	25,860
1980 [a]	512	175	687	2005	41,500	740	42,240
1981	–	–	–	2006	39,400	2,380	41,780
1982	–	–	–	2007	14,920	5,692	20,612
1983	970	–	970	2008	9,420	2,252	11,672
1984	445	30	475	2009	136	50	186
1985	730	250	980	2010	73	711	784
1986	2,125	160	2,285	2011	4,604	540	5,144
1987	4,040	530	4,570	2012	4,730	1,100	5,830

[a] Poor survey.
[b] No survey made.
[c] Boat survey.
[d] Early count.

Appendix B2.–Historical escapement of salmon and Dolly Varden at Pilgrim River counting tower, 1997–2002 and weir 2003–2012.

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]	n/a
1998	Did not operate							
1999	July 13–Aug 06	6	2,617		35,577	104	4,650	n/a
2000	July 05–Aug 18	72	861		374	21	12,141	n/a
2001	Did not operate							
2002	July 04–Aug 04	150	5,590		3,882	246	3,888	n/a
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

[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.–Subsistence surveys conducted in Port Clarence District, 1963–2012.

Year [a]		Number of Fishing Families Interviewed		Chinook	Sockeye	Coho	Pink	Chum	Total
1963		19		9	4,866	25	1,061	1,279	7,240
1964		22		17	1,475	227	371	1,049	3,139
1965		29		36	1,804	639	1,854	1,602	5,935
1966		26		10	1,000	896	859	2,875	5,640
1967		19		12	2,068	232	767	1,073	4,152
1968		24		40	688	133	1,906	904	3,671
1969		13		2	180	27	548	932	1,689
1970		18		4	588	1,071	1,308	4,231	7,202
1971		22		31	850	959	1,171	3,769	6,780
1972		8		4	68	388	75	2,806	3,341
1973		4		22	46	280	424	1,562	2,334
1974		13		0	28	62	14	2,663	2,767
1975		17		0	244	5	743	1,589	2,581
1976		15		7	291	20	436	6,026	6,780
1977	[b]	13		-	-	-	-	-	5,910
1978		26		1	392	0	7,783	705	8,881
1979		26		0	320	35	741	1,658	2,754
1980		22		7	3,195	5	3,170	1,715	8,092
1981		10		8	255	110	765	5,845	6,983
1982		27		23	405	100	4,345	684	5,557
1983	[c]	3		17	261	-	615	299	1,192
1989	[d]	15		28	535	472	395	410	1,840
1994	[e]	127		203	2,220	1,892	4,309	2,294	10,918
1995	[e]	122		76	4,481	1,739	3,293	6,011	15,600
1996	[e]	117		194	2,634	1,258	2,236	4,707	11,029
1997	[e]	126		158	3,177	829	755	2,099	7,018
1998	[e]	138		289	1,696	1,759	7,815	2,621	14,180
1999	[e]	155		89	2,392	1,030	786	1,936	6,233
2000	[e]	134		72	2,851	935	1,387	1,275	6,520
2001	[e]	160		84	3,692	1,299	1,183	1,910	8,168
2002	[e]	159		133	3,732	2,194	3,394	2,699	12,152
2003	[e,f]	204		177	4,495	1,434	4,113	2,430	12,649
2004	[g]	376	[h]	278	8,688	1,131	5,918	2,505	18,520
2005	[g]	335	[h]	152	8,492	726	6,615	2,479	18,464

-continued-

Year [a]		Number of Fishing Families Interviewed		Chinook	Sockeye	Coho	Pink	Chum	Total
2006	[g]	345	[h]	102	9,940	1,061	4,939	4,353	20,395
2007	[g]	363	[h]	85	9,484	705	1,468	4,454	16,196
2008	[g]	408	[h]	125	5,069	512	7,527	2,449	15,682
2009	[g]	326	[h]	40	1,643	804	1,882	3,060	7,429
2010	[g]	290	[h]	63	824	596	5,202	5,232	11,917
2011	[g]	267	[h]	57	1,611	393	2,610	4,338	9,008
2012	[g]	156	[h]	44	1,422	703	5,200	7,802	15,171

[a] Surveys were not conducted from 1984 to 1988, and from 1990 to 1993.

[b] Species composition was estimated at 75% chum, 10% pink, 10% sockeye and 5% Chinook and coho salmon combined.

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

[d] Survey conducted by the ADF&G Division of Subsistence, which contacted 15 of 43 households in Brevig Mission.

[e] Harvest estimate from ADF&G Division of Subsistence survey.

[f] Includes harvest reported from 59 Pilgrim River permits. 101 permits were issued and 79 were returned.

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

[h] 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, 1997–2012.

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

APPENDIX C: KOTZEBUE FISHERIES

Appendix C1.–Kotzebue District chum salmon catch statistics, 1962–2012.

Year	Total Catch	Number of Fishermen [a]	Season Catch per Fisherman	Year	Total Catch	Number of Fishermen [a]	Season Catch per Fisherman
1962	129,948	84	1,547	1988	352,915	193	1,829
1963	54,445	61	893	1989	254,617	165	1,543
1964	76,449	52	1,470	1990	163,263	153	1,067
1965	40,025	45	889	1991	239,923	142	1,690
1966	30,764	44	699	1992	289,184	149	1,941
1967	29,400	30	980	1993 [b]	73,071	114	641
1968	30,212	59	512	1994	153,452	109	1,408
1969	59,335	52	1,141	1995	290,730	92	3,160
1970	159,664	82	1,947	1996	82,110	55	1,493
1971	154,956	91	1,703	1997	142,720	68	2,099
1972	169,664	104	1,631	1998	55,907	45	1,242
1973	375,432	148	2,537	1999	138,605	60	2,310
1974 [c]	627,912	185	3,394	2000	159,802	64	2,497
1975 [d]	563,345	267	2,110	2001	211,672	66	3,207
1976	159,796	220	726	2002	8,390	3	2,797
1977	195,895	224	875	2003	25,423	4	6,356
1978	111,494	208	536	2004	51,038	43	1,187
1979	141,623	181	782	2005	75,971	41	1,853
1980	367,284	176	2,087	2006	137,961	42	3,285
1981	677,239	187	3,622	2007	147,087	46	3,198
1982	417,790	199	2,099	2008	190,550	48	3,970
1983	175,762	189	930	2009	187,562	62	3,025
1984	320,206	181	1,769	2010	270,343	67	4,035
1985	521,406	189	2,759	2011	264,225	89	2,970
1986	261,436	187	1,398	2012	227,965	83	2,747
1987	109,467	160	684				
Avg 1962-2011	198,549	111	1,970	Avg 1962-2011	198,549	111	1,970

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

[b] Includes 2,000 chum salmon from the Sikusuilaq Springs Hatchery terminal fishery.

[c] Includes 6,567 chum salmon from the Deering experimental fishery.

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

Appendix C2.–Kotzebue District chum salmon type of processing and weights, 1962–2012.

Year	Chum Salmon Cases (48 lb)	Chum Salmon Round weight in pounds	Other [a]	Fresh Frozen Salmon Roe (pounds)	Cured Pounds	Year	Chum Salmon Cases (48 lb)	Chum Salmon Round weight in pounds	Other [a]	Fresh Frozen Salmon Roe (pounds)
1962	14,500					1988		3,060,292	2,120	
1963	5,396					1989		2,163,174	1,426	
1964	5,421	202,993				1990		1,453,040	538	
1965	1,929	207,350				1991		1,951,041	714	
1966		310,716		13,600	3,065	1992		2,397,302	2,714	
1967		273,420			11,488	1993 [b]		613,968	1,507	1,000
1968		288,500			11,850	1994 [c]		1,166,494	73	
1969		455,013			8,183	1995		2,329,898	93	
1970		1,240,000			48,377	1996 [d]		97,510	51	
1971		1,264,753			27,542	1997		1,141,741	649	
1972		1,547,041			55,376	1998		447,256	2,971	
1973		3,416,431			144,768	1999		1,108,898	87	
1974		5,361,130 [e]				2000		1,370,637	106	
1975		4,877,313 [f]				2001		1,847,361	64	
1976		1,415,549	487			2002		74,341	0	
1977		1,846,340	1,075			2003		218,091	0	
1978		1,009,121	32,419			2004		419,059	1,450	
1979		1,236,429	6,155			2005		621,573	1,258	
1980		3,160,948	7,828			2006		1,040,023	0	
1981		6,139,518	2,210			2007		1,209,842	0	
1982		3,833,051	790	100		2008		1,541,922	0	
1983		1,647,160	2,449			2009		1,505,734	0	
1984		2,631,582	1,593			2010		2,160,264	0	
1985		4,528,379	1,106			2011		2,158,365	0	
1986		2,271,320	1,691			2012		1,751,473	0	
1987		900,405	597							

Note: Data not available for all years.

[a] Chinook, 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.

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

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

Appendix C3.–Kotzebue District mean prices paid per pound in dollars to salmon fishermen by species, 1962–2012.

Year [a]	Chum Salmon Average Weight	Chum Salmon Average Price	Chinook Salmon	Pink Salmon	Inconnu	Dolly Varden	Year [a]	Chum Salmon Average Weight	Chum Salmon Average Price	Chinook Salmon	Pink Salmon	Inconnu	Dolly Varden
1962		0.35 [b]					1988	8.7	0.85	1.98			0.35
1963		0.35 [b]					1989	8.5	0.28	1.72			0.28
1964	8.3	0.45 [b]					1990	8.9	0.31	2.00			0.25
1965	9.0	0.45			1.30 [b]		1991	8.1	0.22	1.64		0.50	0.18
1966	10.1	0.11			1.40 [b]	0.55	1992	8.3	0.22	1.89		0.58	0.10
1967	9.3	0.11			1.50 [b]	0.75	1993	8.5	0.38	2.37		0.50	0.10
1968	9.7	0.14			0.91 [b]	0.98	1994	7.8	0.20	1.14			0.17
1969	7.5	0.15			1.30 [b]	2.84	1995	8.0	0.13	1.00		0.50	0.20
1970	8.1	0.15					1996	8.0	0.09	1.00		0.44	0.25
1971	8.1	0.16			0.16	0.17	1997	8.0	0.16	1.02			0.20
1972	9.1	0.17			0.20	0.17	1998 [d]	8.0	0.15	1.00			0.20
1973	9.1	0.25			0.30	0.16	1999 [d]	8.0	0.16	1.00			0.20
1974 [c]	8.5	0.34			0.30	0.16	2000	8.6	0.18	1.00			0.20
1975 [c]	8.6	0.28			0.30	0.30	2001	8.7	0.17	1.00			
1976	8.9	0.41			0.30	0.30	2002	8.9	0.10	0.00			
1977	9.6	0.56			0.30		2003	8.6	0.12	0.00			0.50
1978	9.1	0.57			0.30	0.25	2004	8.2	0.15	0.72			0.26
1979	8.8	0.80				0.25	2005	8.2	0.20	0.50			0.30
1980	8.6	0.46			0.10	0.20	2006	7.5	0.22				
1981	9.1	0.53			0.75	0.17	2007	8.2	0.20				
1982	9.3	0.51	1.25	0.15	0.75	0.20	2008	8.1	0.25				
1983	9.4	0.25	1.08	0.13		0.20	2009	8.0	0.25				
1984	8.2	0.44	1.03			0.25	2010	8.0	0.40				
1985	8.7	0.47	1.25			0.25	2011	8.2	0.40				
1986	8.7	0.41	1.25			0.20	2012	7.7	0.32				
1987	8.2	0.57	1.25			0.30							

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

[b] Price per fish.

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

[d] Each chum salmon was assumed to weigh 8 pounds, but no fish were weighed individually.

Appendix C4.–Kotzebue District commercial fishery dollar value estimates, 1962–2012.

Year	Gross Value of Catch to Fishermen [a]	Number of Fishermen	Average Value Per Fisherman	Year	Gross Value of Catch to Fishermen [a]	Number of Fishermen	Average Value Per Fisherman
1962	$4,500	84	$54	1988	$2,581,333	193	$13,375
1963	$9,140	61	$150	1989	$613,823	165	$3,720
1964	$34,660	52	$667	1990	$438,044	153	$2,863
1965	$18,000	45	$400	1991	$437,948	142	$3,084
1966	$25,000	44	$568	1992	$533,731	149	$3,582
1967	$28,700	30	$957	1993 [b]	$235,061	114	$2,062
1968	$46,000	59	$780	1994	$233,512	109	$2,142
1969	$71,000	52	$1,365	1995	$316,031	92	$3,435
1970	$186,000	82	$2,268	1996	$56,310	55	$1,024
1971	$200,000	91	$2,198	1997	$187,978	68	$2,764
1972	$260,000	104	$2,500	1998	$70,587	45	$1,569
1973	$925,000	148	$6,250	1999	$179,781	60	$2,996
1974 [c]	$1,822,784	185	$9,853	2000	$246,786	64	$3,856
1975 [d]	$1,365,648	267	$5,115	2001	$322,650	66	$4,889
1976	$580,375	220	$2,638	2002	$7,572	3	$2,524
1977	$1,033,950	224	$4,616	2003	$26,377	4	$6,594
1978	$575,260	208	$2,766	2004	$64,420	43	$1,498
1979	$990,263	181	$5,471	2005	$124,820	41	$3,044
1980	$1,446,633	176	$8,220	2006	$229,086	42	$5,454
1981	$3,246,793	187	$17,363	2007	$243,149	46	$5,286
1982	$1,961,518	199	$9,857	2008	$385,270	48	$8,026
1983	$420,736	189	$2,226	2009	$376,554	62	$6,073
1984	$1,148,884	181	$6,347	2010	$860,125	67	$12,838
1985	$2,137,368	189	$11,309	2011	$867,085	89	$9,743
1986	$931,241	187	$4,980	2012	$567,664	83	$6,839
1987	$515,000	160	$3,219				
Avg. 1962-2011	$592,450	111	$4,492	Avg. 1962-2011	$592,450	111	$4,492

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

[b] Includes $3,648 from Sikusuilaq Springs Hatchery terminal fishery.

[c] Includes $9,193 from the experimental commercial fishery at Deering.

[d] Includes $17,776 from the experimental commercial fishery at Deering.

Appendix C5.–Kotzebue District commercial (1914–1918, and 1962–2012) and subsistence salmon catches (1957, 1962–1986, and 1994–2004).

	Commercial Catch				Subsistence Catch			
Year [a]	Chum [b]	Other [c]	Total		Chum	Number of Fishermen Interviewed	Average Catch per Fisherman	Total Documented Catch
1914	8,550		8,550					
1915	4,750		4,750					
1916	19,000		19,000					
1917	44,612		44,612					
1918	27,407		27,407					
1957					298,430 [d]			
1962	129,948	27	129,975		70,284	81	868	200,259
1963	54,445	143	54,588		31,069	67	464	85,657
1964	76,499	5	76,504		29,762	58	513	106,266
1965	40,034		40,034		30,500	89	343	70,534
1966	30,764	1	30,765		35,588	121	294	66,353
1967	29,400		29,400		40,108	135	297	69,508
1968	30,384 [e]		0		20,814	65	320	20,814
1969	59,335	48	59,383		29,812	99	301	89,195
1970	159,664		159,664		29,116	164	178	188,780
1971	154,956	1	154,957		31,959	152	210	186,916
1972	169,664	3	169,667		11,894	96	124	181,561
1973	375,432	5	375,437		18,992	101	188	394,429
1974	634,479 [f]	48	48		26,744	88	304	26,792
1975	563,682 [g]	36	36		27,605	95	291	27,641
1976	159,796	2	159,798		15,715	91	173	175,513
1977	195,895		195,895		9,752	83	117	205,647
1978	111,494	7,007	118,501		12,914	85	152	131,415
1979	141,623	910	142,533		14,605	97	151	157,138
1980	367,284	1,654	368,938		10,629	111	96	379,567
1981	677,239	237	677,476		17,766	71	250	695,242
1982	417,790	57	417,847		30,243	204	148	448,090
1983	175,762	229	175,991		10,287 [h]	46	0	175,991
1984	320,206	107	320,313		15,420 [h]	66	0	320,313
1985	521,406	63	521,469		31,478 [i]	243	0	521,469
1986	261,436	106	261,542		50,458	837	60	312,000
1987	109,467	44	109,511		9,988 [j]	[j]	[j]	109,511
1988	352,915	152	353,067		13,723 [j]	[j]	[j]	353,067
1989	254,617	87	254,704		5,489 [j]	[j]	[j]	254,704
1990	163,263	32	163,295		8,268 [j]	[j]	[j]	163,295
1991	239,923	44	239,967		14,740 [j]	[j]	[j]	239,967
1992	289,184	204	289,388		14,303 [j]	[j]	[j]	289,388
1993	73,071 [k]	131	131		15,430 [j]	[j]	[j]	131
1994	153,452 [l]	3	3		36,226 [m]	375	97	36,229
1995	290,730	5	290,735		102,881	593	173	393,616
1996	82,110 [n]	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
Average 2002-'11	135,865	176	136,040	Average 1995-'04	57,977	457	127	174,709

-continued-

	Commercial Catch				Subsistence Chum Salmon Catch			
Year [a]	Chum [b]	Other [c]	Total		Chum	Number of Fishermen Interviewed	Average Catch per Fisherman	Total Documented Catch
2001	211,672	6	211,678		49,232	408	121	260,910
2002	8,390	0	8,390		16,880 [mo]	191	88	25,270
2003	25,423	0	25,423		19,201 [m]	446	43	44,624
2004	51,038	116	51,154		24,637	440	63	75,791
2005	75,971	7	75,978		2005 subsistence surveys were not conducted.			
2006	137,961	17	137,978		2006 subsistence surveys were not conducted.			
2007	147,087	20	147,107		2007 subsistence surveys were not conducted.			
2008	190,550	742	191,292		2008 subsistence surveys were not conducted.			
2009	187,562	106	187,668		2009 subsistence surveys were not conducted.			
2010	270,343	583	270,926		2010 subsistence surveys were not conducted.			
2011	264,321	166	264,487		2011 subsistence surveys were not conducted.			
2012	227,965	476	228,441		2012 data are not yet available from village surveys.			
Average 2002-2011	135,865	176	136,040	Average 1995-2004	57,977	457	127	201,286

Note: Data not available for all years.

[a] There was no commercial fishing during 1919–1961.

[b] Catches for 1914–1918 are from pack data only. Number of chum salmon estimated at 9.5 per case (#48) and 34 per barrel.

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

[d] Estimated mean annual catches prior to 1957 (study by Raleigh).

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

[f] Includes 6,567 chum salmon from the Deering experimental fishery.

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

[h] Partial survey.

[i] Does not include harvest from the villages of Noatak and Kivalina.

[j] Information not available.

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

[l] Includes 4,000 chum salmon commercially harvested on August 5 but not sold.

[m] Does not include the town of Kotzebue.

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

[o] Only 2 of 6 villages surveyed.

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

Year	Village					Kobuk River Village	Noata Villag	Village						District Total
	Noorvi	Kian	Amble	Shungna	Kobu			Kotzebu	Deerin	Kivalin	Bucklan	Candl	Shishmare	
1962	15,934	3,139	[a]	[a]	2,321	21,394	48,890	[a]	[a]	[a]	[a]	[a]	[a]	70,284
1963	4,304	1,973	755	1,240	200	8,472	16,762	5,835	[a]	[a]	[a]	[a]	[a]	31,069
1964	2,167	783	2,142	3,134	1,020	9,246	12,763	7,753	[a]	[a]	[a]	[a]	[a]	29,762
1965	5,596	1,598	1,340	2,160	877	11,571	5,671	8,058	5,200	[a]	[a]	[a]	[a]	30,500
1966	3,141	433	912	899	625	6,010	19,700	3,640	6,238	[a]	[a]	[a]	[a]	35,588
1967	2,350	1,489	679	1,500	175	6,193	26,512	4,032	3,098	[a]	162	11	100	40,108
1968	2,424	2,488	457	1,600	1,030	7,999	5,490	4,324	2,838	[a]	37	89	37	20,814
1969	1,301	2,458	3,525	2,550	1,655	11,489	14,458	1,768	1,897	[a]	-	200	-	29,812
1970	6,077	3,457	2,899	3,450	600	16,483	4,120	6,814	1,242	[a]	344	113	-	29,116
1971	7,144	5,177	2,299	2,653	1,931	19,204	9,919	1,737	763	[a]	155	50	131	31,959
1972	1,744	1,435	1,469	2,665	2,119	9,432	741	1,151	369	[a]	59	113	29	11,894
1973	2,312	4,470	1,529	4,406	1,917	14,634	216	1,172	1,098	[a]	1,722	50	100	18,992
1974	6,809	2,726	1,651	6,243	2,251	19,680	4,330	[a]	1,880	[a]	639	15	200	26,744
1975	4,620	4,320	3,390	9,060	1,755	23,145	1,515	[a]	1,175	[a]	1,540	[a]	230	27,605
1976	1,555	1,579	2,000	4,213	562	9,909	4,448	[a]	1,358	[a]	[a]	[a]	[a]	15,715
1977	891	766	385	1,760	325	4,127	2,125	[a]	3,500	[a]	[a]	[a]	[a]	9,752
1978	2,034	1,493	2,224	4,766	852	11,369	1,495	[a]	[a]	[a]	[a]	50	[a]	12,914
1979	2,155	1,225	2,400	2,947	651	9,378	2,227	[a]	2,000	[a]	1,000	[a]	[a]	14,605
1980	2,229	2,551	660	2,704	350	8,494	2,135	[a]	[a]	[a]	[a]	[a]	[a]	10,629
1981 [b,]	3,488	1,439	782	2,800	950	9,459	5,465	2,387	295	110	50	[a]	[a]	17,766
1982 [b]	7,433	4,918	2,506	4,191	600	19,648	5,479	4,099	807	210	[a]	[a]	[a]	30,243
1983 [b,]	277	223	1,062	3,556	368	5,486	4,035	347	219	200	[a]	[a]	[a]	10,287
1984 [b,]	[a]	[a]	2,990	4,241	[a]	7,231	6,049	88[b]	1,940	200	[a]	[a]	[a]	15,508
1985	7,015	3,494	3,487	3,115	300	17,411	[a]	13,494	573	[a]	[a]	[a]	[a]	31,478
1986	8,418	[a]	[a]	4,483	[a]	12,901	1,246	36,311	[a]	[a]	[a]	[a]	[a]	50,458
1987	5,092	[a]	[a]	1,975	[a]	7,067	2,921	[a]	[a]	[a]	[a]	[a]	[a]	9,988
1988	7,500	[a]	[a]	6,223	[a]	13,723	[a]	[a]	[a]	[a]	[a]	[a]	[a]	13,723
1989	[a]	[a]	[a]	3,894	[a]	3,894	1,595	[a]	[a]	[a]	[a]	[a]	[a]	5,489
1990	4,353	[a]	[a]	[a]	[a]	4,353	3,915	[a]	[a]	[a]	[a]	[a]	[a]	8,268
1991	6,855	[a]	[a]	4,248	[a]	11,103	3,637	[a]	[a]	[a]	[a]	[a]	[a]	14,740
1992	8,370	[a]	[a]	3,890	[a]	12,260	2,043	[a]	[a]	[a]	[a]	[a]	[a]	14,303
1993	8,430	[a]	[a]	3,730	[a]	12,160	3,270	[a]	[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]	[a]	36,226
1995	15,485	5,985	8,558	5,880	2,959	38,867	6,359	50,708	[a]	[a]	[a]	[a]	6,947	102,88

-continued-

	Village					Kobuk River	Noatak	Village						District
Year	Noorvik	Kiana	Ambler	Shungnak	Kobuk	Villages	Village	Kotzebue	Deering	Kivalina	Buckland	Candle	Shishmaref	Total
1996	13,611	5,935	9,062	8,649	1,819	39,076	10,091	50,573	[a]	[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]	[a]	57,906
1998	9,845	3,414	2,432	4,676	1,031	21,398	2,614	24,968	[a]	[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]	[a]	94,342
2000	10,391	2,876	5,009	2,944	318	21,538	7,293	37,144	[a]	[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]	[a]	49,232
2002	13,943	[f]	[f]	[f]	[f]	[f]	2,937	[f]	[a]	[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]	[a]	19,201
2004	6,025	3,896	3,446	4,186	3,087	20,640	3,997	[a]	[a]	[a]	[a]	[a]	[a]	24,637

Note: No subsistence surveys were conducted from 2004 to 2011. Kobuk River villages and Noatak were surveyed by the Division of Subsistence in 2012, but data are not yet available.

[a] Not surveyed.

[b] No household survey; information is from return of mail-in questionnaires.

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

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

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

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

Appendix C7.–Kotzebue District average subsistence chum salmon harvest per household by village, 1962–2004.

Year	Kotzebue	Noatak	Noorvik	Kiana	Ambler	Shungnak	Kobuk	Deering	Year	Kotzebue	Noatak	Noorvik	Kiana	Ambler	Shungnak	Kobuk	Deering
1962	[a]	1190	665	350	[a]	[a]	335	[a]	1984	44	173	[a]	[a]	214	303	[a]	194
1963	650	800	160	[b]	94	[b]	67	[a]	1985	107	[a]	206	116	152	195	50	72
1964	515	710	220	260	310	[a]	205	[a]	1986	47	69 [c]	271	[a]	[a]	195	[a]	[a]
1965	400	810	220	265	190	220	145	[a]	1987	[a]	225 [c]	189	[a]	[a]	329	[a]	[a]
1966	158	820	137	62	76	45	104	[a]	1988	[a]	[a]	300	[a]	[a]	389	[a]	[a]
1967	202	914	90	68	49	125	35	[a]	1989	[a]	133	[a]	[a]	[a]	216	[a]	[a]
1968	135	220	84	96	33	114	206	[a]	1990	[a]	135	198	[a]	[a]	[a]	[a]	[a]
1969	98	760	163	223	235	318	206	[a]	1991	[a]	145	311	[a]	[a]	283	[a]	[a]
1970	187	242	132	138	242	182	150	[a]	1992	[a]	89	310	[a]	[a]	243	[a]	[a]
1971	53	148	223	207	177	133	386	[a]	1993	[a]	136	312	[a]	[a]	196	[a]	[a]
1972	63	74	84	84	244	266	302	[a]	1994	[a]	90	133	32	99	154	260	92
1973	195	36	121	178	305	489	273	[a]	1995	71	69	123	59	110	111	110	[a]
1974	[a]	393	324	181	165	891	450	[a]	1996	73	115	117	58	111	154	76	[a]
1975	[a]	138	210	288	282	647	293	[a]	1997	41	71	125	35	39	117	28	[a]
1976	[a]	212	259	79	250	281	70	[a]	1998	35	27	79	34	30	84	41	[a]
1977	[a]	425	56	38	55	104	41	[a]	1999	78	18	151	42	8	76	81	[a]
1978	[a]	79	88	71	131	265	142	[a]	2000	48	72	93	33	72	64	11	[a]
1979	[a]	114	98	68	160	184	108	[a]	2001	23	24	152	62	[a]	94	109	[a]
1980	[a]	164	318	213	132	246	88	[a]	2002	[a]	29	121	[a]	[a]	[a]	[a]	[a]
1981	213	579	388	131	129	233	317	[a]	2003	[a]	21	58	32	26	57	43	[a]
1982	84	189	323	246	167	262	200	81	2004	[a]	50	56	46	56	75	111	[a]
1983 [d]	50	269	139	223	531	254	368	44									

Note: No subsistence surveys were conducted from 2004 to 2011. Data not yet available from 2012 Division of Subsistence surveys of Kobuk River villages and Noatak.

[a] Not surveyed.

[b] Number of fishermen not known.

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

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

Appendix C8.–Kotzebue District chum salmon aerial survey counts, 1962–2012.

Stream [a]	1962	1963	1964	1965	1966	1967	1968	1969	1970
Noatak Drainage									
Noatak River below Kelly River	168,000 [b]	1,970 [c, d]	89,798	6,152 [c, d]	101,640	29,120 [c]	39,394	33,945	138,145
Eli River	9,080 [b]	35			120		5,502 [e]	68 [e]	
Kelly River & Lake	1,818 [b]	600		3,155	570	225	375	150	
Noatak River System Total	178,898	2,605	89,798	9,307	102,330	29,345	45,271	34,163	138,145
Kobuk Drainage									
Kobuk to Pah River		400		1,750	266		530		
Pah River to just below Selby River		1,530		500			50		1,753
Selby River mouth & Slough		1,045		500	630	1,625	70		20
Selby R. mouth to Beaver C.		1,095				75	170		4,820
Beaver Creek mouth					460	795	1,550		2,385
Above Beaver Creek		465			118				4,930
Upper Kobuk River Total	9,224 [b]	4,535	7,985 [f]	2,750	1,474	2,495	2,370	7,500 [g]	13,908
Squirrel River	5,834 [b]	2,200	8,009	7,230	1,350	3,332	6,746	6,714	4,418
Salmon River	12,936 [b]	1,535	9,353	1,500 [c]	3,957	2,116	3,367	2,561	3,000 [c]
Tutuksuk River	10,841 [b]	670	2,685		1,383	169	823 [c]	159	2,000 [c]
Kobuk River System Total	38,835 [g]	8,940	28,032	11,480	8,164	8,112 [g]	13,306	16,934	23,326

-continued-

Appendix C8.–Page 2 of 6.

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

-continued-

Appendix C8.–Page 3 of 6.

Stream [a]	1980	1981 [c]	1982 [c]	1983	1984	1985 [c]	1986 [c]	1987 [c]	1988 [c]	1989 [d]
Noatak Drainage										
Noatak River below Kelly River	164,474	116,352	20,682	79,773	67,873	45,525	37,227	5,515 [c, d]	45,930 [c, d]	
Eli River	10,277		189	3,044	5,027	855	4,308	2,780	8,639	
Kelly River & Lake	7,416	13,770	11,604	12,137	3,499	1,200	839	950	1,460	
Noatak River System Total	182,167	130,122	32,475	94,954	76,399	47,580	42,374	9,245	56,029	
Kobuk Drainage										
Kobuk to Pah River	1,694	18	2,643 [c]	2,147	402	2,048 [i]	531			
Pah River to just below Selby River	2,069	309	598 [c]	2,433	257	241 [i]	511	2,250	1,135 [c]	
Selby River mouth & slough		8,321 [b, h]	2,454	11,683		711 [i]	673	1,470	820 [c]	
Selby R. mouth to Beaver C.	6,925 [b]		7,268	13,011	5,910	3,278 [i]	3,282	1,350	6,890 [c]	
Beaver Creek mouth	784		1,711	3,059						
Above Beaver Creek				1,413	4,052		1,018	3,140	3,050 [c]	
Upper Kobuk River Total	11,472	8,648	14,674	33,746	10,621	6,278	6,015	8,210	11,895 [c]	
Squirrel River	13,563	9,854	7,690	5,115	5,473	6,160	4,982	2,708 [g]	4,848 [c]	
Salmon River	8,456	4,709	1,821 [g]	1,677	1,471	2,884	1,971	3,333	6,208	
Tutuksuk River	1,165	1,114	1,322	2,637	1,132	5,098	4,257	206	3,122	
Kobuk River System Total	34,656	24,325	25,507	43,175	18,697	20,420	17,225	14,457	26,073	

-continued-

Appendix C8.–Page 4 of 6.

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

-continued-

Appendix C8.–Page 5 of 6.

Stream [a]	2000 [j]	2001	2002	2003	2004	2005 [j]	2006	2007 [j]	2008	2009
Noatak Drainage										
Noatak River below Kelly River			700	34,575	49,541		36,125 [c]		257,695	67,265
Eli River					2,917		1,285 [c]		13,052	2,607
Kelly River & Lake			1,116	1,566	2,987		2,375 [c]		1,865	3,986
Noatak River System Total				36,141	55,445		39,785 [c]		272,612	73,858
Kobuk Drainage										
Kobuk to Pah River		2,790		5,501	7,493		8,525 [c]		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 [c]		1,750	208
Selby R. mouth to Beaver C.		7,470		1,274	6,215				13,201	26,627
Beaver Creek mouth										
Above Beaver Creek			490	2,462					3,180	
							39,725 [f]			
Upper Kobuk River Total		13,420	3,447	11,602	23,199		48,750 [c]		43,347	45,155
Squirrel River				[c]						
Salmon River				[c]						
Tutuksuk River				[c]						
Kobuk River System Total		13,420	3,447	11,602	23,199		48,750 [c]		43,347	45,155

-continued-

Appendix C8.–Page 6 of 6.

Stream [a]	2010 [j]	2011 [j]	2012 [j]	Goals [k]
Noatak Drainage				
Noatak River below Kelly River				
Eli River				
Kelly River & Lake				
Noatak River System Total				42,000-91,000
Kobuk Drainage				
Kobuk to Pah River				
Pah River to just below Selby River				
Selby River mouth & slough				
Selby River				
Selby R. mouth to Beaver C.				
Beaver Creek mouth				
Above Beaver Creek				
Upper Kobuk River Total				9,700-21,000
Squirrel River				4,900-10,500
Salmon River				3,300-7,200
Tutuksuk River				1,400-3,000
Kobuk River System Total				19,600-39,200

Note: The figures in these tables have been corrected and supersede figures in previous reports.

[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] These fish are unidentified salmon, mostly chum salmon.

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

[d] Unacceptable survey conditions.

[e] Irresolvable discrepancies in historical data put this figure in question.

[f] Unclear where these fish were observed.

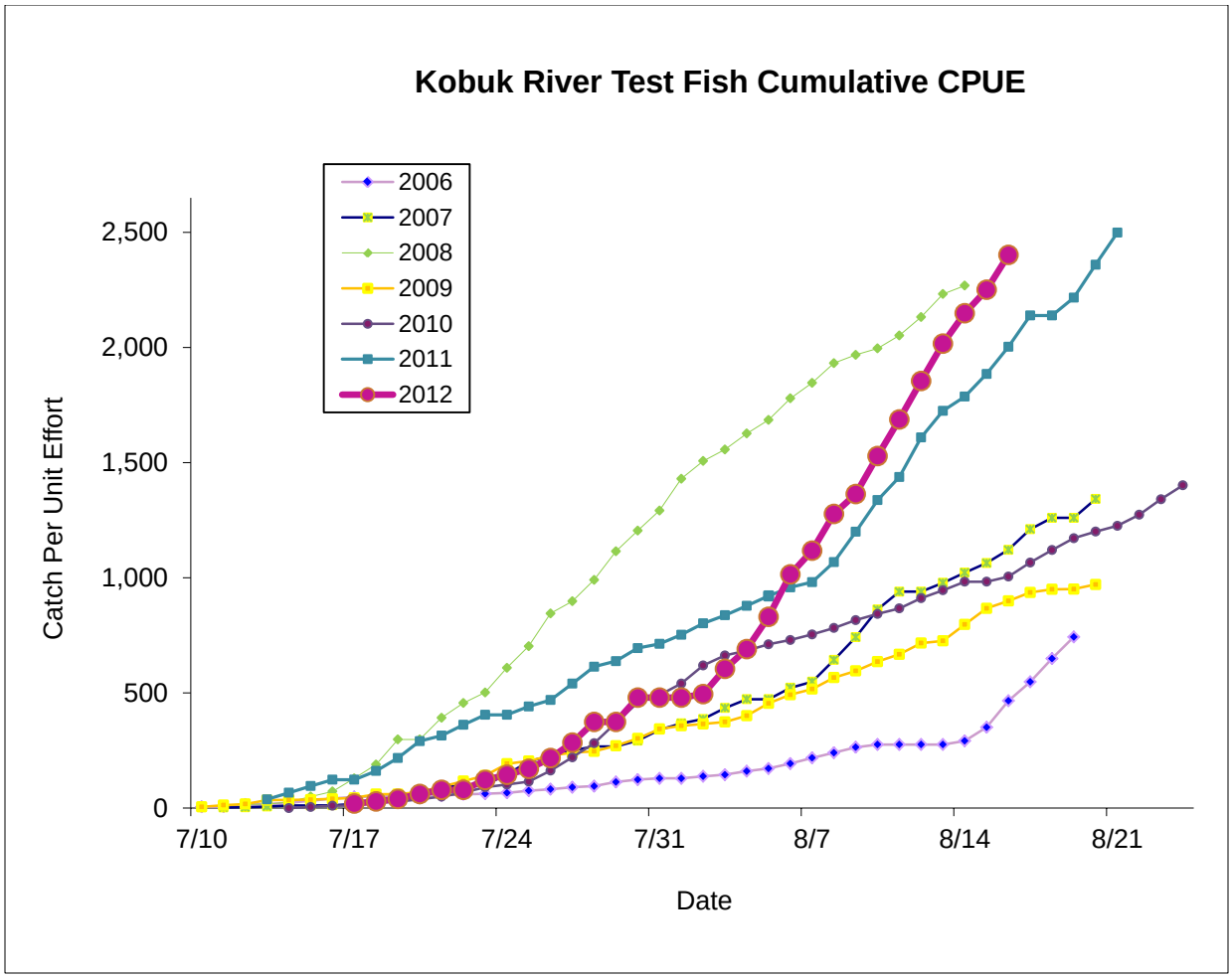
[g] Survey by foot or boat.

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

[i] Surveyed well before peak of migration.

[j] No surveys flown.

[k] Aerial survey goals were revised in 2007.



Appendix C9.–Kobuk River chum salmon drift test fish cumulative catch per unit effort (CPUE), 2006–2012.

APPENDIX D: HERRING FISHERIES

Appendix D1.–Norton Sound herring and spawn-on-kelp harvests (in tons) by U.S. commercial fishermen, 1909–2012.

Year	Sac Roe Herring	Food or Bait Herring	Total Herring	Spawn-On-Kelp
1909–1916 [a]	–	–	–	–
1916–1928	0	1,881	1,881	0
1929	0	166	166	0
1930	0	441	441	0
1931	0	86	86	0
1932	0	529	529	0
1933	0	31	31	0
1934	0	4	4	0
1935	0	15	15	0
1936	0	0	0	0
1937	0	6	6	0
1938	0	10	10	0
1939	0	6	6	0
1940	0	14	14	0
1941	0	3	3	0
1942-63	0	0	0	0
1964	20	0	0	0
1965	0	0	0	0
1966	12	0	0	0
1967	0	0	0	0
1968	0	0	0	0
1969	2	0	0	0
1970	8	0	0	0
1971	20	0	0	0
1972	17	0	0	0
1973	35	0	0	0
1974	2	0	0	0
1975	0	0	0	0
1976	9	0	0	0
1977	11	0	0	trace
1978	15	0	0	4
1979	1,292	0	0	13
1980	2,451	1	2,452	24
1981	4,371	0	0	47 [b]
1982	3,864	69	3,933	38
1983	4,181	401	4,582	29 [c]
1984	3,298	274	3,572	19 [d]
1985	3,420	128	3,548	[e]
1986	4,926	268	5,194	0
1987	3,779	303	4,082	0
1988	4,256	416	4,672	0
1989	4,494	247	4,741	0

-continued-

Year	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 [f]	0	0	0	0
1993	4,713	321	5,034	0
1994	958	2	960	0
1995	6,647	116	6,763	0
1996 [g]	6,061	109	6,220	0
1997 [h]	3,709	262	3,976	0
1998	2,623	8	2,631	9.04 [i]
1999	2,693 [j]	53	2,751	3.74
2000	4,487 [k]	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 [f]	0	11	11	0
2005	1,951	0	1,951	0
2006	646	25	671	0.57
2007 [f]	0	33	33	0.14
2008 [f]	0	91	91	0.18
2009 [f]	0	28	28	0
2010	623	65	688	0
2011	739	67	807	0
2012 [f]	0	7	7	0

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

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

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

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

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

[f] No commercial fishery took place in 1992 and no sac roe fishery took place in 2004, 2007–2009 and 2012.

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

[h] Total includes an estimated 5 st of wastage and approximately 1,000 lb taken as bait.

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

[j] Includes an estimated 5 st of wastage.

[k] Includes an estimated 15 st of wastage.

Appendix D2.–Japanese gillnet herring catches in Norton Sound, 1968–1977.

Year	Gillnet Catch (st)	Remarks
1968	131	First foreign effort on herring in Norton Sound
1969	1,400	Peak catch with large effort (about 40 ships). 2 vessels apprehended.
1970	69	
1971	703	
1972	15	
1973	38	
1974	764	
1975		Data unavailable
1976		Data unavailable.
1977		Herring fishery closed to foreign nations.

Note: Catches are north of 63 N latitude and east of 167 W longitude.

Appendix D3.–Commercial herring fishery summary information, Norton Sound District, 1979–2012.

Year	Estimated Biomass (tons)	Catch Gillnet (tons)	Beach Seine (tons)	Wild Kelp (tons)	*Macrocystis* Kelp (lb)	Number of Fishermen	Dollar Value (millions)	Number of Buyers	Average Roe %	Peak Catch Day	Fishery Duration
1979	7,700	1,292	0	13.00		67	0.60	7	7.0	5/25	5/19-06/14
1980	8,400	2,452	0	24.00		294	0.50	8	8.1	5/30	5/21-06/05
1981	25,100	4,371	0	47.00		332	1.50	13	8.8	5/24	5/18-05/28
1982	19,403	3,933	0	38.00		237	1.00	7	8.8	6/08	6/03-06/11
1983	28,100	4,541	41	29.00		272	1.40	9	8.6	5/23	5/18-05/28
1984	23,100	3,245	327	16.00	6,000	194	0.90	8	10.3	6/10	5/28-06/06
1985	20,000	3,379	169			277	1.40	11	9.9	6/20	6/13-06/21
1986	28,100	4,979	215			323	2.90	10	9.6	6/09	6/03-06/10
1987	32,370	3,759	323			564	2.60	11	8.6	6/07	6/07-06/08
1988	33,924	4,474	198			348	3.90	11	9.0	5/28	5/27-05/31
1989	25,981	4,351	390			357	2.30	9	9.2	5/28	5/27-05/30
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]				0.00			6/20 [b]	
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	6/08	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	0		0	4	0.00	0	[a]	5/24 [b]	
2005	43,013	1,951	0		0	56	0.32	1	11.4	6/04	6/03-06/10

-continued-

Year	Estimated Biomass (tons)		Catch Gillnet (tons)		Beach Seine (tons)	Wild Kelp (tons)	*Macrocystis* Kelp (lb)	Number of Fishermen	Dollar Value (millions)	Number of Buyers	Average Roe %	Peak Catch Day	Fishery Duration
2006	38,833	[c]	671	[d]	0	0.57	0	41	0.14	1	10.2	6/09	6/08-06/11
2007 [a]	38,415	[c]	33		0	0.14	0	7	0.02	1	[a]	6/09	6/09-06/15
2008 [a]	37,401	[c]	91		0		0	14	0.18	1	[a]	6/11	6/10-06/24
2009 [a]	36,917	[c]	28		0		0	6	0.02	1	[a]	6/12	6/12-06/15
2010	42,889	[c]	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	[c]	7		0		0	8	0.01	1	0.00	6/25	6/16-06/25

[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 one or 2 days prior to peak catch. The 2004 catch was by king crab permit holders for bait.

[c] Conditions did not allow for a peak survey; therefore, biomass was estimated by extrapolation.

[d] Twenty-five tons out of total sac roe herring catch was sold off as bait to NSEDC.

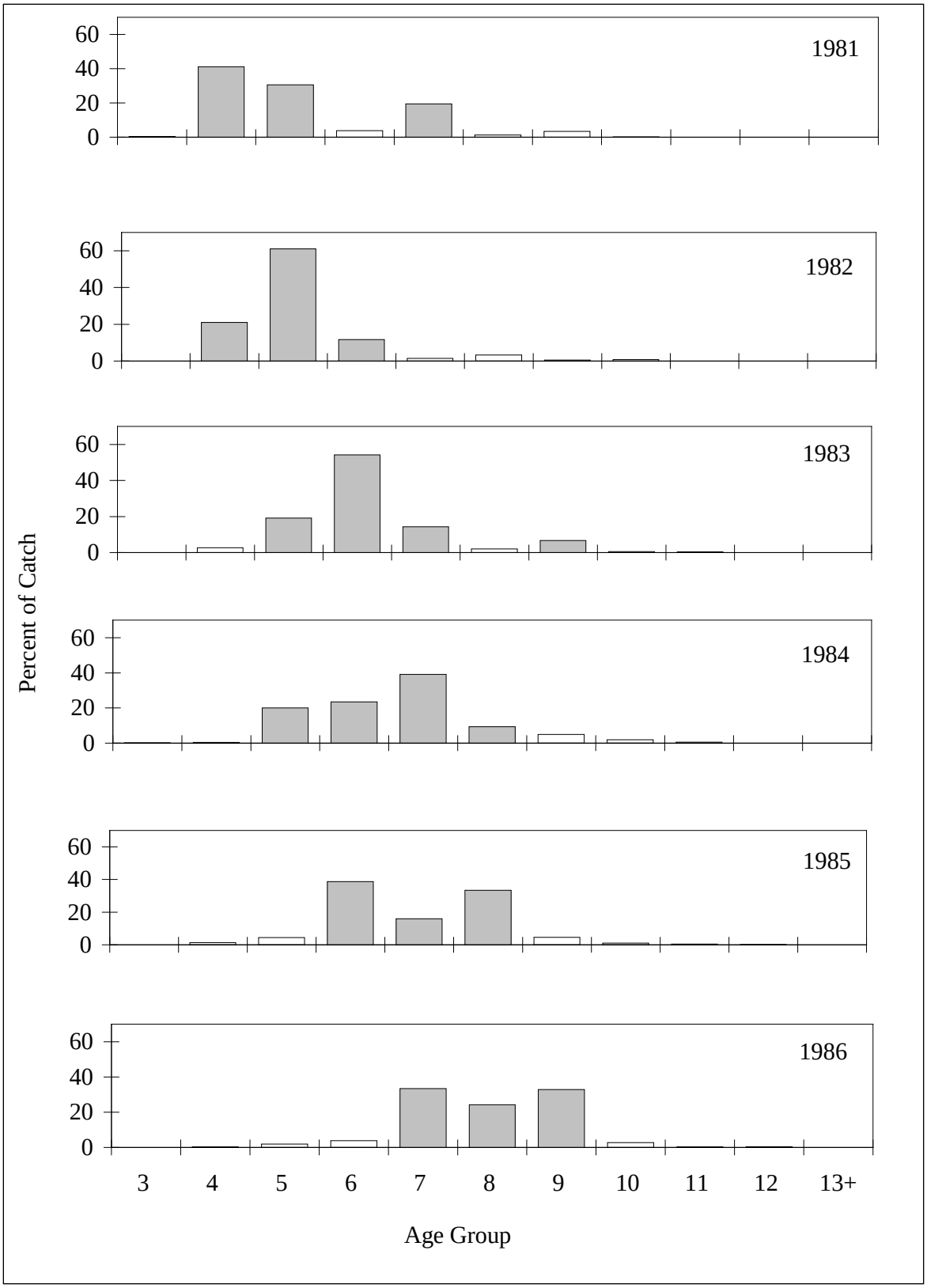
Appendix D4.–Norton Sound commercial herring harvest (tons) by subdistrict, by year, 1979–2012.

	Subdistricts							
Year [a]	1	2	3	4	5	6	7	Totals
1979	319	405	555	0	0	0	14	1,293
1980	1,176	632	632	5	0	7	0	2,452
1981	3,068	831	471	1	0	0	0	4,371
1982	2,062	946	925	0	0	0	0	3,933
1983	434	1,265	2,733	0	65	85	0	4,582
1984	–	–	3,572	0	0	0	0	3,572
1985	1,538	188	1,675	0	147	0	0	3,548 [b]
1986	2,559	–	2,450	0	185	0	0	5,194
1987	2,218	174	1,690	0	0	0	0	4,082
1988	3,260	99	1,307	0	6	0	0	4,672
1989	3,256	60	1,425	0	0	0	0	4,741 [c]
1990	4,498	950	931	0	0	0	0	6,379 [d]
1991	0	880	4,792	0	0	0	0	5,672 [e]
1992 [f]	0	0	0	0	0	0	0	0
1993	2,288	587	1,881	0	278	0	0	5,034 [g]
1994	250	36	634	0	40	0	0	960
1995	2,359	604	1,524	0	2,108	167	0	6,762
1996	3,074	111	2,831	0	153	0	0	6,170 [h]
1997	2,046	62	1,864	0	0	0	1 [i]	3,976 [j]
1998	1,543	0	1,081	0	0	0	0	2,624
1999	285	323	2,050	0	0	0	8	2,746 [k]
2000 [l]	2,623	81	1,767	0	0	0	0	4,471
2001 [l]	898	0	1,347	0	0	0	0	2,245
2002 [l]	373	0	750	0	0	0	0	1,123
2003 [l]	283	0	1,325	0	0	0	0	1,608
2004	0	0	0	0	0	0	11	11
2005 [l]	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

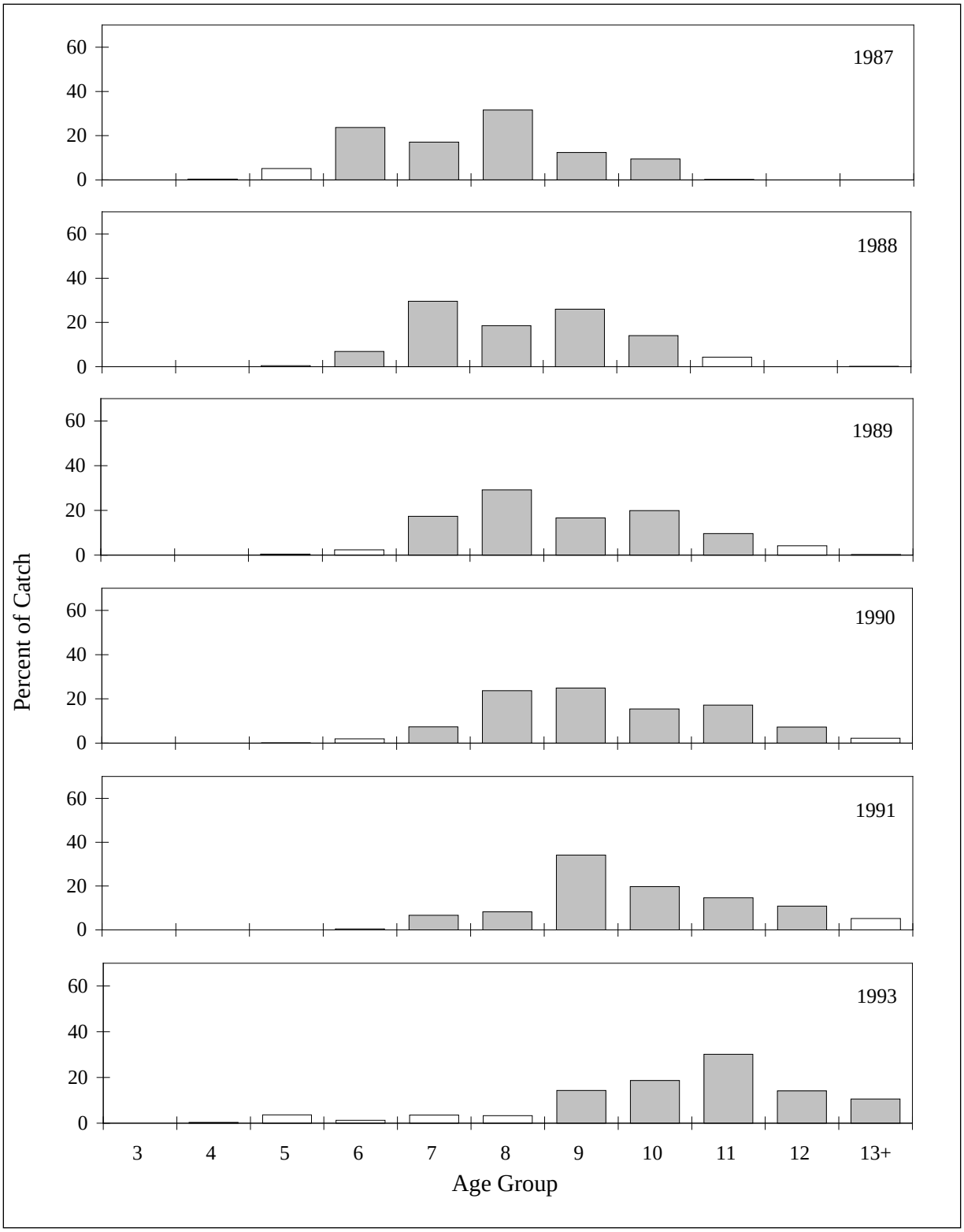
[a] Includes herring taken for sac roe and bait.
[b] Does not include an estimated 90 st of wastage.
[c] Does not include an estimated wastage of 30 st in abandoned gillnets.
[d] Does not include an estimated wastage of 60 st in abandoned gillnets.
[e] Does not include an estimated wastage of 125 st in abandoned gillnets.
[f] No commercial fishery in 1992.
[g] Does not include an estimated wastage of 45 st in abandoned beach seine sets.
[h] Does not include an estimated 50 st of wastage.
[i] Approximately 1,000 lb of herring bait was taken under 5 AAC 27.971 in June (not during sac roe fishery).
[j] Does not include an estimated 5 st of wastage.
[k] 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.
[l] There was 10% added to sac roe total due to dewatering by buyers.

Appendix D5.–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

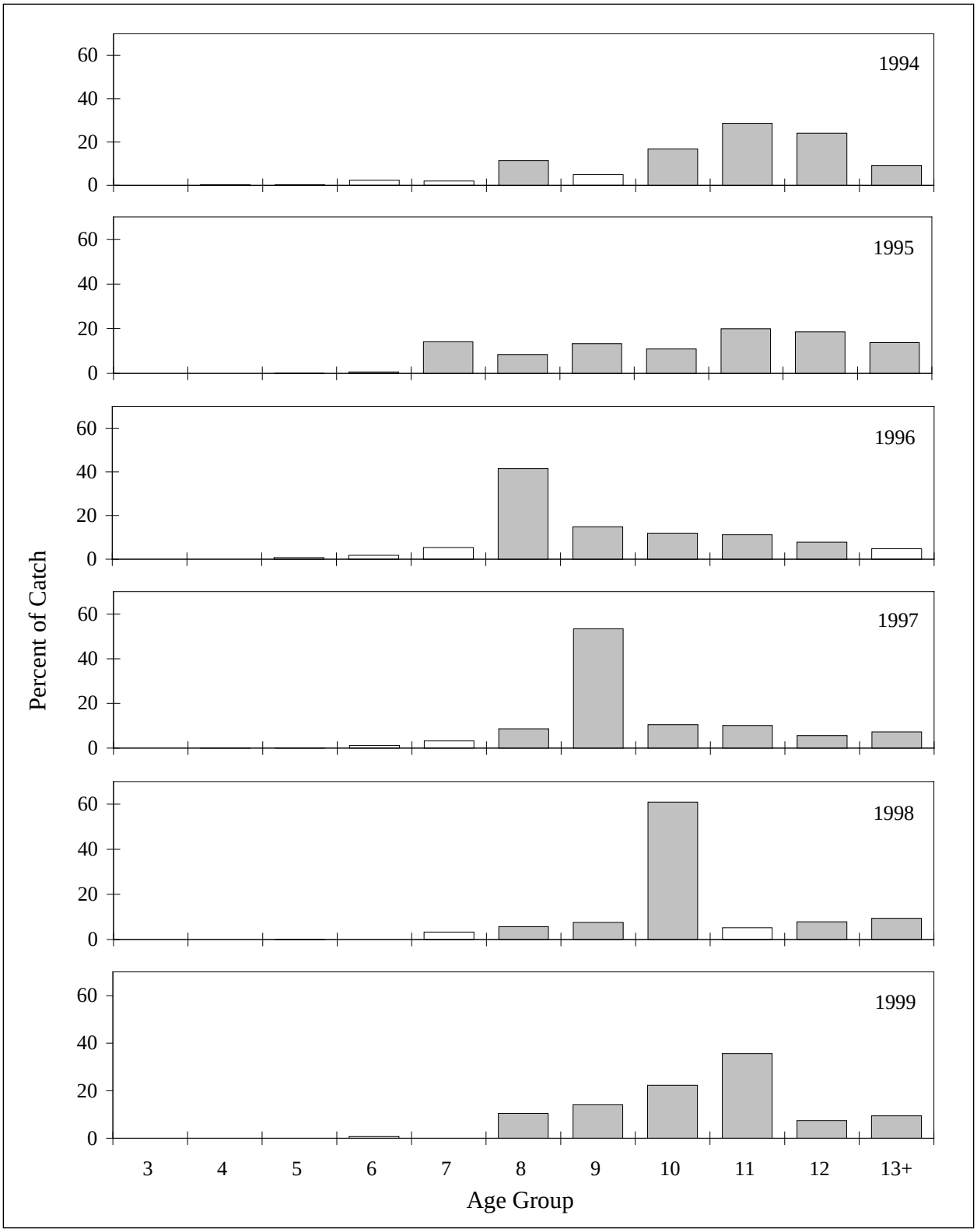


Appendix D6.–Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1981–1986.



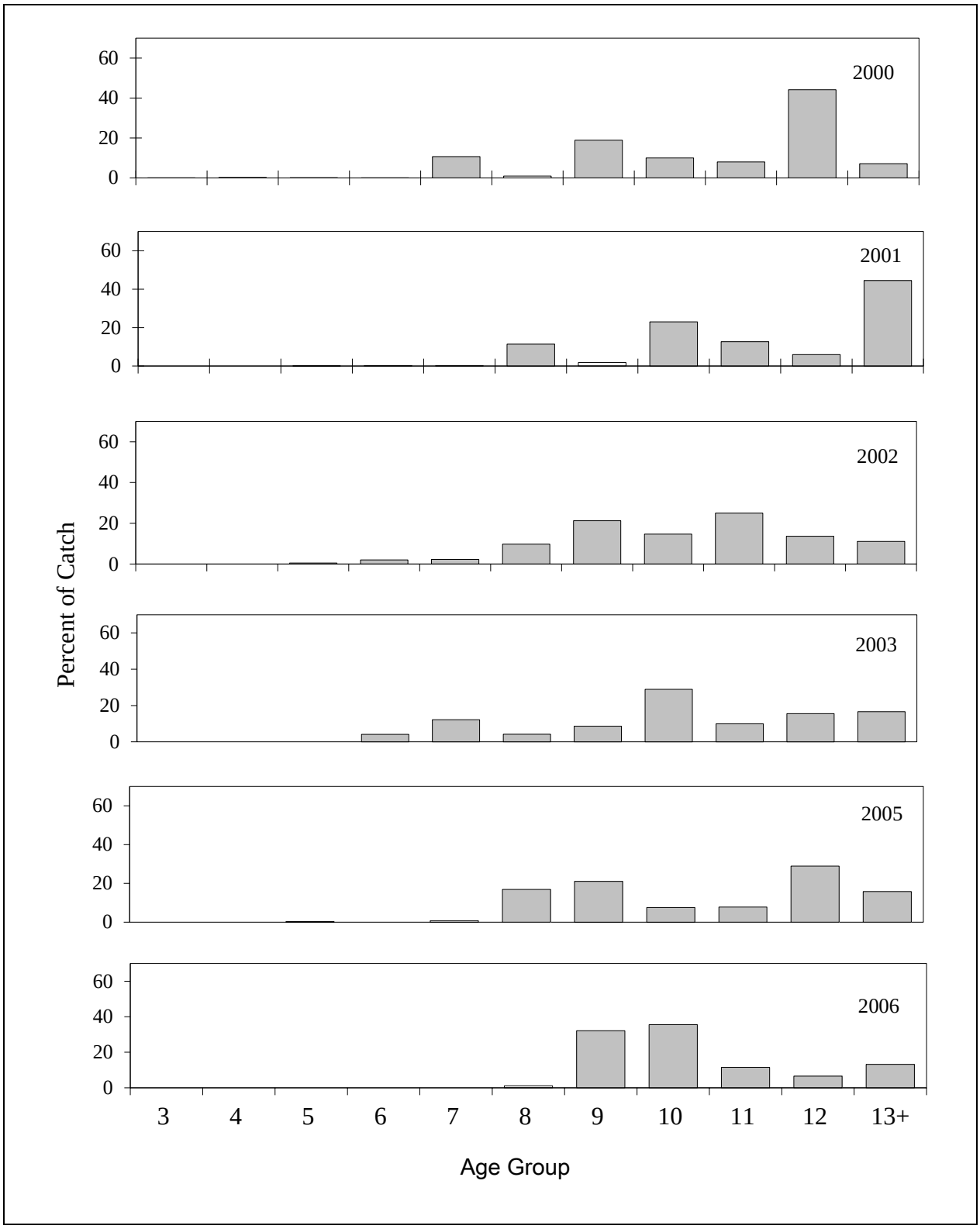
Note: No commercial fishing occurred in 1992.

Appendix D7.–Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1987–1993.



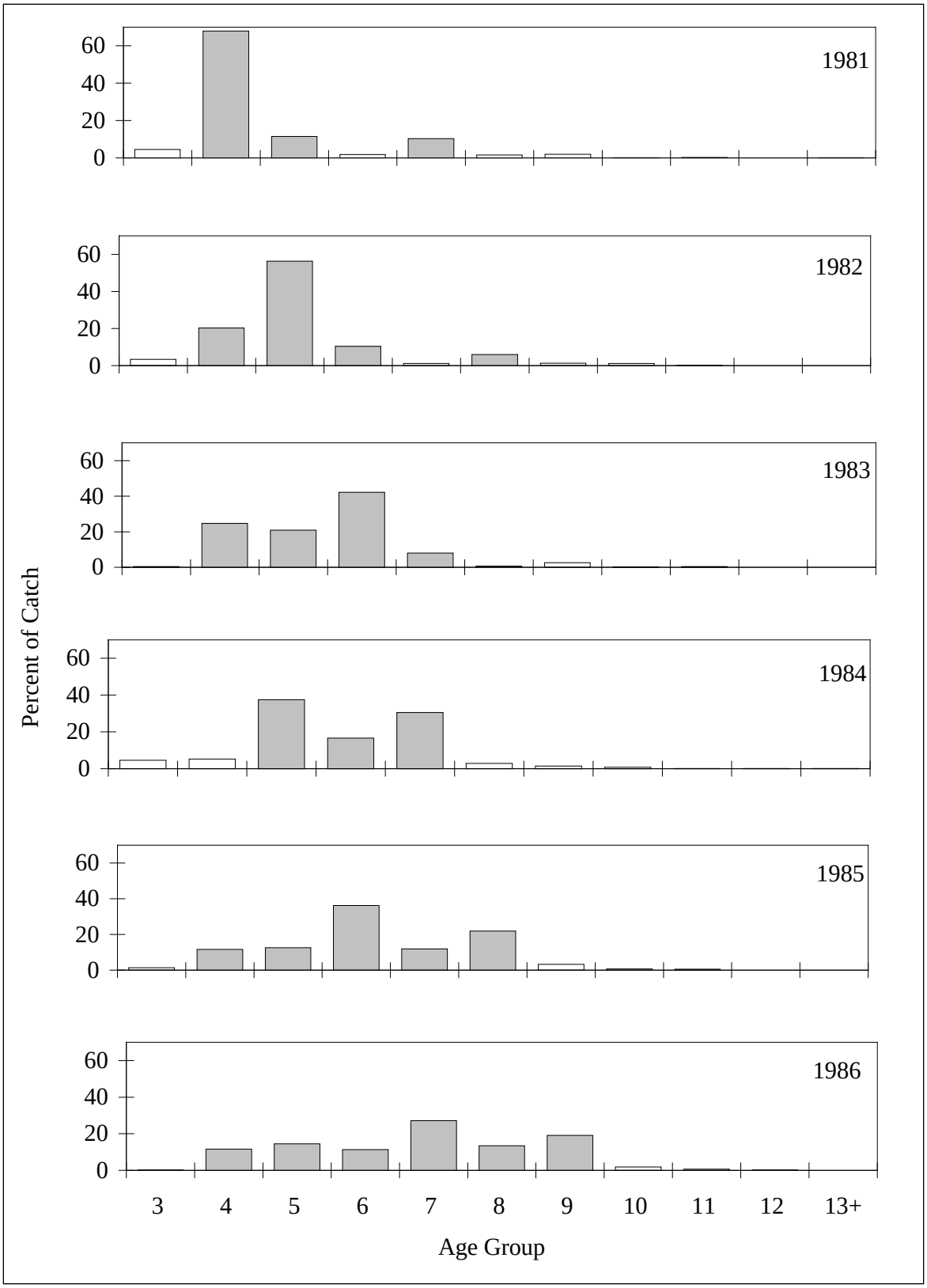
Note: No commercial catch from beach seine gear in 1998 and 1999.

Appendix D8.–Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1994–1999.

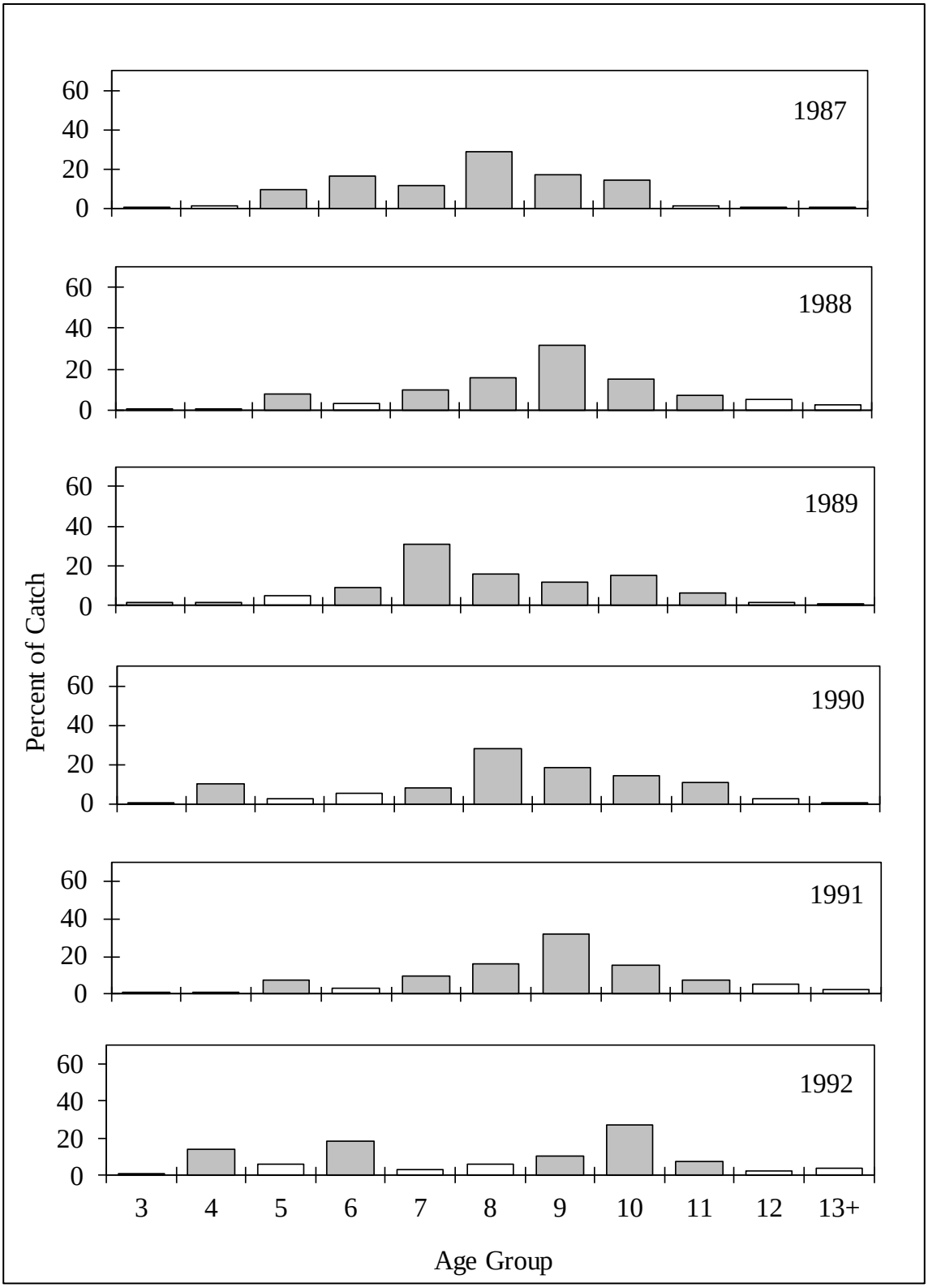


Note: No commercial catch from beach seine gear in 2001–2006. No fishery in 2004.

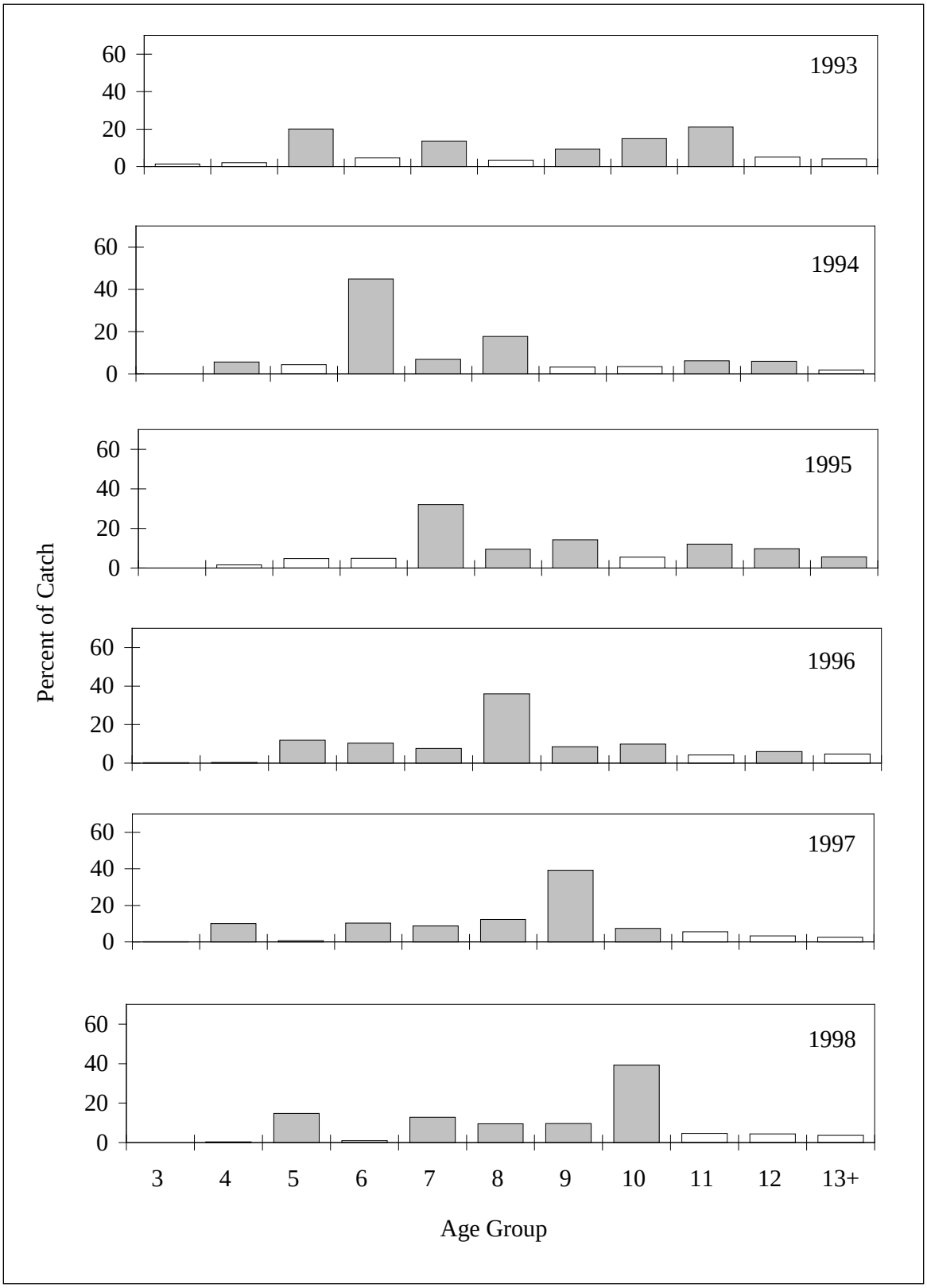
Appendix D9.–Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 2000–2006.



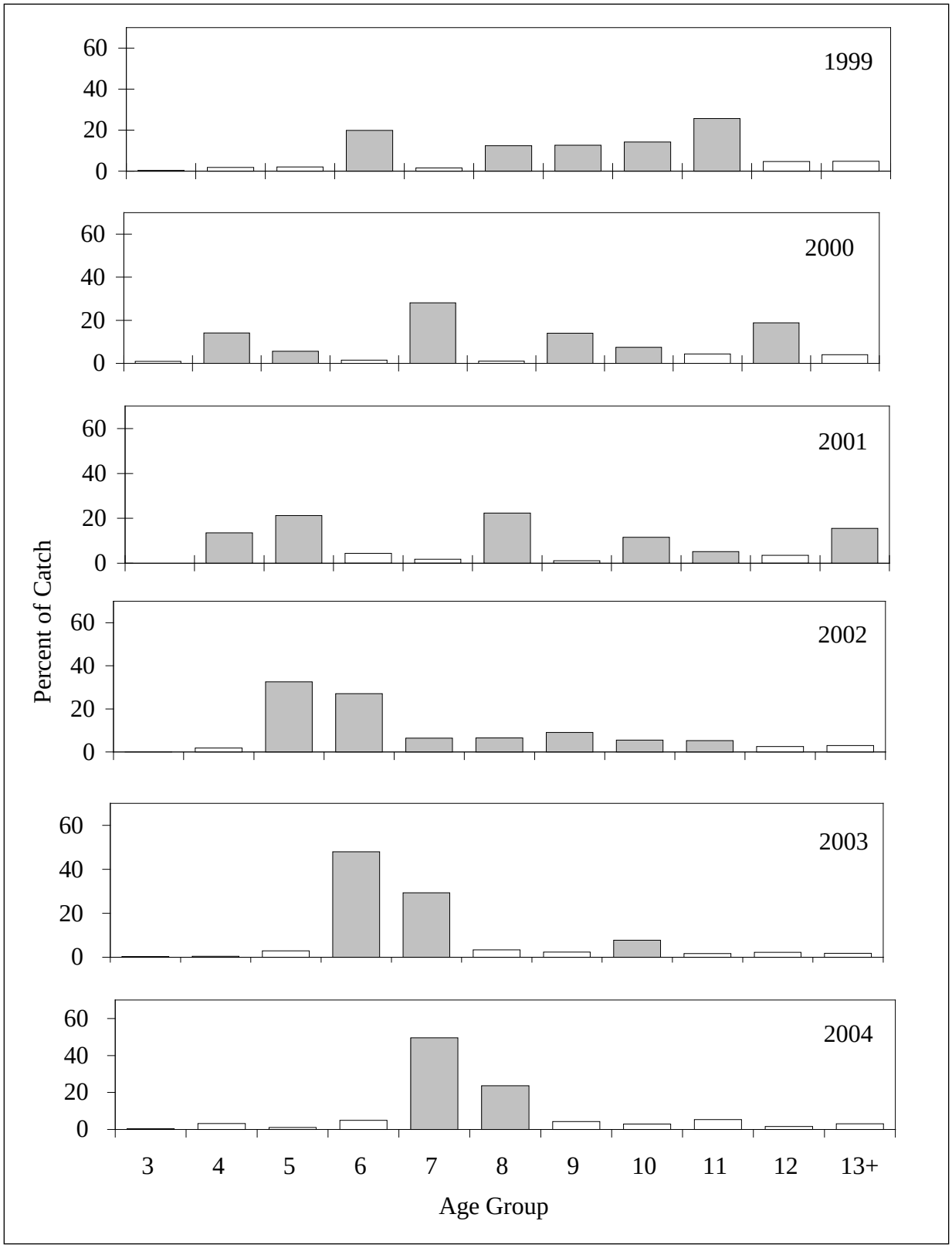
Appendix D10.–Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1981–1986.



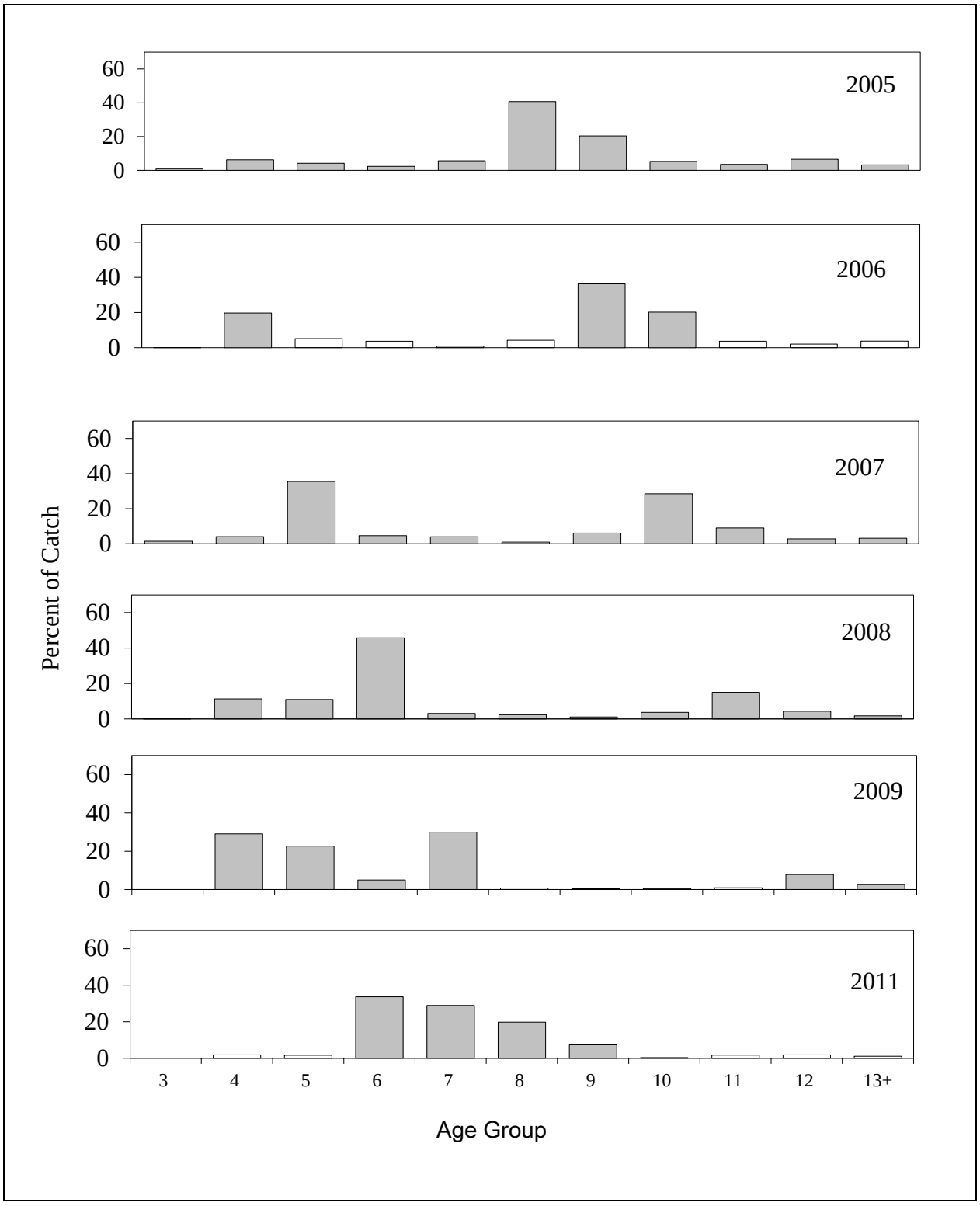
Appendix D11.–Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1987–1992.



Appendix D12.–Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1993–1998.

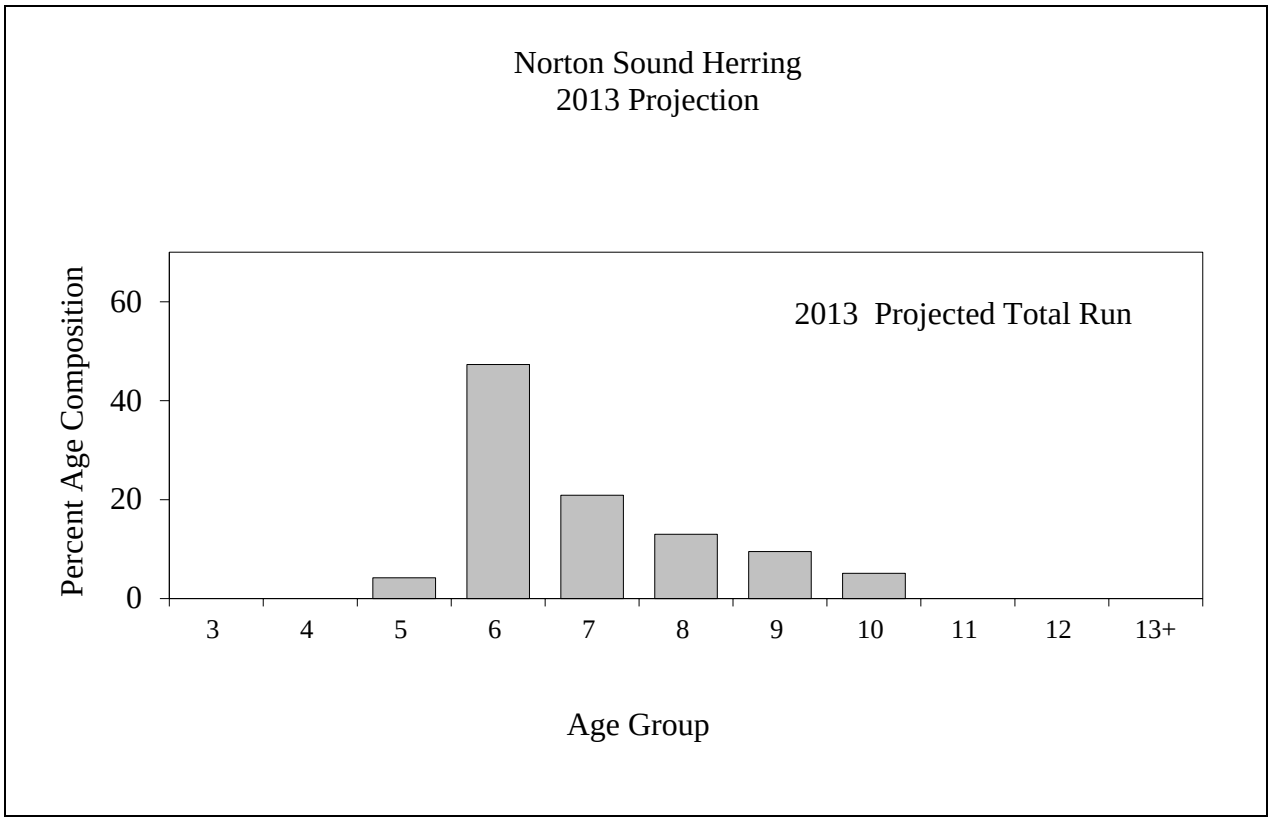


Appendix D13.–Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1999–2004.



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

Appendix D14.–Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 2005–2011.



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

Appendix D15.–Norton Sound Pacific herring projected age composition of the 2013 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, 1977–2012 (catch in pounds).

Statistical Area	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
616331	7,893									
616401										
626331	40,020					22				
626401	31,572			4,830	399					
626402	38,995									
636330										
636401				12,398	61,823	32,246	5,880	41	891	
636402										
646301										
646330					4,716					
646401			155,972		1,319	17,532				
646402	80,969					748				
656300			161,699		15,174					
656330			323,518	72,735	395,662	3,983	24,246	83,479	7,632	
656401			138,011	121,147	253,387	60,480	11,422	183,119	246,200	
656402	306,302	90,187	288,869	918	3,098	2,832			132,363	
666230		55,490			77					
666300		162,795	60,816	84,874	9,167	95		4,534		
666330		353,016	505,050	367,446	141,513	8,990	1,192		389	70,615
666401		179,212	486,947	205,400	381,510	79,580	325,045	116,254	5,341	408,848
666402	12,036	515,778	534,938	183,581		17,585			32,992	
666431			146,029							
676300		13,238		126,231						
676330		51,304	81,798	6,762	18,734					
676400		667,130	33,856	274	92,026	1,315	247		32	
676430		3,811	12,309		373	3,513			1,171	
676501					36					
686330			1,860							
686431										
Total (tons)	259	1,046	1,466	593	690	114	184	194	214	240

-continued-

Appendix E1.–Page 2 of 4.

Statistical Area	1987	1988	1989	1990	1992	1993	1994	1995	1996 [a]	1997
616331							48			
616401								35		
626331									61	
626401								18,971	45,045	18,066
626402										
636330									4,560	3,838
636401			22,030		1,159	1,373	3,340	24,329	70,677	59,206
636402							1,754	3,466		
646301								4,628	13,888	
646330			5,212					1,493	2,894	314
646401						1,963	37,510	105,045	22,834	1,052
646402						730	139,661	66,821		
656300										
656330	79,006	36,129	1,757		4,814	265		19,745	15,446	4,661
656401	194,408	165,644	100,956	171	53,119	105,341	34,686	32,289	9,985	4,035
656402						193,079	110,289	44,000		
666230										
666300									25,519	
666330	2,963	13,020	1,275	27,185	4,305	31,758		730		
666401	50,744	21,895	115,257	162,263	10,632	746	396		3,001	1,816
666402						535	1,221			
666431								1,124		
676300									546	
676330										
676400				3,212					9,775	
676430										
676501										
686330										
686431										
Total (tons)	164	118	123	96	37	168	164	161	112	46

-continued-

Statistical Area	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
616331		633	4,557		3,506	646			2,357	
616401										231
626331					2,455				1,415	27,018
626401	8,065	508	4,689	61,620	53,722	15,899	23,113	94,130	118,202	61,704
626402						1,352				
636330	2,449			2,253				126	26,680	10,253
636401	10,771	14,201	130,463	91,343	50,906	83,949	166,489	227,204	224,531	123,092
636402										
646301										
646330		3,021		1,868	1,955		2,226	4,097	2,629	5,290
646401	3,194	221		4,287		3,952	1,964	149	1,660	
646402										
656300						14	932		284	1,909
656330	4,078	1,300	1,990	20,869	12,374	21,176	46,288	47,411	17,752	4,911
656401	1,127	2,739	95,979	55,158	63,038	40,566	21,579	9,405	28,434	70,065
656402						1,441		380	807	2,254
666230									1,721	
666300									18,245	
666330			5,839	7,030	1,332	1,296	12,359	142	5,041	511
666401		930	69,007	43,771	35,970	83,998	42,452	727	600	2,498
666402					30,070	12,873	23,344	16,025	1,050	2,959
666431					4,274	45				
676300										
676330										
676400										180
676430										
676501								1,008		
686330										
686431									340	
Total (tons)	15	12	156	144	130	134	170	200	226	156

-continued-

Statistical Area	2008	2009	2010	2011	2012	Total
616331	5,658	888				26,186
616401	416	6,170				6,852
626331	3,235	3,047		2,489		79,762
626401	96,327	103,043	52,054	85,271	115,524	1,012,754
626402						40,347
636330	2,350	5,026	2,584		1,454	61,573
636401	197,948	96,279	182,040	146,973	148,183	2,189,765
636402						5,220
646301						18,516
646330	1,505	933	1,205		1,204	40,563
646401	18,728	46,264	77,437	83,099	98,811	682,993
646402						288,929
656300						180,012
656330		10,617	17,660	1,546	8,168	1,289,218
656401	68,968	107,557	82,747	77,149	85,920	2,524,830
656402						1,176,819
666230						57,288
666300						366,045
666330		1,514		2,042	1,000	1,567,553
666401		10,021			15,726	2,860,587
666402		6,228	1,577	2,271		1,395,063
666431						151,472
676300						140,015
676330						158,598
676400						808,047
676430						21,177
676501						1,044
686330						1,860
686431						340
Total (tons)	198	199	209	200	238	8,577

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 Number of crab [a] Pre-2 males [b]	Pre-1 Males [b]	Legal Males [c]	Legal Male Biomass (millions of pounds)
1976	9/02–09/05 9/16–10/07	NMFS	Trawl	331,555	808,091	1,742,755	5,228,265
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 males were defined as 76–89 mm in carapace length (CL) and pre-one males were defined as 90–104 mm in CL.

[c] Legal male red king crabs 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 males 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 males as at least 100 mm CL).

[d] Pre-2 male and pre-one male 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 an under-reporting of recovered tagged crab.

Appendix E3.–Historical summer commercial red king crab fishery economic performance, Norton Sound Section, Eastern Bering Sea, 1977–2012.

Year	Guideline Harvest Level (lb) [b]	Legal Male Population Est. No. crab (millions)	Legal Male Population Est. lb [b]	Commercial Harvest (lb) [a, b] Open Access	Commercial Harvest (lb) [a, b] CDQ	Total Number of Vessels	Total Number of Permits	Total Number of Landings	Total Number of Pots Registered	Total Number of Pots Pulls	Total Exvessel Price/lb	Total Fishery Value (millions $)	Season Length Days	Season Length Dates
1977	[c]	1.7	5.1	0.52		7	7	13	[c]	5,457	0.75	0.229	60	[c]
1978	3.00			2.09		8	8	54	[c]	10,817	0.95	1.897	60	6/07–8/15
1979	3.00	0.8	2.4	2.93		34	34	76	[c]	34,773	0.75	1.878	16	7/15–7/31
1980	1.00	1.9	5.7	1.19		9	9	50	[c]	11,199	0.75	0.890	16	7/15–7/31
1981	2.50	1.2	3.6	1.38		36	36	108	[c]	33,745	0.85	1.172	38	7/15–8/22
1982	0.50	0.9	2.7	0.23		11	11	33	[c]	11,230	2.00	0.405	23	8/09–9/01
1983	0.30			0.37		23	23	26	3,583	11,195	1.50	0.537	4	8/01–8/05
1984	0.40			0.39		8	8	21	1,245	9,706	1.02	0.395	14	8/01–8/15
1985	0.45	1.1	3.3	0.43		6	6	72	1,116	13,209	1.00	0.427	22	8/01–8/23
1986	0.42			0.48		3	3	[c]	578	4,284	1.25	0.600	13	8/01–8/25 [d]
1987	0.40			0.33		9	9	[c]	1,430	10,258	1.50	0.491	11	8/01–8/12
1988	0.20	1.0	3.0	0.24		2	2	[c]	360	2,350	[c]	[c]	10	8/01–8/11
1989	0.20			0.25		10	10	[c]	2,555	5,149	3.00	0.739	3	8/01–8/04
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 [e]
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 [f]
1997	0.08			0.09		13	15	100	520	2,982	1.98	0.184	44	7/01–8/13 [g]
1998	0.08			0.03	0.00	8	11	50	360	1,639	1.47	0.041	65	7/01–9/03 [h]
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 [i]
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 [j]

-continued-

Year	Guideline Harvest Level (lb) [b]	Legal Male Population Est. No. crab (millions)	Legal Male Population Est. lb [b]	Commercial Harvest (lb) [a, b] Open Access	Commercial Harvest (lb) [a, b] CDQ	Total Number of Vessels	Total Number of Permits	Total Number of Landings	Total Number of Pots Registered	Total Number of Pots Pulls	Total Exvessel Price/lb	Total Fishery Value (millions $)	Season Length Days	Season Length Dates
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 [k]
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 [l]
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 [m]
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 [n]
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 [o]
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 [n]
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 [n]
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 [p]
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 [q]
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 [r]
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 [s]
2012	0.47	1.4	3.7	0.44	0.03	29	29	289	1,040	10,041	5.41	2.556	72	6/29–9/08 [t]

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

[b] Millions of pounds.

[c] Information not available.

[d] Fishing actually began 8/12.

[e] Fishing actually began 7/8.

[f] Fishing began 7/9 due to fishermen strike.

[g] First delivery was made 7/10.

[h] First delivery was made 7/16.

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

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

[k] OA closed 9/1. CDQ fishery opened 9/1–9/9.

[l] OA was 7/1–8/6. CDQ fishery opened 6/15–6/28 and 8/9–9/3.

[m] OA was 7/1–8/13. CDQ fishery opened 6/15–6/28 and 8/15–8/24

[n] CDQ fishery opened 6/15–6/28. OA opened 7/1 to the end date.

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

[p] OA opened 6/23–8/18. CDQ opened 8/17–9/3.

[q] CDQ opened 6/15 – 7/28. OA opened 6/15 to the end date.

[r] CDQ opened 6/28 – 7/16. OA opened 7/1 to the end date.

[s] CDQ opened 6/28 – 7/8. OA opened 6/28 to the end date.

[t] CDQ opened 6/29 to the end date. OA opened 6/29–8/11.

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, 1977–2012.

Year	Recruits [a]	Postrecruits [b]
1977	53	47
1978	29	71
1979	33	67
1980	15	85
1981	10	90
1982	27	73
1983	55	45
1984	59	41
1985	45	55
1986	49	51
1987	22	78
1988	25	75
1989	23	77
1990	21	79
1991 [c]	-	-
1992	28	72
1993	31	69
1994	20	80
1995	36	64
1996	30	70
1997	49	51
1998	32	68
1999	42	58
2000	41	60
2001	33	67
2002	33	67
2003	48	52
2004	49	51
2005	36	64
2006	25	75
2007	45	55
2008	45	55
2009	43	57
2010	49	51
2011	43	57
2012	33	67

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

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

[c] No summer commercial fishery.

Appendix E5.–Winter commercial and subsistence red king crab harvests, Norton Sound, Eastern Bering Sea, 1978–2012.

Commercial			Subsistence						
Year [a]	Number of Fishermen	Number 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
1978	37	9,625	1977-78	290	206	149	[e]	12,506	84
1979	[f]	[f]	1978-79	48	43	38	[e]	224	6
1980	[f]	[f]	1979-80	22	14	9	[e]	213	24
1981	0	0	1980-81	51	39	23	[e]	360	16
1982	[f]	[f]	1981-82	101	76	54	[e]	1,288	24
1983	5	549	1982-83	172	106	85	[e]	10,432	123
1984	8	856	1983-84	222	183	143	15,923	11,220	78
1985	9	1,168	1984-85	203	166	132	10,757	8,377	63
1986	5	2,168	1985-86	136	133	107	10,751	7,052	66
1987	7	1,040	1986-87	138	134	98	7,406	5,772	59
1988	10	425	1987-88	71	58	40	3,573	2,724	68
1989	5	403	1988-89	139	115	94	7,945	6,126	65
1990	13	3,626	1989-90	136	118	107	16,635	12,152	114
1991	11	3,800	1990-91	119	104	79	9,295	7,366	93
1992	13	7,478	1991-92	158	105	105	15,051	11,736	112
1993	8	1,788	1992-93	88	79	37	1,193	1,097	30
1994	25	5,753	1993-94	118	95	71	4,894	4,113	58
1995	42	7,538	1994-95	166	131	97	7,777	5,426	56
1996	9	1,778	1995-96	84	44	35	2,936	1,679	48
1997	[f]	[f]	1996-97	38	22	13	1,617	745	57
1998	5	984	1997-98	94	73	64	20,327	8,622	135
1999	5	2,714	1998-99	95	80	71	10,651	7,533	106
2000	10	3,045	1999-00	98	64	52	9,816	5,723	107
Avg 1978-2011	9	2,665	Avg 1977-2011	120	97	73	8,941	5,458	66

-continued-

Appendix E5.–Page 2 of 2.

Commercial			Subsistence						
Year [a]	Number of Fishermen	Number 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
2001	3	1,098	2000-01	50	27	12	366	256	21
2002	11	2,591	2001-02	114	101	67	8,805	3,669	55
2003	13	6,853	2002-03	107	73	64	9,052	4,140	65
2004 [g]	2	522	2003-04	96	77	41	1,775	1,181	29
2005	4	2,121	2004-05 [h]	170	102	60	6,496	3,973	66
2006	1	[f]	2005-06	98	97	67	2,083	1,239	18
2007	8	3,313	2006-07	129	127	116	21,444	10,690	92
2008	9	5,796	2007-08	139	137	108	18,621	9,485	88
2009	7	4,951	2008-09	105	105	70	6,971	4,752	68
2010	10	4,834	2009-10	125	123	85	9,004	7,044	83
2011	9	3,365	2010-11	148	148	95	9,183	6,640	70
2012	35	9,157	2011-12	204	204	138	11,341	7,371	53
Avg 1978-2011	9	2,665	Avg 1977-2011	120	97	73	8,941	5,458	66

[a] Prior to 1985 the winter commercial fishery occurred from January 1 to April 30; as of March 1985, 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 returned.

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

[e] Information not available.

[f] Confidential under AS 16.05.815.

[g] Confidentiality was waived by the fishermen.

[h] 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, 2004–2012.

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
Avg. 2007-2011	28	28	15	2,045	1,231	96

Appendix E7.–Number of crab pots lost during the subsistence and commercial winter crab fisheries, and ADF&G winter studies, 2006–2012.

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

Appendix E8.–Size composition by percent of red king crab from winter research pots near Nome, Norton Sound, Eastern Bering Sea, 1983–2012.

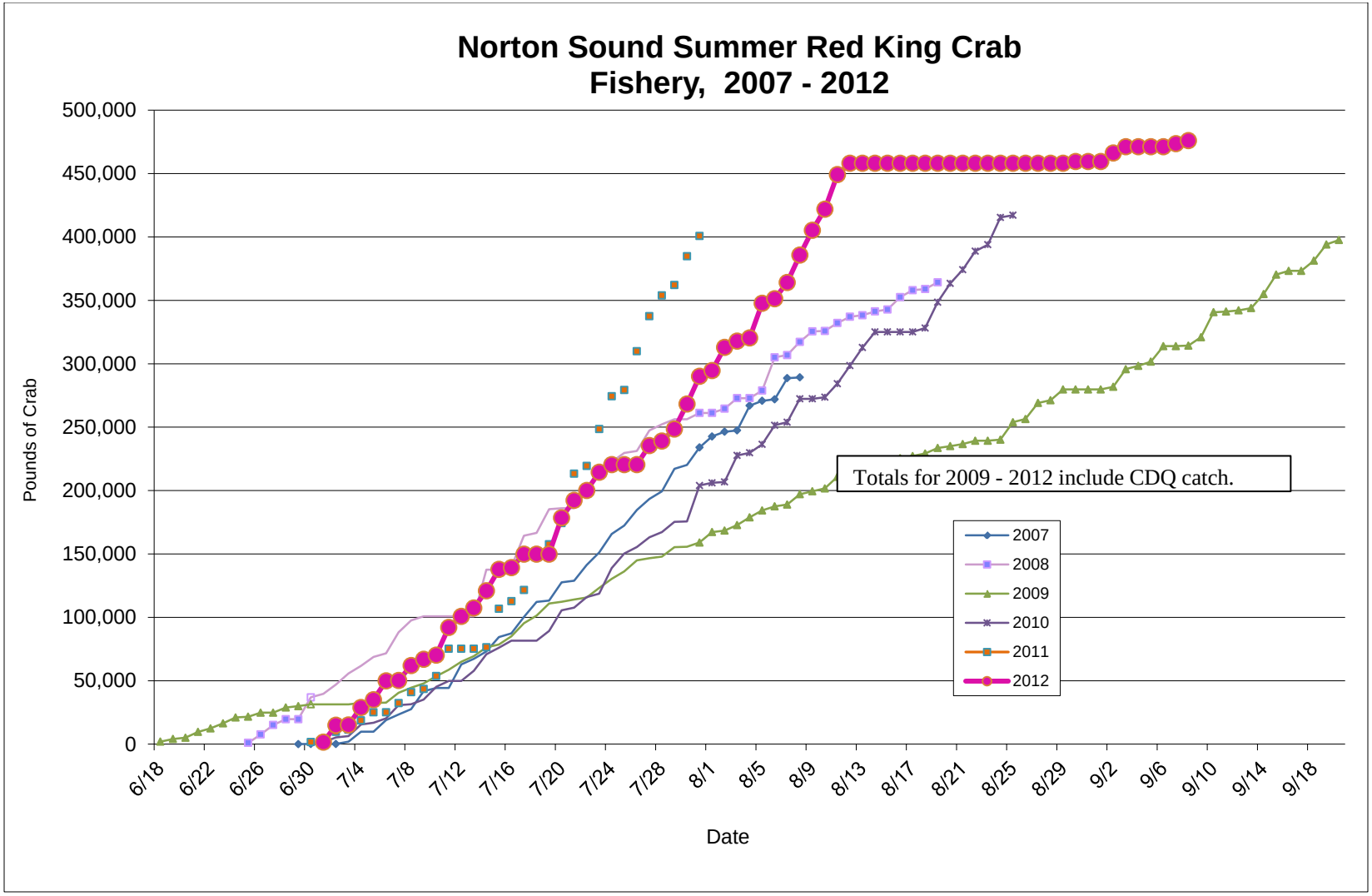
	Sublegal [a]			Legal [a]		
Year	Prerecruit Twos	Prerecruit Ones	Total	Recruits	Post-Recruits	Total
1983	26	38	64	26	10	36
1984	35	31	66	19	16	35
1985	25	45	70	20	10	30
1986	26	35	61	22	17	39
1987	13	31	44	11	45	56
1988 [b]	ND	ND	ND	ND	ND	ND
1989	27	15	42	27	31	58
1990	16	33	49	25	26	51
1991	5	30	36	34	31	65
1992 [c]	ND	ND	ND	ND	ND	ND
1993	3	9	12	17	71	88
1994 [c]	ND	ND	ND	ND	ND	ND
1995	10	11	23 [d]	32	45	77
1996	22	33	64 [d]	10	26	36
1997	32	21	64 [d]	14	22	36
1998	36	44	82 [d]	9	9	18
1999	7	42	50 [d]	39	11	50
2000	16	20	37 [d]	39	25	64
2001	23	16	39 [d]	14	48	61
2002	43	26	79 [d]	9	12	21
2003	20	42	66 [d]	20	14	34
2004	9	40	50 [d]	37	13	50
2005	16	24	41 [d]	25	34	59
2006	29	33	63 [d]	16	22	38
2007	16	53	78 [d]	11	11	22
2008	36	31	71 [d]	18	12	30
2009	11	42	54 [d]	24	22	46
2010	10	32	43 [d]	30	27	57
2011	15	26	44 [d]	23	33	56
2012	25	29	57 [d]	14	29	43

[a] Sublegals = male crabs < 4.75 in carapace width. Legals = male king crabs ≥ 4.75 in carapace width.

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

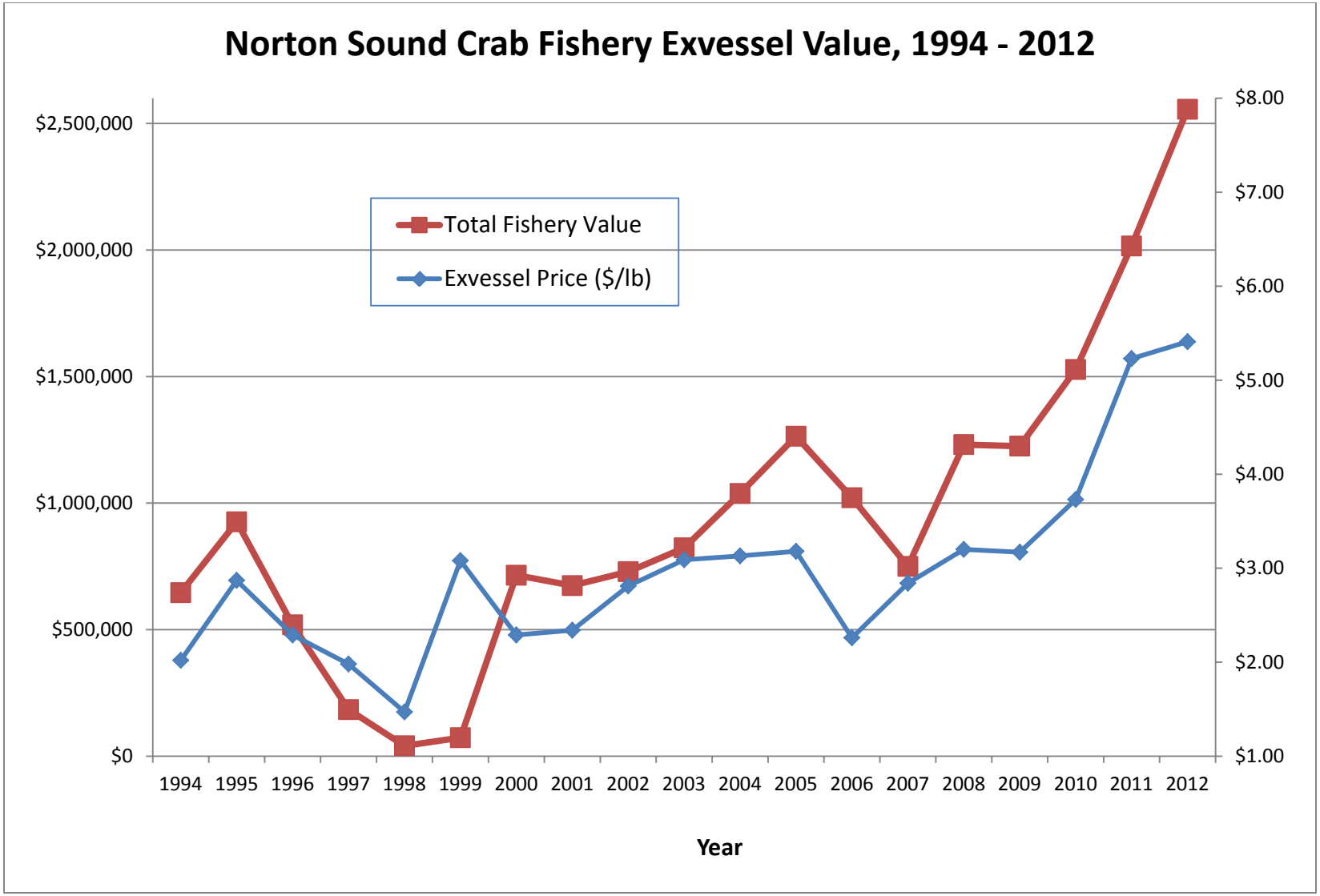
[c] No winter crab research study in 1992 or 1994.

[d] Includes prerecruit age 3.

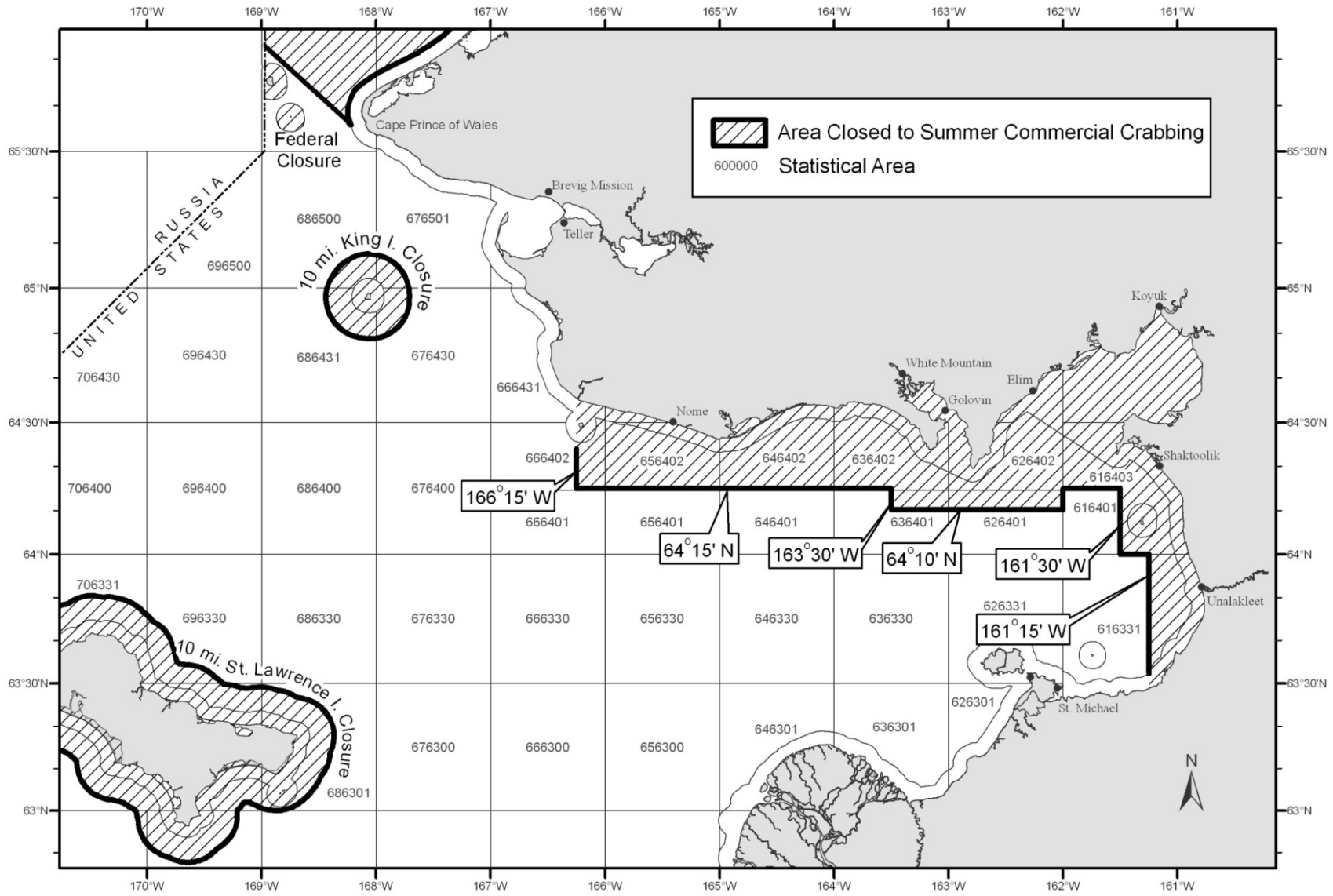


Note: CDQ catch is not included in years prior to 2009 because the open-access and CDQ portions of the crab fishery did not occur concurrently in those years.

Appendix E9.–Current and historical catch performance for the Norton Sound summer commercial crab fishery, 2006–2012.

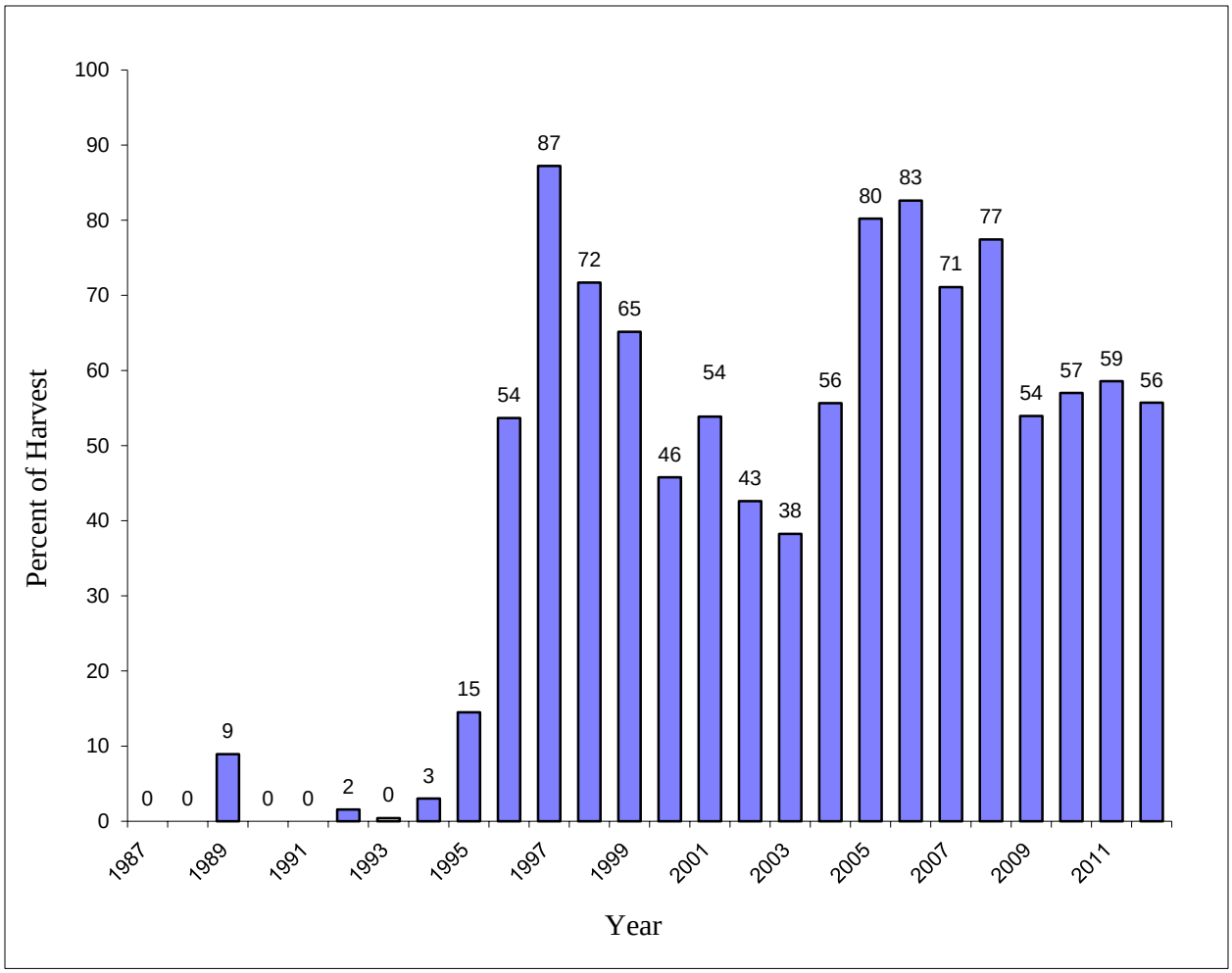


Appendix E10.–Norton Sound crab fishery exvessel value and price per pound, 1994–2012.

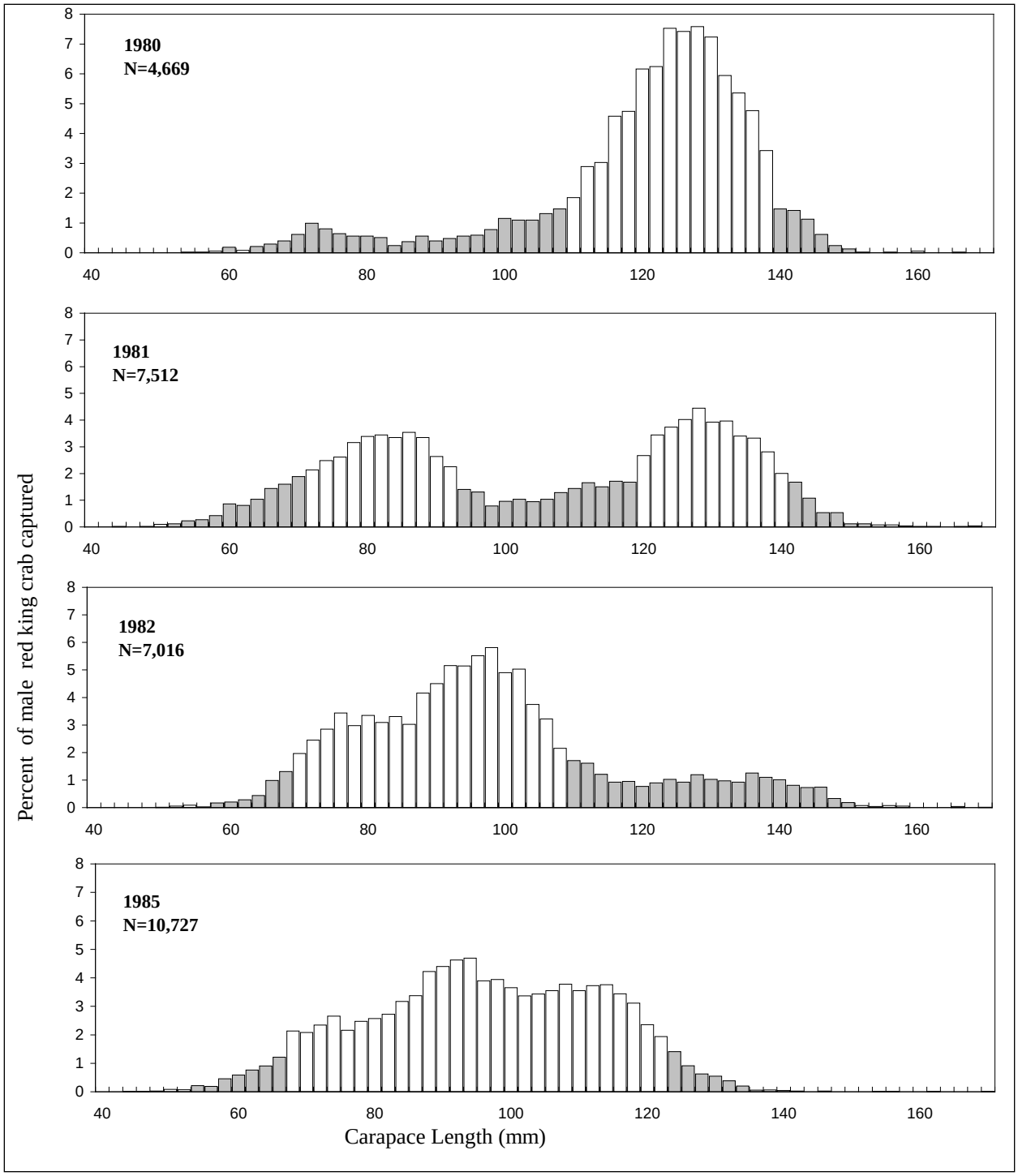


Note: Line drawn around the coastline delineates the 3-mile state waters zone.

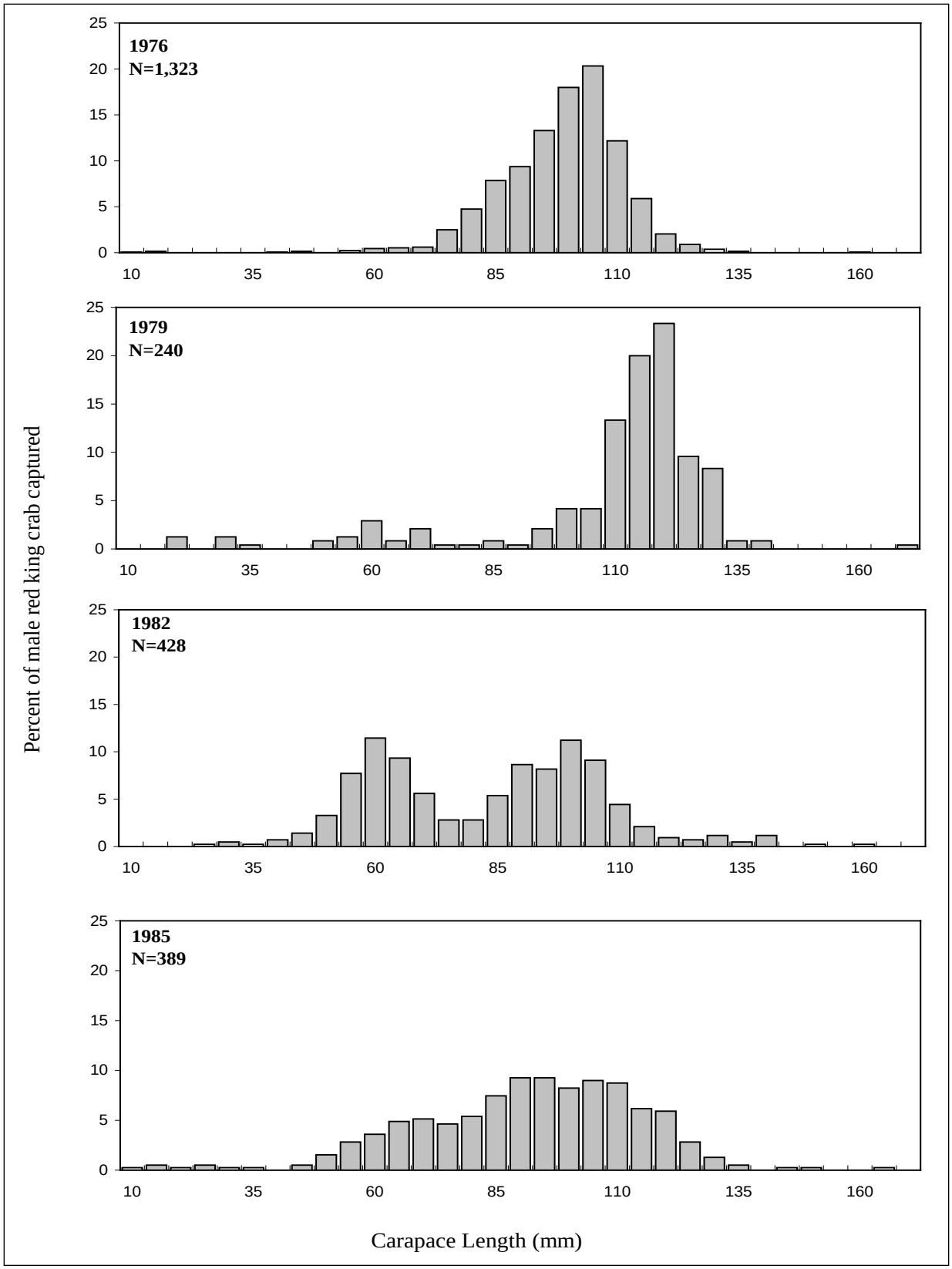
Appendix E11.–Closed water regulations in effect for the Norton Sound summer commercial crab fishery.



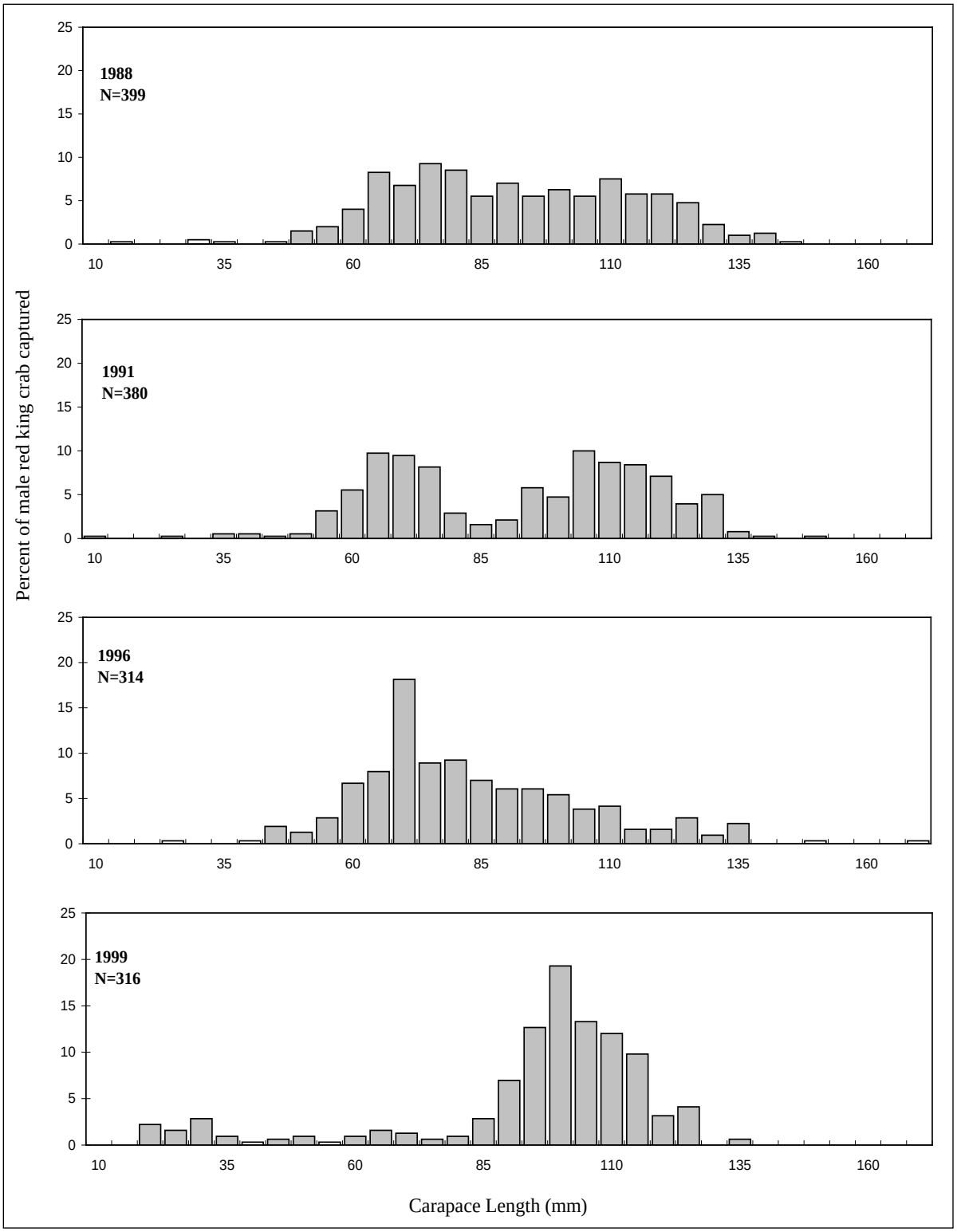
Appendix E12.–The percent of crab harvested during the Norton Sound summer commercial red king crab fishery east of 164º west longitude, 1987–2012.



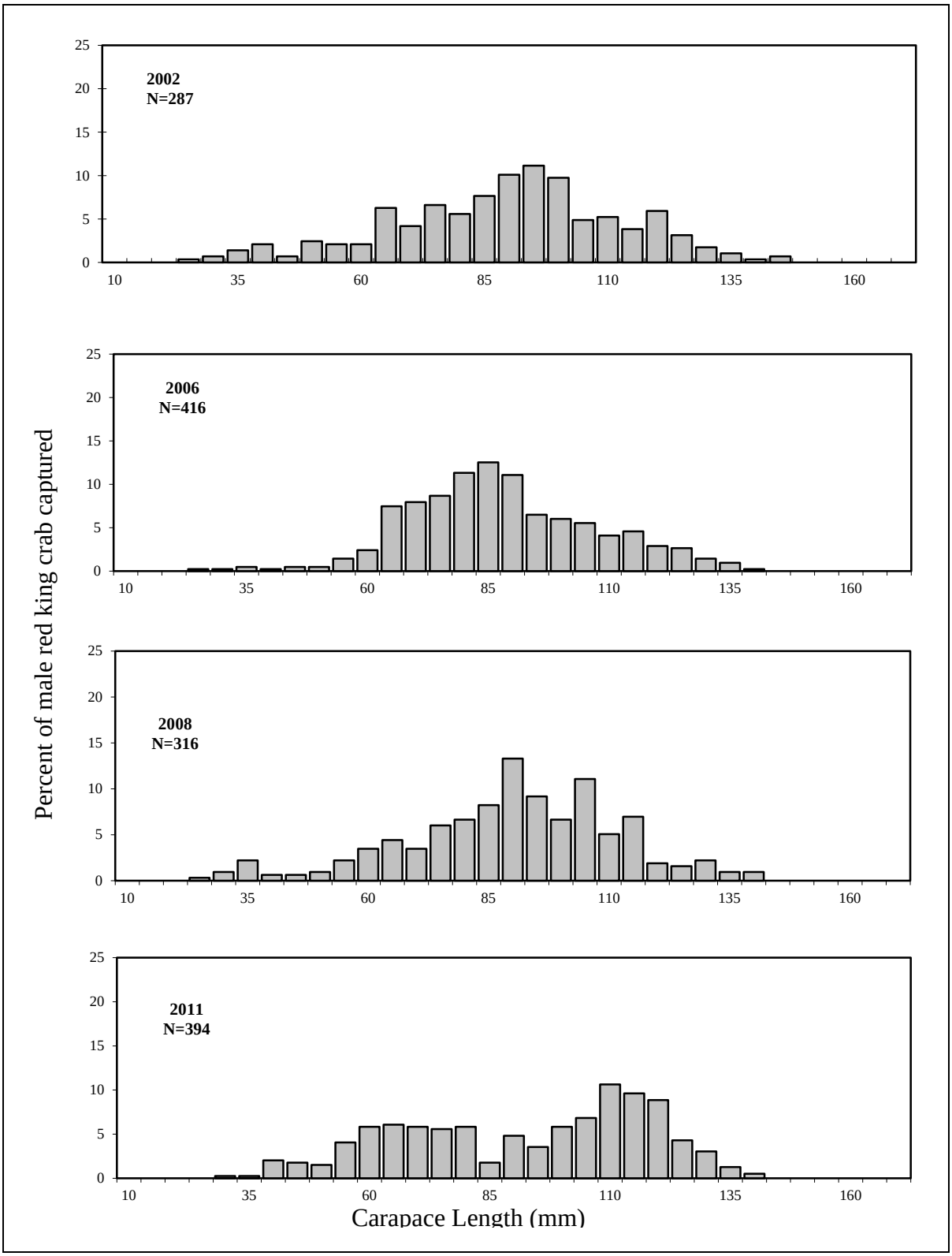
Appendix E13.–Norton Sound male red king crab size distribution from pot assessment surveys conducted by ADF&G in 1980, 1981, 1982, and 1985.



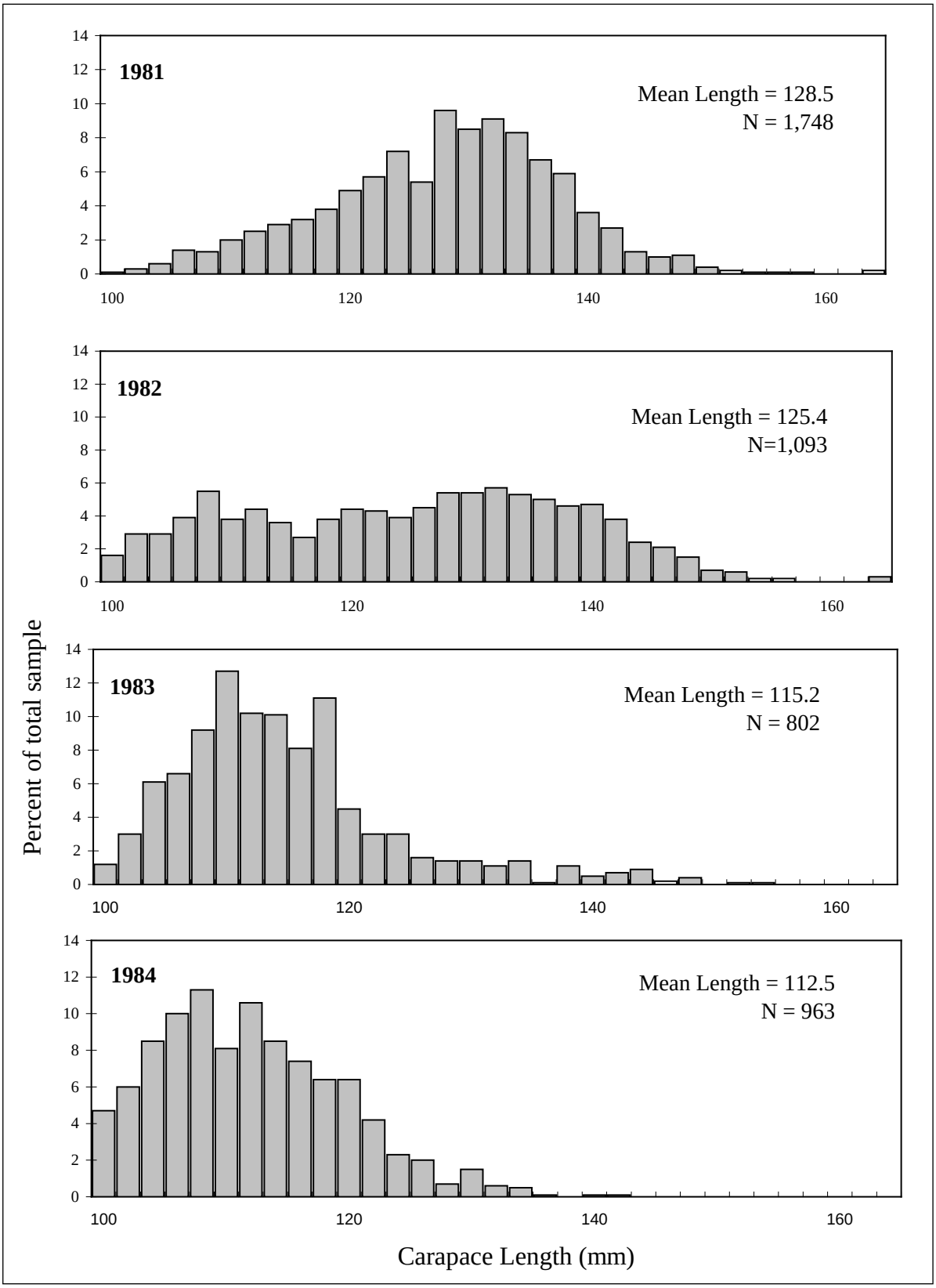
Appendix E14.–Norton Sound male red king crab size distribution from trawl assessment surveys conducted by the National Marine Fisheries Service, 1976, 1979, 1982, and 1985.



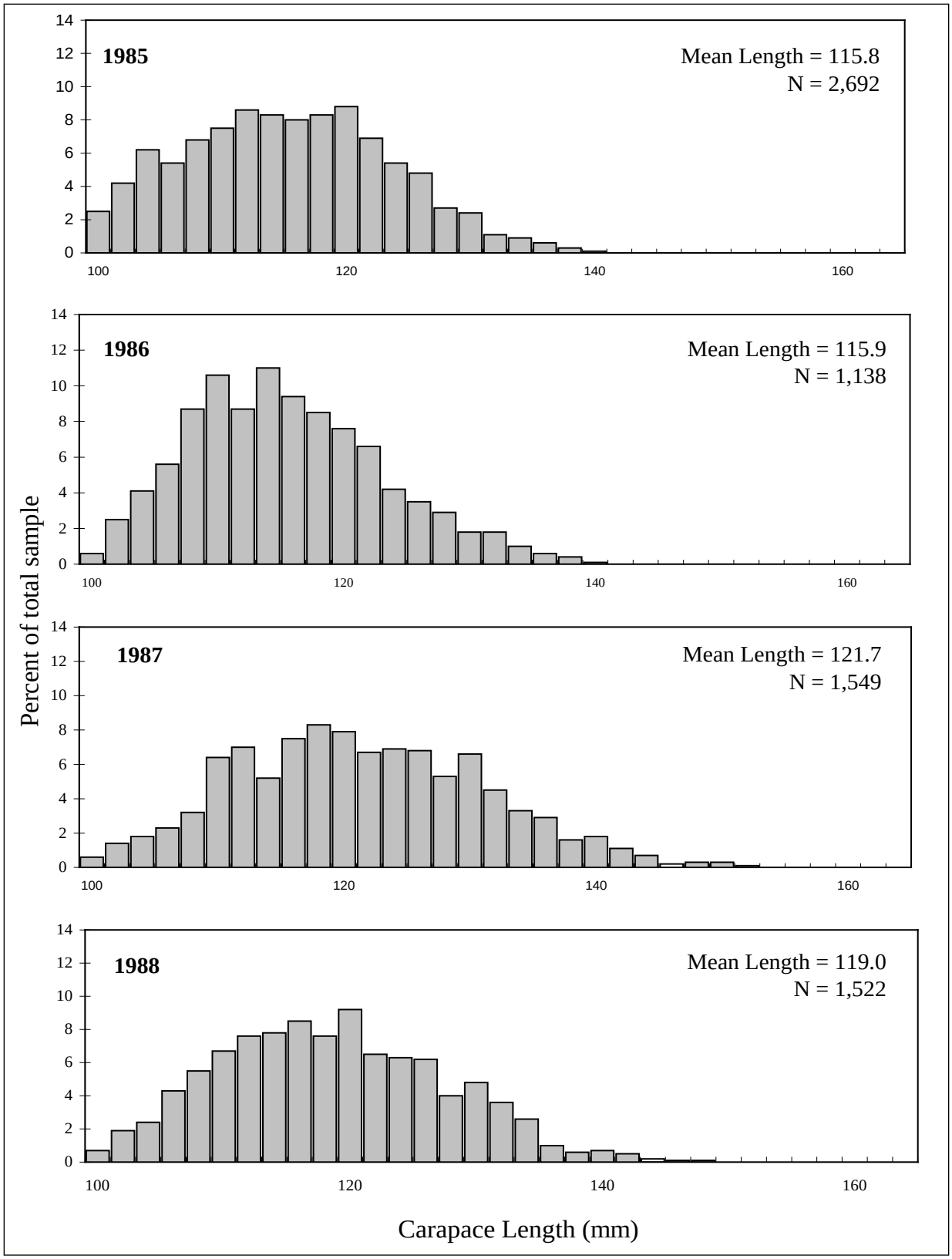
Appendix E15.–Norton Sound male red king crab size distribution from trawl assessment surveys conducted by the National Marine Fisheries Service in 1988 and 1991, and by ADF&G in 1996 and 1999.



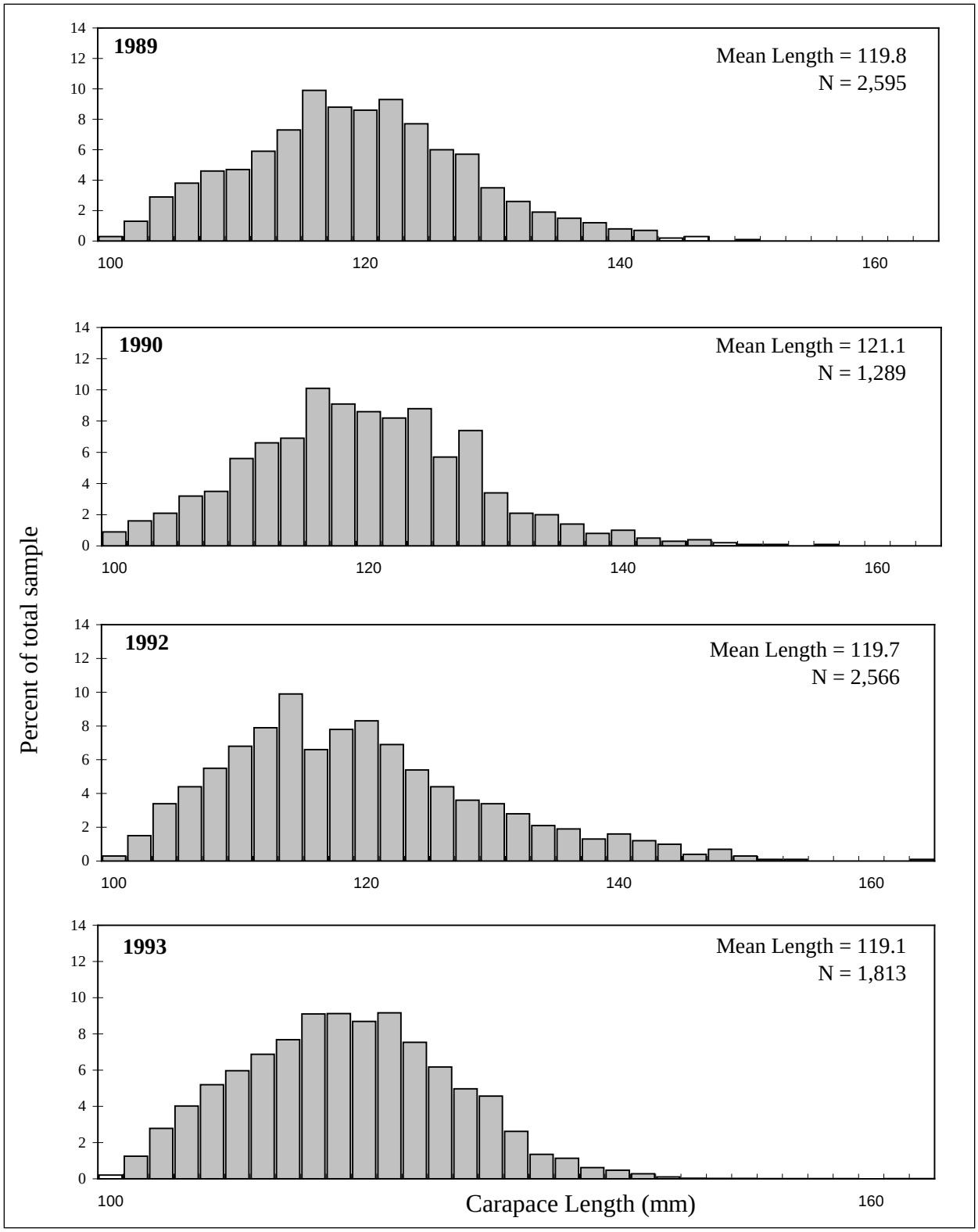
Appendix E16.–Norton Sound male red king crab size distribution from trawl assessment surveys conducted by ADF&G in 2002, 2006, 2008, and 2011.



Appendix E17.–Length composition of Norton Sound red king crab summer commercial harvests, 1981–1984.

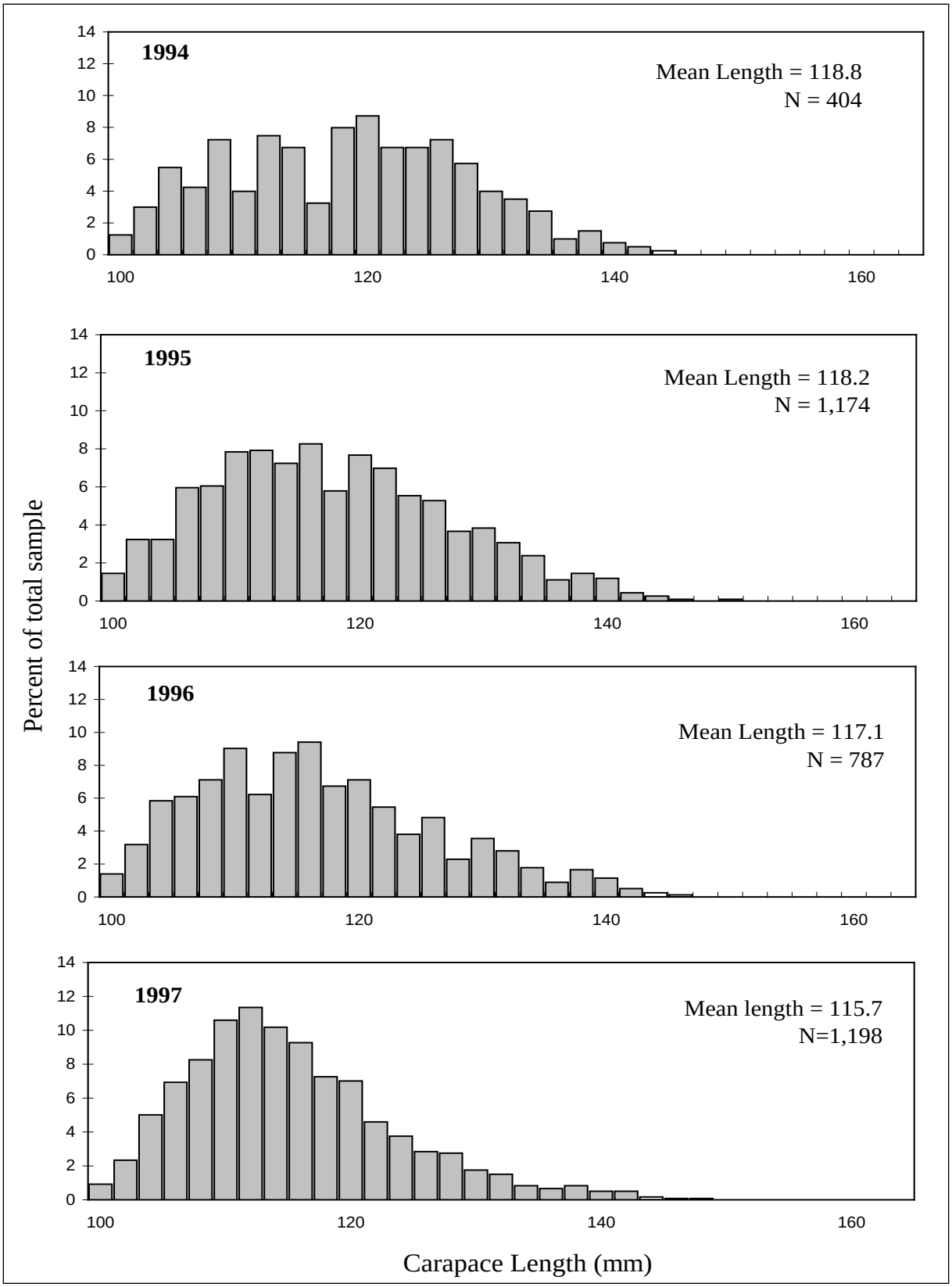


Appendix E18.–Length composition of Norton Sound red king crab summer commercial harvests, 1985–1988.

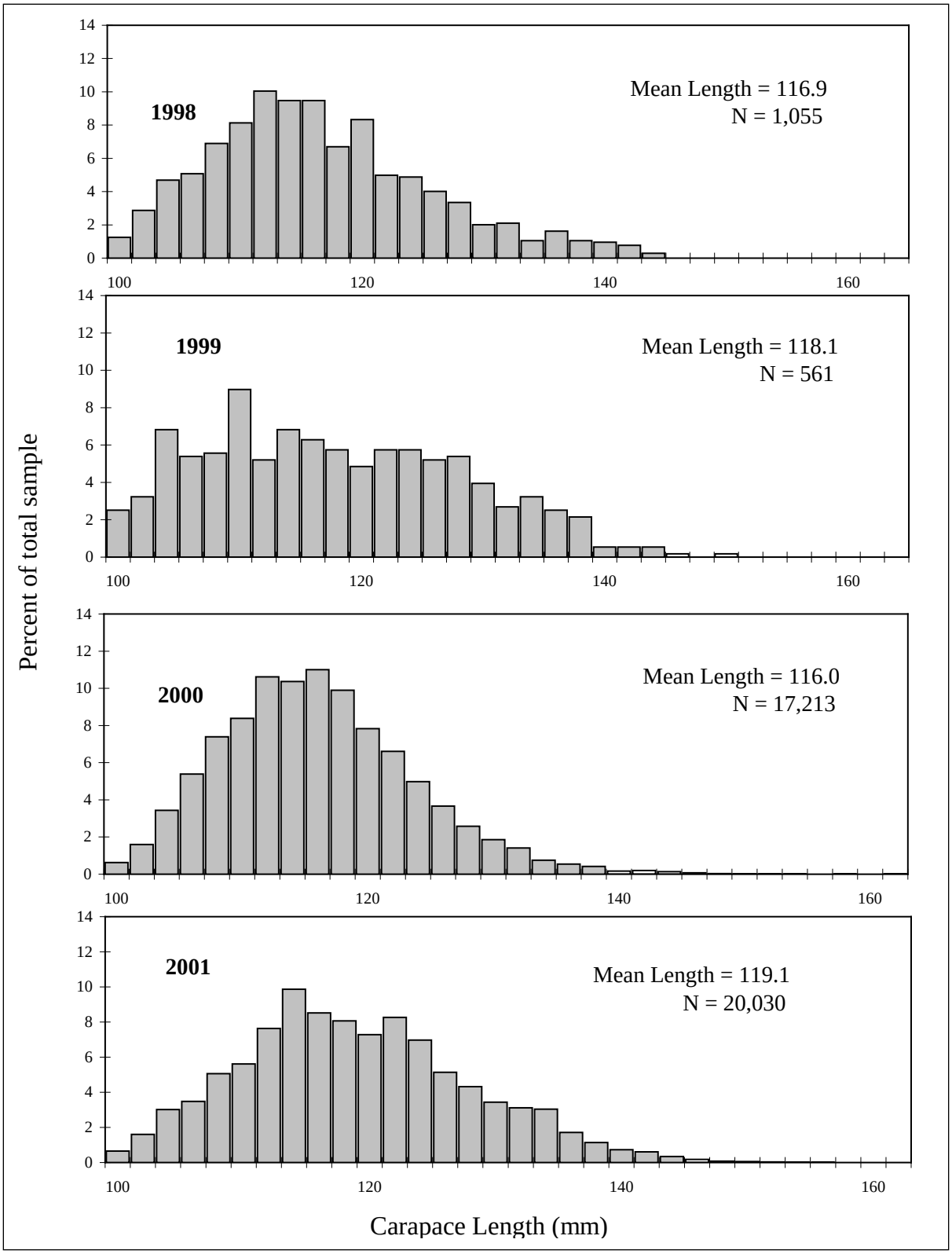


Note: No fishery in 1991.

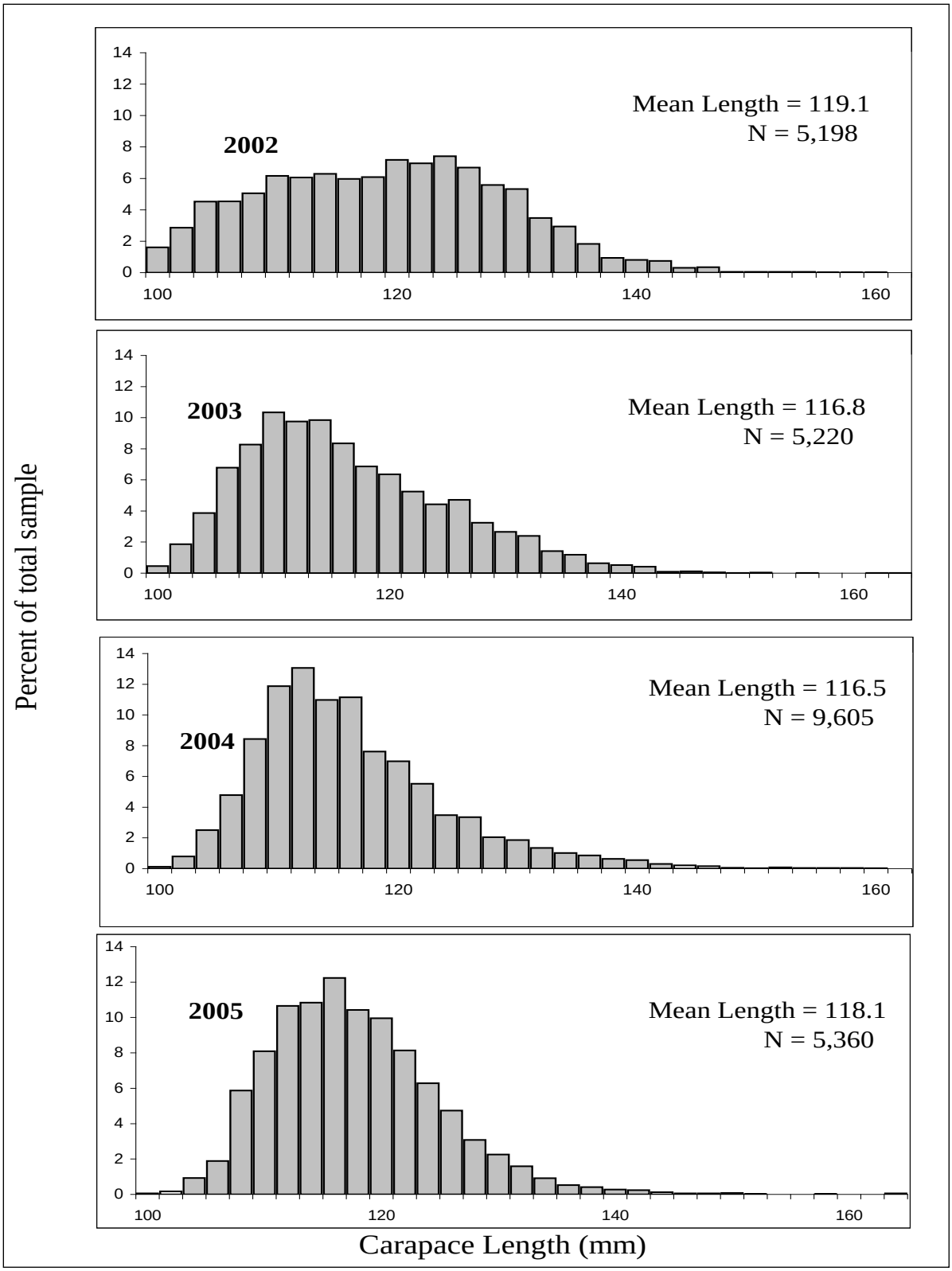
Appendix E19.–Length composition of Norton Sound red king crab summer commercial harvests, 1989–1993.



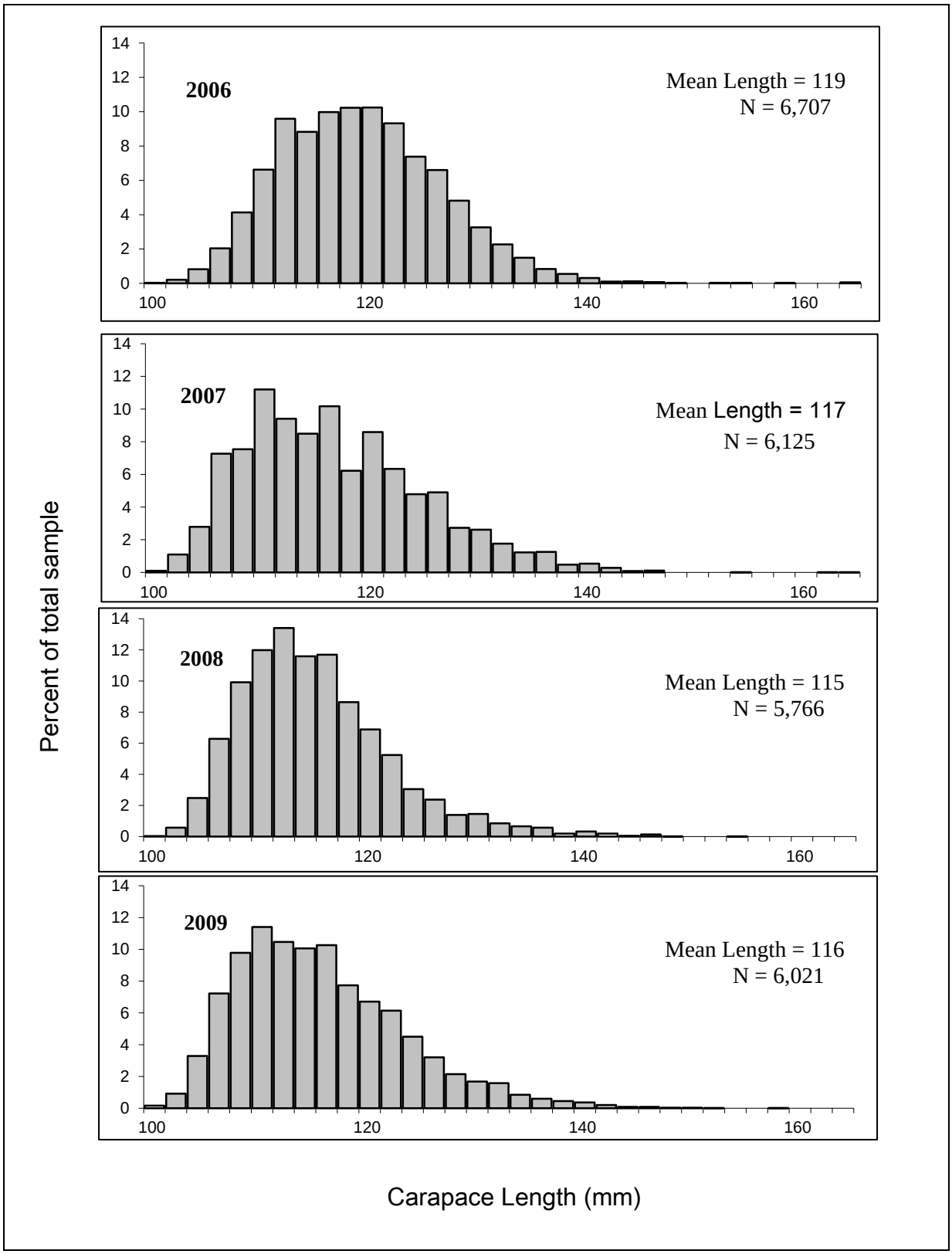
Appendix E20.–Length composition of Norton Sound red king crab summer commercial harvests, 1994–1997.



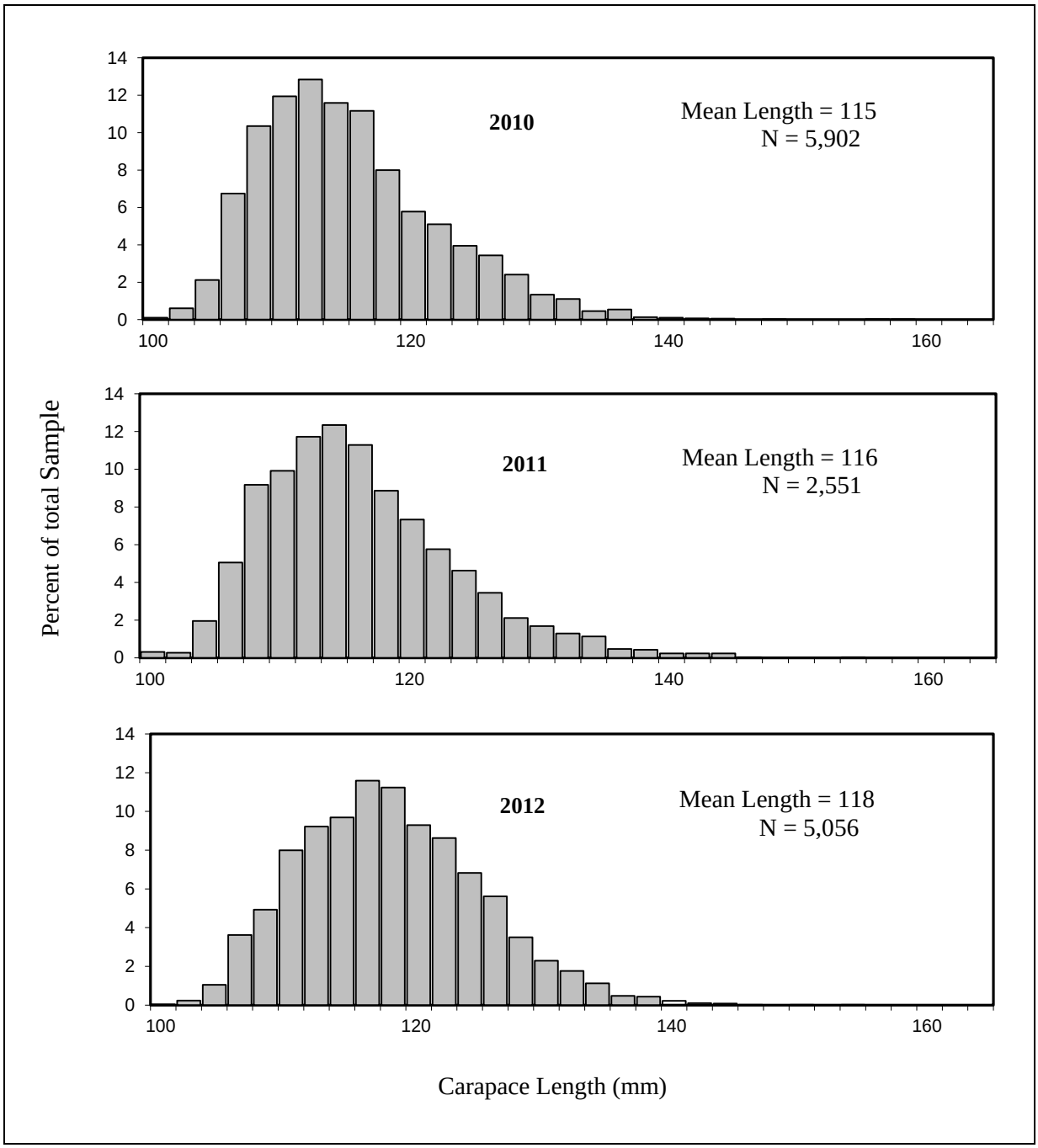
Appendix E21.–Length composition of Norton Sound red king crab summer commercial harvests, 1998–2001.



Appendix E22.–Length composition of Norton Sound red king crab summer commercial harvests, 2002–2005.



Appendix E23.–Length composition of Norton Sound red king crab summer commercial harvest, 2006–2009.



Appendix E24.–Length composition of Norton Sound red king crab summer commercial harvest, 2010–2012.

APPENDIX F: MISCELLANEOUS FISHERIES

Appendix F1.–Kotzebue District winter commercial sheefish harvest statistics, 1967–2012.

Year [b]	Number of Fishermen	Number of Fish	Pounds [a] Total	Pounds [a] Average	Price per Pound ($)	Estimated Value ($)
1967 [c]		4,000	26,000	6.5	0.20	5,200
1968	10	792	4,752	6.0	0.22	1,045
1969	17	2,340	15,209	6.5	0.25	3,802
1970 [c]		2,206			0.14	
1971	4	73	720	9.9	0.13	95
1972	5	456	4,071	8.9	0.16	651
1973	11	2,322	15,604	6.7	0.20	3,121
1974	6	1,080 [d]	6,265	5.8	0.30	1,880
1975 [c]		2,543 [d]	24,161	9.5	0.30	7,248
1976	14	2,633	19,484	7.4	0.30	5,845
1977	2	566	5,004	8.8	0.30	1,501
1978	11	2,879	26,200	9.1	0.40	10,480
1979 [e]						
1980	4	1,175	8,225	7.0	0.50	4,113
1981	1	278	1,836	6.6	0.75	1,377
1982	11	2,629 [f]	17,376	6.6	0.75	13,032
1983	8	1,424	13,395	9.4	0.50	6,698
1984	5	927 [d]	10,403	11.2	0.55	5,722
1985	4	342 [d]	3,902	11.4	0.51	1,990
1986	2	26	312	12.0	0.75	234
1987	3	670	5,414	8.1	0.49	2,653
1988	3	943	7,373	7.8	0.45	3,318
1989	8	2,335	16,749	7.2	0.51	8,542
1990 [c]	6	687	5,617	8.2		
1991	5	852	8,224	9.7	0.50	4,112
1992	3	289	2,850	9.9	0.65	1,853
1993	1	210 [d]	1,700	8.1	0.50	850
1994 [e]						
1995	1	226	2,240	9.9	0.50	1,120
1996	2	308	3,002	9.7	0.44	1,321
1997 [e]						
1998	1	254	2,400	9.4	0.43	1,032
1999 [e]						
2000 [e]						
2001	1	19	200	10.5	1.00	200
2002	4	30	300	10.0	1.00	300
2003	1	122	1,250	10.2	0.56	700
2004	1	37	474	12.8	1.91	905
2005 [g]	All Information Confidential					
2006-12 [e]						

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

[e] No reported commercial catches.

[f] Estimate based on historical average weight.

[g] 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, 1966–2004.

Year [a, b]	Number of Fishermen Interviewed	Reported Harvest	Average Catch per Fisherman
1966-1967	135	22,400	166
1967-1968	146	31,293	214
1968-1969	144	11,872	82
1970	168	13,928	83
1971	155	13,583	88
1972	79	3,832	49
1973	65	4,883	75
1974	58	1,062	18
1975	69	1,637	24
1976	57	966	17
1977	95	1,810	19
1978	95	1,810	19
1979	75	3,985	53
1980	74	3,117	42
1981	62	6,651	107
5/82-4/83 [c, d]	130	4,704	36
5/83-4/84 [c, d]	27	764	28
5/84-9/84 [c]	30	2,803	93
1985 [b, e]	2	60	30
1986 [b, c, e]	72	721	10
1987 [b, e]	46	276	6
1991	40	2,180	55
1992	43	2,821	66
1993	46	2,441	53
1994	171	3,181	19
1995 [f]	314	9,465	30
1996 [f]	389	6,953	18
1997 [f]	338	9,805	25
1998 [f]	435	5,350	14
1999 [f]	191	8,256	19
2000 [f]	237	7,446	17
2001 [f]	363	3,838	9
2002	101	3,882	38
2003	488	7,823 [g]	0
2004 [h]	440	10,163	23

Note: Subsistence surveys were not conducted from 1988 to 1990 and from 2004 to 2011. Data are not yet available from 2012.

[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] Villages were not surveyed for subsistence sheefish harvests from 1985 to 1990, and from 2004 to 2011.

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

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

[e] Catches were reported during the fall chum salmon subsistence surveys and may include summer as well as winter harvests.

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

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

[h] Subsistence surveys were not conducted in the town of Kotzebue.

Appendix F3.–Non-salmon sport fish harvests in Norton Sound and Kotzebue/Chukchi Sea, 1978–2012.

	Norton Sound		Kotzebue / Chukchi Sea		
Year	Dolly Varden	Arctic Grayling	Dolly Varden	Arctic Grayling	Inconnu/ Sheefish
1978	1,690		199		506
1979			1,772		709
1980	5,811		301		1,713
1981	3,981		1,177		1,263
1982	6,498		1,531		2,222
1983	9,779		2,192		2,079
1984	4,260		3,804		3,050
1985	5,695		1,557		1,645
1986	5,381		1,300		3,363
1987	5,506		1,072		1,836
1988	4,437	4,928	983		964
1989	7,003	4,205	999		629
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	3,063	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	3,600	1,185	1,406	445	957
2010	1,835	232	493	366	595
2011	4,041	1,398	865	486	385
2012	Sport fish harvests not yet available.				
Average					
2007-2011	3,121	819	1,308	485	613
2002-2011	3,395	928	1,281	891	891

Note: Data not available for all years.

Appendix F4.–Kotzebue District incidentally caught and sold Dolly Varden during the commercial salmon fishery, 1966–2012.

Year	Number of Fish Sold	Estimated Total Catch [a]	Pounds Sold	Average Weight [b]	Average Price
1966	3,325				0.55 [c]
1967	367		2,606	7.1	0.11
1968	3,181		21,949	6.9	0.14
1969	1,089 [d]				2.84 [c]
1970	2,095				
1971	3,828 [e]		23,353	6.1	0.16
1972	7,746		56,545	7.3	0.17
1973	640		4,608	7.2	0.16
1974	2,605 [f]		20,580	7.9	0.16
1975					
1976					
1977					
1978	1,229		9,094	7.4	0.15
1979	2,523		12,523	5.0	0.25
1980	3,049		17,015	5.6	0.20
1981	3 [g]		16	5.3	0.17
1982	3,447		23,648	6.9	0.20
1983	190 [g]	845	1,108	5.8	0.20
1984	347 [g]	1,090	2,104	6.1	0.25
1985	454	3,600	3,177	7.0	0.25
1986	5 [g]	2,373	34	6.8	0.20
1987	1,261	[h]	8,704	6.9	0.30
1988	752	[h]	4,967	6.6	0.35
1989	3,093	[h]	20,293	6.6	0.00
1990	604	[h]	4,219	7.0	0.25
1991	6,136	[h]	40,747	6.6	0.18
1992	1,977	[h]	11,951	6.0	0.10
1993	76	[h]	540	7.1	0.10
1994	149	[h]	767	5.1	0.17
1995	2,090	[h]	13,195	6.3	0.20
1996	188	[h]	1,153	6.1	0.25
1997	3,320	[h]	23,203	7.0	0.20
1998	349	[h]	2,640	7.6	0.20
1999	1,502	[h]	11,352	7.6	0.20
2000	7	[h]	44	6.3	0.20
2001	0	[h]	0	[i]	0.00
2002	0	30	0	[i]	0.00
2003	20	176	160	8.0	0.50
2004	124	[h]	846	6.8	0.26
2005	181	[h]	1,158	6.4	0.30

-continued-

Year	Number of Fish Sold	Estimated Total Catch [a]	Pounds Sold	Average Weight [b]	Average Price
2006	0	278	0	[i]	0.00
2007	0	960	0	[i]	0.00
2008	0	1,629	0	[i]	0.00
2009	0	960	0	[i]	0.00
2010	0	1,323	0	[i]	0.00
2011	0	400	0	[i]	0.00
2012	0	300	0	[i]	0.00

Note: Data not available for all years.

[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] Price per fish.

[d] Includes 269 taken by permit.

[e] Includes 179 taken by permit.

[f] Includes 234 taken during commercial sheefish fishery.

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

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

[i] Dolly Varden caught but not sold were not weighed.

Appendix F5.–Subsistence harvests of Dolly Varden from the villages of Kivalina and Noatak, 1959–2007.

	Kivalina		Noatak
Year	Number	Pounds	Number [a]
1959 [b]	34,240	85,600	
1960 [b]	49,720	124,300	
1962			27,623
1963			4,130
1968 [c]	49,512	120,214	
1969	64,970	152,750	32,350
1970	33,820	79,420	3,700
1971	29,281	68,518	5,320
1972	48,807	114,637	1,492
1973 [d]			
1979 [e]	14,600		9,060
1980			7,220
1981	15,000-18,000		3,056
1982	18,438	69,059	2,676 [d, f]
1983	16,270	68,467	4,545
1984	12,000 [e]		2,542
1985	10,500 [e]		
1986	7,436 [e]		46 [h]
1987 [g]			1,376 [h]
1991 [g]			4,814
1992 [g]			4,395
1993 [g]			4,275
1995 [g]			5,762
1996 [g]			5,031
1997 [g]			4,763
1998 [g]			3,872
2000 [g]			3,315
2001 [g]			2,702
2002 [g]			3,242
2003 [g]			6,386
2004 [g]			11,697
2007 [g]	20,527	67,739	10,234

Note: Subsistence surveys were not conducted in 1961, 1964-1967, 1974-1978, 1988-1990, 1994, 1999, 2005-2006, and after 2007. The Division of Subsistence did a comprehensive survey of Noatak fish harvests in 2012, but data are not yet available.

[a] No data available on poundage.

[b] From Wilimovsky and Wolfe 1966.

[c] Harvest data from Stephen Braund and Associates.

[d] Storm and ice conditions prevented fall harvest.

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

[f] Expanded estimates (see text on subsistence fishery in the 1982 annual management report, Schwarz et al. 1982).

[g] Based on ADF&G, Division of Subsistence, household surveys in Noatak.

[h] Subsistence fishermen just beginning to beach seine at the time of this survey.

Appendix F6.–Dolly Varden sport fish harvests in Norton Sound, by river, 1988–2012.

	Location									
Year	Marine Water	Nome	Pilgrim	Unalakleet	Fish-Niukluk	Sinuk	Snake	Solomon	Other Streams	Total
1988	418	2,001	327	891	0				1,218	4,855
1989	55	3,551	603	570	734				1,545	7,058
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	1,050	5,810
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	1,071	346	81	186	265	3,467
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	255	0	2,905	125	51	0	120	144	3,600
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	Sport fish harvests not yet available.									
Average										
2007-2011	3	218	2	1,666	604	84	103	125	315	3,121
2002-2011	25	456	58	1,465	466	189	63	85	544	3,350

Note: Data not available for all years.

Appendix F7.–Aerial survey counts of overwintering and spawning Dolly Varden in the Kotzebue District, 1968–1969, and 1976–2012.

Year [a]	Noatak River Spawner Survey [b]	Overwintering	
		Wulik River [c]	Kivalina River [c]
1968		90,236	27,640
1969		297,257	
1976		68,300	12,600
1977 [d]			
1978 [d]			
1979		55,030	15,744
1980		113,553	39,692
1981	7,922	101,826	45,355
1982	8,275	65,581	10,932
1983	2,924 [e]	[d]	[d]
1984	9,130	30,923	5,474
1985	10,979		
1986	[f]	5,590	5,030
1987	[f]	[f]	[f]
1988	[f]	80,000 [e]	[f]
1989	[f]	56,384	[f]
1990	7,261	[f]	[f]
1991	9,605	126,985	35,275
1992	[f]	135,135	[d]
1993	9,560	144,138	16,534
1994	[f]	66,752	[f]
1995	6,500	128,705	28,870
1996	12,184	61,005	[f]
1997	[f]	95,412	[f]
1998	[f]	104,043	[f]
1999	9,059 [g]	70,704	[f]
2000	[f]	[f]	[f]
2001	[f]	92,614	[f]
2002	[f]	44,257	[f]
2003	[f]	1,500 [h]	[f]
2004	[f]	101,806	[f]
2005	[f]	120,848	[f]
2006	[f]	108,352	[f]
2007	[f]	99,311	[f]
2008	[f]	71,493	[f]
2009	[f]	63,977	[f]
2010	[f]	36,866	[f]
2011	[f]	64,499	[f]
2012	[f]	21,084	[f]

Note: Data not available for all years.

[a] Counts are considered minimal as 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 since 1979.

[d] Poor weather hampered or prevented survey.

[e] Incomplete survey.

[f] Not surveyed.

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

[h] Spawning survey conducted very early (8/20/03).

Appendix F8.–Subsistence whitefish catch and effort in the Kotzebue District, 1970–1971, 1977–1993, and 1997–2004.

Year [a]	Number of Fishermen Interviewed	Number of Whitefish Harvested	Average Catch Per Fisherman
1970		58,165	
1971		36,012	
1977		30,810	
1978		77,474	
1979	123	43,653	355
1980	67	49,106	733
1981	71	37,746	532
1982 [b]			
1983	47	16,389	349
1984	79	28,614	362
1985 [c]	46	5,229	114
1986 [d]	72	11,854	165
1987 [d]	46	20,020	435
1988 [e]	38	14,000	368
1989 [b]			
1990 [b]			
1991 [d]	63	16,015	254
1992 [d]	66	17,485	265
1993 [d]	70	19,060	272
1997	413 [f]	84,851	205
1998	435 [f]	39,754	91
1999	191 [f]	56,326	295
2000	237 [f]	70,097	296
2001	363 [f]	30,976	85
2002	101 [g]	25,607	254
2003	446	73,242	164
2004	440 [f]	50,501	115

Note: Subsistence surveys were not conducted from 2004-2011. Data are not yet available from 2012 surveys.

[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] Data unavailable.

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

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

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

[f] Subsistence harvest information is from Ambler, Kiana, Kobuk, Noatak, Noorvik, and Shungnak.

[g] Subsistence harvest information is from Noatak and Noorvik.

APPENDIX G: OVERVIEW OF 2012

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

Appendix G2.–Alaska Department of Fish and Game and associated cooperative studies conducted within the Norton Sound, Port Clarence, Kotzebue and Arctic Districts, 2012.

HERRING

Herring Test Fishing

a) Location: Norton Sound ocean waters; field camp at Cape Denbigh, but fishing operation was limited due to ice.

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

Arctic District Salmon Baseline Sampling

a) Location: River systems near Wainwright.

b) Description: Sample local harvests of all salmon species for age, sex, length (ASL) and genetics. Aerial surveys are conducted to determine the presence of salmon in order to document for inclusion in anadromous waters catalog.

Kobuk River Test Fish

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

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

Unalakleet Nearshore Marine Test Fish

a) Location: Two sites 500 yards offshore: ~5.5 miles north of the village of Unalakleet and ~2.5 miles south of the village.

b) Description: To provide an index of Chinook salmon migrating through Unalakleet nearshore marine waters using test gillnets. Sample Chinook salmon found in test nets for age, sex and length at Unalakleet and maintain a record of sea surface temperature data. ADF&G project.

Unalakleet River Test Fish

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

b) Description: To maintain an index of migration up the Unalakleet River using test gillnets. Sample test fish and commercial catch for age, sex and length at Unalakleet. 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.

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.

-continued-

Niukluk River Tower

a) Location: Niukluk River, approximately one mile upstream from mouth.

b) Description: Determine daily and seasonal timing, magnitude, age, sex and length of salmon escapements. Collect age and sex data from beach seining. 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.

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.

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. Collect age and sex data through escapement sampling of weir trap. Weir is cooperative project operated by ADF&G with assistance from NSEDC. Video project is solely ADF&G.

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 or beach seining sampling. ADF&G project with additional funding from NSEDC.

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. Collect age, sex and length data from weir trap. Cooperative project operated by ADF&G and NSEDC.

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: To restore sockeye salmon population to higher historical levels, biological (age, weight, and length) samples taken from emigrating smolt and enumerated by mark and recapture. Hydroacoustic-tow net studies conducted to estimate rearing fry population and gather growth data. Fertilization of Salmon Lake. Cooperative project operated by NSEDC with assistance from ADF&G.

-continued-

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.

Subsistence Salmon Harvest 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 Division of Commercial Fisheries. Koyuk, Shaktoolik and Unalakleet were also surveyed by Division of Commercial Fisheries. ADF&G project.

CRAB

Nearshore Winter King Crab Study

a) Location: Ocean waters of Norton Sound, 1 to 1.5 miles south of Nome and 14 miles west to 48 miles east of Nome.

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

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 rate 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.

-end-

Appendix G3.–Commercial processors and buyers operating in Norton Sound and Kotzebue Sound, 2012.

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
Sun'aq Tribal Enterprises	Kodiak, AK	Buy and Fly Specialty/Smoked Salmon	Kotzebue Sound

Appendix G4.–Saint Michael subsistence salmon harvest survey form, 2012.

NORTON SOUND 2012 SUBSISTENCE SALMON HARVEST SURVEY

Community ID# 325

Alaska Department of Fish and Game

Household ID#_____

Community: SAINT MICHAEL

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 <u>usually</u> subsistence fish for salmon? ☐ YES ☐ NO

<u>FOR SALMON FISHING HOUSEHOLDS ONLY ("Yes" to #1)</u>

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.

	NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY GEAR TYPE)			**OF TOTAL HARVEST How many salmon were caught**	
SPECIES	**SUBSISTENCE GILL NET or SEINE** (Number of fish)	**ROD & REEL** (Number of fish)	**KEPT FROM Commercial Fishing** (Number of fish)	In the Pikmiktalik River (Number of fish)	In Marine W. adjacent to Pikmik. R. (Number of fish)
CHUM SALMON Dog					
CHINOOK SALMON King					
PINK SALMON Humpy					
SOCKEYE SALMON Red					
COHO SALMON Silver					

4. Comments or Suggestions?

Appendix G5.–Stebbins subsistence salmon harvest survey form, 2012.

NORTON SOUND 2012 SUBSISTENCE SALMON HARVEST SURVEY **Community ID# 327**

Alaska Department of Fish and Game- **Household ID#**_____

Community: STEBBINS

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 <u>usually</u> subsistence fish for salmon? ☐ YES ☐ NO

<u>FOR SALMON FISHING HOUSEHOLDS ONLY ("Yes" to #1)</u>

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.

	NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY GEAR TYPE)			OF TOTAL HARVEST How many salmon were caught	
SPECIES	**SUBSISTENCE GILL NET or SEINE** (Number of fish)	**ROD & REEL** (Number of fish)	**KEPT FROM Commercial Fishing** (Number of fish)	In the Pikmiktalik River (Number of fish)	In Marine W. adjacent to Pikmik. R. (Number of fish)
CHUM SALMON Dog					
CHINOOK SALMON King					
PINK SALMON Humpy					
SOCKEYE SALMON Red					
COHO SALMON Silver					

4. Comments or Suggestions?

Appendix G6.–Unalakleet Subdistrict subsistence salmon harvest survey form, 2012.

NORTON SOUND 2012 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 <u>usually</u> subsistence fish for salmon? ☐ YES ☐ NO

<u>FOR SALMON FISHING HOUSEHOLDS ONLY ("Yes" to #1)</u>

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)		NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY LOCATION)		
	SUBSISTENCE GILL NET or SEINE (Number of fish)	ROD & REEL (Number of fish)	MARINE WATERS	UNALAKLEET RIVER	NORTH RIVER
CHUM SALMON Dog					
CHINOOK SALMON King					
PINK SALMON Humpy					
SOCKEYE SALMON Red					
COHO SALMON Silver					

4. Comments or Suggestions?

Appendix G7.–Shaktoolik Subdistrict subsistence salmon harvest survey form, 2012.

NORTON SOUND 2012 SUBSISTENCE SALMON HARVEST SURVEY **Community ID# 307**

Alaska Department of Fish and Game- **Household ID#**_____

Community: SHAKTOOLIK

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 <u>usually</u> subsistence fish for salmon? ☐ YES ☐ NO

<u>FOR SALMON FISHING HOUSEHOLDS ONLY ("Yes" to #1)</u>

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)		NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY LOCATION)	
	SUBSISTENCE GILL NET or SEINE (Number of fish)	ROD & REEL (Number of fish)	MARINE WATERS	SHAKTOOLIK RIVER
CHUM SALMON Dog				
CHINOOK SALMON King				
PINK SALMON Humpy				
SOCKEYE SALMON Red				
COHO SALMON Silver				

4. Comments or Suggestions?

Appendix G8.–Norton Bay Subdistrict subsistence salmon harvest survey form, 2012.

NORTON SOUND 2012 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) ☐ YES ☐ NO

2. Does your household <u>usually</u> subsistence fish for salmon? ☐ YES ☐ NO

<u>FOR SALMON FISHING HOUSEHOLDS ONLY ("Yes" to #1)</u>

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)		NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY LOCATION)			
	SUBSISTENCE GILL NET or SEINE (Number of fish)	ROD & REEL (Number of fish)	MARINE WATERS	KOYUK RIVER	INGLUTALIK RIVER	UNGALIK RIVER
CHUM Dog						
CHINOOK King						
PINK Humpy						
SOCKEYE Red						
COHO Silver						

4. Comments or Suggestions?

RED KING CRAB

Emergency Order: 3-C-Z-01-12 Effective Date: June 29, 2012

EXPLANATION: This emergency order opens both the CDQ fishery and the commercial open access crab fishery in Norton Sound from 12:00 noon Friday, June 29 until 12:00 noon Monday, September 3, 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 2012 Norton Sound open access fishery is 430,540 pounds. By regulation the CDQ crab fishery can open anytime the CDQ group is ready to harvest the crab. CDQ crab can only be harvested by permit holders approved by NSEDC and the quota is 34,910 pounds. The CDQ group has notified the department they are ready to harvest crab.

Emergency Order: 3-C-Z-02-12 Effective Date: August 11, 2012

EXPLANATION: This emergency order closes the commercial open access crab fishery in Norton Sound. Permit holders (excluding crabbers registered for the CDQ fishery) must have pots unbaited and secured open by 6:00 p.m., Saturday, August 11 and removed from the water by Friday, August 17, 2012.

JUSTIFICATION: The guideline harvest level for the 2012 Norton Sound open access crab fishery is 430,540 pounds. Through the morning of August 10, there were ~402,000 pounds reported harvested. There are currently at least 28 vessels still fishing and the quota is expected to be reached by 6:00 p.m., Saturday, August 11. All open access crab must be delivered by 6:00 p.m., Sunday, August 12. All commercial crab pots that will not be used during the CDQ fishery must be removed from the water by Friday, August 17, 2012.

Emergency Order: 3-C-Z-03-12 Effective Date: September 3, 2012

EXPLANATION: This emergency order extends the CDQ crab fishery season in Norton Sound from 12:00 noon Monday, September 3, until 12:00 noon Thursday, September 13, or when the CDQ quota is reached.

JUSTIFICATION: The CDQ crab quota for Norton Sound Economic Development Corporation is 34,910 pounds. So far, a little over 9,000 pounds remain on the quota. Weather and high surf conditions are preventing crab vessels from recovering crab by the original closure time of noon, September 3; therefore, the season is extended for 10 days to allow for safer conditions for crab boats to go out. All crab must be delivered by 12 noon, Friday, September 14. All commercial crab pots must be removed from the water by Friday, September 21, 2012.

HERRING

Emergency Order: 3-H-Z-1-12 Effective Date: June 15, 2012

EXPLANATION: This emergency order opens the Norton Sound District to commercial gillnet fishing for bait herring beginning 5 p.m. Friday, June 15, 2012 until Sunday, July 1, 2012, unless superseded by another emergency order.

JUSTIFICATION: An exceptionally large amount of ice remains in southern Norton Sound. The department test fish crew departed from Cape Denbigh yesterday to prevent being marooned due to the approaching ice. However, northern Norton Sound is ice free and Norton Sound Seafood Products in Nome is interested in purchasing approximately 60 tons of bait herring. Leaving the fishery open continuously through Saturday June 30 will provide the buyer with flexibility to efficiently harvest this small amount of bait herring. Any permit holders interested in harvesting bait herring and selling to the Nome plant must register with Norton Sound Seafoods in Nome. To the south, the Unalakleet-based sea food plant is not ready to process bait herring due to shorefast ice. Once permit holders in southern Norton Sound are able to fish herring, they must make sure they have a market for the bait

-continued-

herring. Herring fishermen can use their commercial herring sac roe permit card or their commercial herring bait permit card for this fishery. Any herring not purchased by the buyer must be retained for personal or subsistence uses.

KOTZEBUE SALMON

Emergency Order: 3-S-X-01-12 Effective Date: July 10, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 9 p.m. Tuesday, July 10 until 5 a.m. Wednesday, 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-02-12 Effective Date: July 11, 2012

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 Wednesday, July 11 until 1 p.m. Saturday, July 21.

JUSTIFICATION: There is a small market buyer interested in buying salmon from two to three permit holders. Compared to the normal fishing effort of over 50 permit holders during some periods during this time last year the small effort should not jeopardize making escapement goals or providing subsistence opportunity.

Emergency Order: 3-S-X-03-12 Effective Date: July 11, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours daily from the hours of 8 p.m. until 4 a.m. beginning Wednesday, July 11 and ending at 4 a.m. Saturday, July 14.

JUSTIFICATION: Catch during the first 8 hour opening was 1,580 chum salmon by 7 permit holders. The catch was average compared to previous years for this date. The buyer has notified the department that they would like to purchase fish from 8 p.m. to 4 a.m. for the next several days. The low effort during the first week of commercial fishing provides an opportunity for the department to gauge early season run strength without jeopardizing making escapement goals or limiting subsistence opportunity.

Emergency Order: 3-S-X-04-12 Effective Date: July 17, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours daily from the hours of 8 p.m. until 4 a.m. beginning Tuesday, July 17 and ending at 4 a.m. Saturday, July 21.

JUSTIFICATION: Catch during the first week of commercial fishing was nearly 15,000 chum salmon and was the best catch for opening week since 1995. There has been three days elapsed since the last commercial fishing opening because of airport construction preventing the buyer to fly salmon out to market. This three day window of no commercial fishing should provide sufficient early escapement up river and allow for good subsistence fishing. Having eight hour commercial fishing periods daily with a weekend closure should not jeopardize making escapement goals or limiting subsistence opportunity.

Emergency Order: 3-S-X-05-12 Effective Date: July 22, 2012

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

JUSTIFICATION: Catches during the second week of commercial fishing were average compared to previous

-continued-

years. Total harvest to date is 38,500 chum salmon. The Kobuk River test fish project at Kiana is now operational and catches have been average for the first week.

Emergency Order: 3-S-X-06-12 Effective Date: July 23, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 8 a.m. to 2 p.m. daily beginning on Monday, July 23 until 2 p.m. Saturday, July 28.

JUSTIFICATION: There is a small market buyer interested in buying salmon from two to three permit holders. Compared to the 49 permit holders fishing during the first two weeks of the fishery when the major seafood company is buying during an evening fishery the small effort should not jeopardize making escapement goals or providing subsistence opportunity.

Emergency Order: 3-S-X-07-12 Effective Date: July 23, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Monday, July 23 until 2 a.m. Tuesday, July 24.

JUSTIFICATION: Catches during last night's eight hour period were 10,538 chum salmon for 37 permit holders. Total harvest to date is nearly 50,000 chum salmon and catch has been average. The Kobuk River test fish project catches have been average for the first week. Continuing with short duration commercial fishing periods should not jeopardize escapement and should still provide for subsistence fishing opportunity.

Emergency Order: 3-S-X-08-12 Effective Date: July 24, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Tuesday, July 24 until 2 a.m. Wednesday, July 25.

JUSTIFICATION: Catch during last night's eight hour period wase 6,850 chum salmon for 42 permit holders. Total harvest to date is nearly 56,000 chum salmon and catch has been average. Continuing with short duration commercial fishing periods should not jeopardize escapement and should still provide for subsistence fishing opportunity.

Emergency Order: 3-S-X-09-12 Effective Date: July 25, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Wednesday, July 25 until 2 a.m. Thursday, July 26.

JUSTIFICATION: Catch during last night's eight hour period was 4,666 chum salmon for 26 permit holders. Weather affected last night's fishing effort and catch was lower than previous periods this week. Cumulative catch is over 60,000 chum salmon and the catch has been average. Continuing with short duration commercial fishing periods should not jeopardize escapement and should still provide for subsistence fishing opportunity.

Emergency Order: 3-S-X-10-12 Effective Date: July 26, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Thursday, July 26 until 2 a.m. Friday, July 27.

JUSTIFICATION: Catch during last night's eight hour period was 2,160 chum salmon for 19 permit holders. Weather again affected last night's fishing effort with the lowest participation since the first two opening periods the second week of July. The Kobuk River test fish catch continues to be average indicating sufficient escapement into the Kobuk River drainage. Continuing with short duration commercial fishing periods should not jeopardize escapement and should still provide for subsistence fishing opportunity.

-continued-

Emergency Order: 3-S-X-11-12 Effective Date: July 27, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for 8 hours from the hours of 6 p.m. Friday, July 27 until 2 a.m. Saturday, July 28.

JUSTIFICATION: Catch during last night's eight hour period was 8,160 chum salmon for 35 permit holders. The catch was average for this date. The Kobuk River test fish catch continues to be average with the cumulative chum salmon catch to date ranking 7th highest out of 20 years. Continuing with short duration commercial fishing periods should not jeopardize escapement and should still provide for subsistence fishing opportunity.

Emergency Order: 3-S-X-12-12 Effective Date: July 31, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for two 8 hour fishing periods from the hours of 4 p.m. Tuesday, July 31 until 12 a.m. Wednesday, August 1 and from 4 p.m. Wednesday, August 1 until 12 a.m. Thursday, August 2.

JUSTIFICATION: Catch this season has been 77,000 chum salmon by 59 permit holders. The catch has been average. The Kobuk River test fish catch at Kiana has increased in recent days and the cumulative chum salmon catch ranks 6th highest out of 20 years. Continuing with short duration commercial fishing periods should not jeopardize escapement and should still provide for subsistence fishing opportunity.

Emergency Order: 3-S-X-13-12 Effective Date: August 1, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District from the hours of 7 a.m. to 12 p.m. daily beginning on Wednesday, August 1 until 12 p.m. Saturday, August 4.

JUSTIFICATION: There is a small market buyer interested in buying salmon from two to three permit holders. Compared to the 59 permit holders fishing during the first three weeks of the fishery when the major seafood company is buying during an evening fishery the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-14-12 Effective Date: August 2, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 8 hour fishing period from the hours of 4 p.m. Thursday, August 2 until 12 a.m. Friday, August 3.

JUSTIFICATION: Catch this season has been 100,000 chum salmon by 59 permit holders. The catch has been average. The Kobuk River test fish catch is in the top half of catches for the 20 year project. Continuing with short duration commercial fishing periods should not jeopardize escapement and should still provide for subsistence fishing opportunity.

Emergency Order: 3-S-X-15-12 Effective Date: August 5, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for two 6 hour fishing periods from the hours of 8 a.m. Sunday, August 5 until 2 p.m. Sunday, August 5 and from 8 a.m. Monday, August 6 until 2 p.m. Monday, August 6.

JUSTIFICATION: There is a small market buyer interested in buying salmon from two to three permit holders. Compared to the 62 permit holders fishing during the first four weeks of the fishery when the major seafood company is buying during an evening fishery the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-16-12 Effective Date: August 5, 2012

-continued-

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 4 hour fishing period from the hours of 6 p.m. Sunday, August 5 until 10 p.m. Sunday, August 5.

JUSTIFICATION: Catch this season has been 132,000 chum salmon by 62 permit holders. There was a record catch for an 8-hour fishing period on Thursday evening with 32,689 chum salmon caught by 54 permit holders. The Kobuk River test fish catch is in the top half of catches for the 20 year project and catches have increased the last two days. Continuing with short duration commercial fishing periods should not jeopardize escapement and should still provide for subsistence fishing opportunity.

Emergency Order: 3-S-X-17-12 Effective Date: August 6, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 4 hour fishing period from the hours of 6 p.m. Monday, August 6 until 10 p.m. Monday, August 6.

JUSTIFICATION: During last night's 4 hour fishing period 31 permit holders caught 8,389 chum salmon. Catches, although below average for this fishing period, were likely affected by weather that also limited the number of permit holders fishing. Chum salmon catches at the department test fish project on the Kobuk River at Kiana have skyrocketed the last few days with yesterday's catch being the 10th best in the 20-year project history. Cumulative catches at the test fish project rank 7th highest and the cumulative ranking is expected to move higher in the next several days. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-18-12 Effective Date: August 7, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District daily for 6 hour fishing periods from the hours of 7 a.m. to 1 p.m. from Tuesday, August 7 until 1 p.m. Monday, August 13.

JUSTIFICATION: There is a small market buyer interested in buying salmon from two to three permit holders. Compared to the 62 permit holders fishing during the first four weeks of the fishery when the major seafood company is buying during an evening fishery the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-19-12 Effective Date: August 7, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 3 hour fishing period from the hours of 6 p.m. Tuesday, August 7 until 9 p.m. Tuesday, August 7.

JUSTIFICATION: During last night's 4 hour fishing period 51 permit holders caught 10,537 chum salmon. The buyer told permit holders at 7:30 p.m., 1 ½ hours into the period, to stop fishing, but some continued to fish all 4 hours. Catches were likely above average, but without accurate numbers as to how long each permit holder fished the catch rate is difficult to assess. Chum salmon catches at the department test fish project on the Kobuk River at Kiana continue to skyrocket with yesterday's catch setting a new daily catch index record. Cumulative catches at the test fish project rank 5th highest in the 20-year project history and the cumulative ranking is expected to move higher in the next few days.

Emergency Order: 3-S-X-20-12 Effective Date: August 8, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 3 hour fishing period from the hours of 6 p.m. Wednesday, August 8 until 9 p.m. Wednesday, August 8.

JUSTIFICATION: During last night's 3 hour fishing period 29 permit holders caught 7,556 chum salmon. Catches were average. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

-continued-

Emergency Order: 3-S-X-21-12 Effective Date: August 8, 2012

EXPLANATION: This emergency order extends the 3-hour commercial salmon fishing in the Kotzebue District by one hour until 10 p.m. Commercial salmon fishing is now open in the Kotzebue District from 6 p.m. Wednesday, August 8 until 10 p.m. Wednesday, August 8.

JUSTIFICATION: The buyer has requested a one-hour extension to the previously announced 3 hour fishing period because of additional cargo space available on airlines.

Emergency Order: 3-S-X-22-12 Effective Date: August 10, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 3 hour fishing period from the hours of 6 p.m. Friday, August 10 until 9 p.m. Friday, August 10.

JUSTIFICATION: During Wednesday night's 4 hour fishing period 53 permit holders caught 15,495 chum salmon. Catches were above average. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-23-12 Effective Date: August 12, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 3 hour fishing period from the hours of 6 p.m. Sunday, August 12 until 9 p.m. Sunday, August 12.

JUSTIFICATION: Conitnuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-24-12 Effective Date: August 13, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 3 hour fishing period from the hours of 6 p.m. Monday, August 13 until 9 p.m. Monday, August 13.

JUSTIFICATION: During last night's 3 hour fishing period 41 permit holders caught 7,124 chum salmon. Catches were average. The Kobuk River test fish index ranks 3rd best in the 20-year project history. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-25-12 Effective Date: August 14, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District daily for 6 hour fishing periods from the hours of 7 a.m. to 1 p.m. from Tuesday, August 14 until 1 p.m. Monday, August 20.

JUSTIFICATION: There is a small market buyer interested in buying salmon from two to three permit holders. Compared to over 70 permit holders fishing this season when the major seafood company is buying during an evening fishery the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-26-12 Effective Date: August 14, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 3 hour fishing period from the hours of 6 p.m. Tuesday, August 14 until 9 p.m. Tuesday, August 14.

JUSTIFICATION: During last night's 3 hour fishing period 45 permit holders caught 8,082 chum salmon. Catches were average. The Kobuk River test fish index ranks 3rd best in the 20-year project history. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-27-12 Effective Date: August 15, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 3 hour

-continued-

fishing period from the hours of 6 p.m. Wednesday, August 15 until 9 p.m. Wednesday, August 15.

JUSTIFICATION: During last night's 3 hour fishing period 42 permit holders caught 10,816 chum salmon. Catches were average. The Kobuk River test fish index ranks 3rd best in the 20-year project history. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-28-12 Effective Date: August 16, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 3 hour fishing period from the hours of 6 p.m. Thursday, August 16 until 9 p.m. Thursday, August 16.

JUSTIFICATION: During last night's 3 hour fishing period 8 permit holders caught 1,083 chum salmon. Catches and fishing effort were well below average because of weather. The Kobuk River test fish index ranks 3rd best in the 20-year project history. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-29-12 Effective Date: August 17, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 3 hour fishing period from the hours of 6 p.m. Friday, August 17 until 9 p.m. Friday, August 17.

JUSTIFICATION: During last night's 3 hour fishing period 17 permit holders caught 2,051 chum salmon. Catches and fishing effort were well below average because of weather. The Kobuk River test fish index ranks 3rd best in the 20-year project history. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-30-12 Effective Date: August 19, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 4 hour fishing period from the hours of 5 p.m. Sunday, August 19 until 9 p.m. Sunday, August 19.

JUSTIFICATION: During Friday night's 3 hour fishing period 22 permit holders caught 2,147 chum salmon. Catches and fishing effort were well below average because of weather. The Kobuk River test fish project has completed operations and the test fish index ranks 3rd best in the 20-year project history. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-31-12 Effective Date: August 20, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 6 hour fishing period from the hours of 3 p.m. Monday, August 20 until 9 p.m. Monday, August 20.

JUSTIFICATION: During last night's 4 hour fishing period 11 permit holders caught 703 chum salmon. Catches and fishing effort were well below average because of weather. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-32-12 Effective Date: August 21, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for two 5-hour fishing periods from the hours of 7 a.m. to 12 p.m. on Tuesday, August 21 and Wednesday, August 22.

JUSTIFICATION: There is a small market buyer interested in buying salmon from two to three permit holders. Compared to over 70 permit holders fishing this season when the major seafood company is buying during an evening fishery the small effort should not jeopardize making escapement goals or subsistence opportunity.

-continued-

Emergency Order: 3-S-X-33-12 Effective Date: August 21, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 6 hour fishing period from the hours of 3 p.m. Tuesday, August 21 until 9 p.m. Tuesday, August 21.

JUSTIFICATION: During last night's 6 hour fishing period 26 permit holders caught 2,456 chum salmon. Catches and fishing effort were well below average because of weather. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-34-12 Effective Date: August 22, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for three 6 hour fishing periods from the hours of 3 p.m. to 9 p.m. daily beginning at 3 p.m. Wednesday, August 22 until 9 p.m. Friday, August 24.

JUSTIFICATION: During last night's 6 hour fishing period 8 permit holders caught 973 chum salmon. Catches and fishing effort were well below average because of weather. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-35-12 Effective Date: August 23, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District daily for 5-hour fishing periods from the hours of 7 a.m. to 12 p.m. beginning on Thursday, August 23 and ending at 12:00 p.m. Sunday, August 26.

JUSTIFICATION: There is a small market buyer interested in buying salmon from two to three permit holders. Compared to over 80 permit holders fishing this season when the major seafood company is buying during a mid-afternoon and early evening fishery the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-36-12 Effective Date: August 26, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 6 hour fishing period from the hours of 3 p.m. Sunday, August 26 until 9 p.m. Sunday, August 26.

JUSTIFICATION: Last week stormy weather resulted in fishing effort and catches well below average and only 5,500 chum salmon were caught. The cumulative catch is now over 222,000 chum salmon and may reach the forecast harvest of 250,000 to 280,000 this season if the weather improves. The Kobuk River test fish project has completed operations and the test fish index ranks 3rd best in the 20-year project history. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-37-12 Effective Date: August 27, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for a 4-hour fishing period from the hours of 9 a.m. to 1 p.m. on Monday, August 27.

JUSTIFICATION: There is a small market buyer interested in buying salmon from two to three permit holders. Compared to over 70 permit holders fishing this season when the major seafood company is buying during an evening fishery the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-38-12 Effective Date: August 27, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 6 hour fishing period from the hours of 3 p.m. Monday, August 27 until 9 p.m. Monday, August 27.

-continued-

JUSTIFICATION: During last night's 6-hour fishing period 10 fishermen caught 673 chum salmon. Fishing effort and catches well below average. The cumulative catch is now over 223,000 chum salmon and with this week likely being the last week of the fishery the forecast harvest of 250,000 to 280,000 is not expected to be reached. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-39-12 Effective Date: August 28, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for four 6-hour fishing periods daily from the hours of 7 a.m. to 1 p.m. beginning 7 a.m. Tuesday, August 28 and ending 1 p.m. Friday, August 31.

JUSTIFICATION: There is a small market buyer interested in buying salmon from two to three permit holders. Compared to 81 permit holders fishing this season when the major seafood company is buying during an evening fishery the small effort should not jeopardize making escapement goals or subsistence opportunity.

Emergency Order: 3-S-X-40-12 Effective Date: August 28, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for one 6 hour fishing period from the hours of 3 p.m. until 9 p.m. Tuesday, August 28.

JUSTIFICATION: During last night's 6-hour fishing period 14 fishermen caught 897 chum salmon. Fishing effort and catches well below average. The cumulative catch is over 224,000 chum salmon and with this week likely being the last week of the fishery the forecast harvest of 250,000 to 280,000 is not expected to be reached. Continuing with short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

Emergency Order: 3-S-X-41-12 Effective Date: August 29, 2012

EXPLANATION: This emergency order opens commercial salmon fishing in the Kotzebue District for three 6 hour fishing periods from the hours of 3 p.m. to 9 p.m. daily beginning at 3 p.m. Wednesday, August 29 until 9 p.m. Friday, August 31.

JUSTIFICATION: During last night's 6 hour fishing period 11 permit holders caught 416 chum salmon. Catches and fishing effort were well below average. Catches for the last week have been under 1,000 chum salmon per fishing period and fishing effort continues to be below average. Friday night's fishing period will be last commercial salmon fishing period of the season. Having three short duration openings should not jeopardize escapement and allow for subsistence fishing opportunity.

NORTON SOUND SALMON

Emergency Order: 3-S-Z-01-12 Effective Date: June 15, 2012

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 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 2012 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

-continued-

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-02-12 Effective Date: June 24, 2012

EXPLANATION: This emergency order closes all marine waters in Subdistrict 6, Unalakleet Subdistrict, and all waters of the Unalakleet River drainage and all marine waters in Subdistrict 5, Shaktoolik Subdistrict to subsistence salmon fishing beginning noon on Sunday, June 24. Effective Monday, June 25, Subdistricts 5 and 6 will reopen to subsistence salmon fishing with set gillnets based on a schedule of two 48-hour periods per week (from 6 p.m. Monday until 6 p.m. Wednesday and from 6 p.m. Thursday until 6 p.m. Saturday) in the marine waters, and two 36-hour fishing periods per week (from 8 a.m. Monday until 8 p.m. Tuesday and from 8 a.m. Friday until 8 p.m. Saturday) in the Unalakleet River drainage.

JUSTIFICATION: Subdistricts 5 and 6 Chinook salmon was designated a stock of yield concern by the Alaska Board of Fisheries in 2004. The subsistence fishing schedule was a measure adopted by the BOF aimed at increasing escapements of Chinook salmon into the Shaktoolik and Unalakleet River drainages to rebuild these stocks to historical levels of abundance. Additional restrictions and early closures to sport and subsistence fisheries are possible this season based on the trend of poor Chinook salmon runs elsewhere in western Alaska. High proportions of age-4 Chinook salmon were observed at Unalakleet River salmon stock assessment projects in 2011 indicating good survival for the 2007 brood year and perhaps an improved run outlook for 2012. However, Chinook salmon runs in 2012 are thus far tracking well below forecasted levels of abundance throughout Alaska. Consequently, severe restrictions and closures have been taken in other areas in order to meet Chinook salmon escapement needs. Similar restrictive measures may be necessary in southern Norton Sound to reach escapement goals for Chinook salmon.

Emergency Order: 3-S-Z-03-12 Effective Date: June 27, 2012

EXPLANATION: Effective 6:00 p.m. Wednesday evening, June 27, 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, 7 days a week. 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.

JUSTIFICATION: Using beach seines to target abundant chum and pink salmon will provide subsistence users with additional opportunity to target these species and take advantage of good drying weather. By regulation, beach seines are permitted in the Unalakleet River after July 16 and beach seines are legal subsistence gear at all times in the Shaktoolik River. This emergency order is consistent with regulation except that it prohibits the use of beach seines to harvest Chinook salmon and provides beach seining opportunities for salmon in the marine waters of Subdistricts 5 and 6. All Chinook salmon caught in beach seines while targeting other salmon are required to be released immediately into the water.

Emergency Order: 3-S-Z-04-12 Effective Date: July 2, 2012

EXPLANATION: This emergency order extends beach seining for an additional week in Nome Subdistrict.

JUSTIFICATION: 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 the second week of July.

Emergency Order: 3-S-Z-05-12 Effective Date: July 3, 2012

EXPLANATION: This emergency order opens Subdistrict 4 (Norton Bay Subdistrict) to one 48-hour period from 6:00 p.m. Tuesday, July 3 to 6:00 p.m. Thursday, July 4. Permit holders in Subdistrict 4 are limited to 100 fathoms

-continued-

of net in aggregate length and set gillnets must have a stretched-mesh size no greater than four and one-half inches.

JUSTIFICATION: This index opening will provide opportunity to gauge early run strength of the pink salmon run to Norton Bay and utilize projected commercial harvest surpluses of pink salmon. Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-06-12 Effective Date: July 3, 2012

EXPLANATION: This emergency order opens Subdistricts 5 and 6 of the Norton Sound Dstrict to one 12-hour period from 12:00 noon to 12:00 midnight Tuesday evening, July 3. 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 four and one-half inches.

JUSTIFICATION: This index opening will provide opportunity to gauge early run strength of the pink salmon run to Subdistricts 5 and 6 and utilize projected commercial harvest surpluses of pink salmon. Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-07-12 Effective Date: July 5, 2012

EXPLANATION: This emergency order reopens Subdistrict 5 of the Norton Sound District to one 12-hour period from 12:00 noon to 12:00 midnight Thursday evening, July 5. Permit holders in Subdistrict 5 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than four and one-half inches.

JUSTIFICATION: This index opening will provide opportunity to target pink salmon for commercial purposes in Subdistrict 5. No Chinook salmon were reported harvested during the previous index opening of 12 hours in the Shaktoolik Subdistrict. Thus, continued brief directed pink salmon openings should jeopardize Chinook salmon subsistence catches or escapement needs to the Shaktoolik River. Chinook salmon will also not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-08-12 Effective Date: July 5, 2012

EXPLANATION: This emergency order opens Subdistrict 6 of the Norton Sound District to one 24-hour period from 12:00 noon July 5 to 12:00 noon, July 6. Permit holders in Subdistrict 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.

JUSTIFICATION: This index opening will provide opportunity to gauge early run strength of chum salmon to Subdistrict 6 and utilize projected commercial harvest surplus of chum salmon. Subsistence catches of chum salmon have increased dramatically over the last two days. Daily test fishery catches of chum salmon have also doubled since July 3rd further indicating that chum salmon run strength is building. This period will also provide an opportunity to evaluate incidental harvest of Chinook salmon in commercial 6-inch mesh set net gear, which will factor in to determining the location and extent of future openings directed on chum salmon. Any Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-09-12 Effective Date: July 6, 2012

EXPLANATION: This emergency order opens Subdistrict 5 of the Norton Sound District to one 24-hour period

-continued-

from 6:00 p.m. Friday, July 6 to 6:00 p.m. Saturday, July 7. 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.

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. Daily marine test fishery catches of chum salmon have also tripled since July 3rd further indicating that chum salmon run strength is building. This fishing period will also provide an opportunity to evaluate incidental harvest of Chinook salmon in commercial 6-inch mesh set net gear, which will factor in to determining the location and extent of future openings directed on chum salmon in Subdistrict 5. Any Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-10-12 Effective Date: July 6, 2012

EXPLANATION: This emergency order opens Subdistrict 6 of the Norton Sound Subdistrict, the Unalakleet Subdistrict to one 24-hour period from 6:00 p.m. Friday, July 6 to 6:00 p.m. Saturday, July 7. Permit holders in Subdistrict 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than four and one-half inches.

JUSTIFICATION: This opening will provide opportunity to target pink salmon in Subdistrict 6 for commercial purposes. No Chinook salmon were reported harvested incidentally during the previous directed pink salmon opening earlier this week. Thus, continued directed pink salmon fishing for brief periods should not jeopardize Chinook salmon for subsistence uses or negatively impact escapement of Chinook salmon into the Unalakleet River drainage. Most permit holders are deploying set net gear comprised of 4-inch mesh to target female pink salmon and maximize roe recovery from the harvest. The prevalent use of this smaller gear should further reduce incidental catches of Chinook salmon. A reminder to commercial permit holders that Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-11-12 Effective Date: July 7, 2012

EXPLANATION: This emergency order opens Subdistrict 3, the Elim Subdistrict of the Norton Sound District to commercial salmon fishing for 24 hours from 12:00 noon Saturday, July 7 to 12:00 noon Sunday, July 8. This emergency order also limits each permit holder to 100 fathoms of set gillnet gear in aggregate length with a mesh size of 4 ½ inches or less to target pink salmon.

JUSTIFICATION: Subdistricts 2 (Golovin) and 3 (Elim) are forecasted to have a strong even year pink run that will easily provide for subsistence uses of pink salmon and sizeable commercial harvest surpluses. However, the directed pink salmon fishery has been delayed thus far because of chum salmon conservation concerns. The Subdistricts 2 and 3 salmon management plan directs the department to not allow directed pink salmon fishing unless chum salmon escapement goals to the Niukluk and Kwiniuk Rivers are projected to be achieved. The chum salmon run to Norton Sound is tracking extremely late, but low percentages of age-0.3 chum salmon were observed throughout northern Norton Sound last year indicating poor survival for the 2007 brood year. Furthermore, age-0.2 chum salmon were also observed in very low numbers indicating that ocean conditions may not have been favorable for the 2008 brood year. Escapement goals were also not achieved on the Niukluk and Kwiniuk Rivers during the 2008 season. This all adds up to a forecasted chum salmon run that might not be sufficient to meet escapement goals and subsistence needs. Regardless of chum salmon abundance, the management plan directs the department to allow pink salmon commercial fishing opportunity for pink salmon after July 7 in the Elim Subdistrict and July 15 in the Golovin Subdistrict, the historical midpoint of chum salmon runs to the Kwiniuk and Niukluk River towers, respectively. Beyond this date, the assertion is that the majority of chum salmon will be in river or in estuaries and protected from commercial fishing gear. If the chum salmon run is late and incidental harvests of chum salmon are high during this index opening, the department will delay scheduling the next opening to provide an escapement window for chum salmon in Elim Subdistrict.

-continued-

Emergency Order: 3-S-Z-12-12 Effective Date: July 8, 2012

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound District to one 48-hour period from 6:00 p.m. Sunday, July 8 to 6:00 p.m. Tuesday, July 10. 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 four and one-half inches.

JUSTIFICATION: This opening will provide additional opportunity to utilize pink salmon commercial harvest surpluses in the Norton Bay Subdistrict. Recent catches from the previous 48-hour opening were 500 chum salmon and 13,774 pink salmon by 6 permit holders; 7 Chinook salmon were also harvested incidentally and retained for personal use. Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-13-12 Effective Date: July 9, 2012

EXPLANATION: This emergency order reopens the southern half of Subdistrict 6 of the Norton Sound District to one 24-hour period from 12:00 noon July 9 to 12:00 noon, July 10. Permit holders in Subdistrict 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.

JUSTIFICATION: This index opening will provide additional opportunity to utilize chum salmon harvest surpluses in Subdistrict 6. Subsistence catches of chum salmon have increased dramatically over the last two days. Daily test fishery catches of chum salmon also spiked from July 5-8 further indicating that chum salmon run strength is building. This fishing period will also provide an opportunity to evaluate incidental harvest of Chinook salmon in commercial 6-inch mesh set net gear, which will factor in to determining the location and extent of future openings directed on chum salmon. Any Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-14-12 Effective Date: July 11, 2012

EXPLANATION: Effective 6:00 p.m. Wednesday, July 11, all freshwaters of the Shaktoolik and Unalakleet River drainages will close to subsistence salmon fishing with set gillnets. This emergency order also reopens all freshwaters of the Shaktoolik and Unalakleet River drainages to subsistence salmon fishing with set gillnets 7 days a week until midnight, Sunday evening, July 22, but set gillnets must have a mesh size no greater than 4 ½ inches.

JUSTIFICATION: Closures to the use of large-mesh set gillnets in the subsistence fishery will remain in effect until midnight Sunday evening, July 22. These management measures are necessary in order to ensure that Chinook salmon escapement goals in the Shaktoolik and Unalakleet River drainages will be achieved and future returns not jeopardized. Subsistence fishermen are also reminded that any Chinook salmon incidentally captured in beach seines used to target other salmon must be immediately released back into the water.

As of July 9, a total of 234 Chinook salmon have been enumerated at the North River salmon counting tower. Since 2008, 11-21% of the annual North River tower Chinook salmon passage has occurred by July 9. Late run timing assessment results in a projected Chinook salmon escapement to the North River between 1,100-2,100 Chinook salmon. Considering the late spring break up in Norton Sound, there is a strong possibility that the lower end of the tower-based escapement goal range of 1,200-2,600 Chinook salmon could be achieved. Only 62 Chinook salmon have been enumerated at the Unalakleet River weir. However, Chinook salmon are most likely milling in deeper pools in the lower mainstem of the Unalakleet River in response to low water levels in the upper mainstem of the Unalakleet River. Regardless, these inriver closures are necessary if there is to be any chance of reaching escapement goals.

Emergency Order: 3-S-Z-15-12 Effective Date: July 11, 2012

-continued-

EXPLANATION: This emergency order closes the marine waters of Subdistricts 5 and 6 of the Norton Sound District effective 6:00 p.m. Wednesday, July 11 to subsistence fishing with set gillnets. This emergency order also suspends the weekly salmon gillnet fishing schedule and reopens the marine waters of Subdistricts 5 and 6 to subsistence salmon fishing 7 days a week to set gillnets with a mesh size of 6 inches or less until midnight Sunday evening, July 22.

JUSTIFICATION: This closure to the use of large-mesh set gillnets in the marine subsistence fishery will remain in effect until midnight Sunday evening, July 22. These measures are necessary in order to ensure that Chinook salmon escapement goals in the Shaktoolik and Unalakleet River drainages will be achieved and future returns not jeopardized.

Emergency Order: 3-S-Z-16-12 Effective Date: July 10, 2012

EXPLANATION: This emergency order reopens Subdistrict 5 of the Norton Sound District to one 24-hour period from 12:00 noon Tuesday, July 10 to 12:00 noon Wednesday, July 11. Permit holders in Subdistrict 5 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than four and one-half inches.

JUSTIFICATION: This opening will provide opportunity to utilize commercial harvest surpluses of pink salmon in Subdistrict 5. Escapement and subsistence needs of pink salmon will be easily achieved in southern Norton Sound and will not be jeopardized by this opening. Only 3 Chinook salmon were reported harvested during the previous opening of 12 hours in the Shaktoolik Subdistrict. Thus, continued brief directed pink salmon openings should not jeopardize Chinook salmon subsistence catches or escapement needs to the Shaktoolik River. Chinook salmon will also not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-17-12 Effective Date: July 11, 2012

EXPLANATION: This emergency order reopens Subdistrict 6 of the Norton Sound District to one 24-hour period from 12:00 p.m. Wednesday, July 11 to 12:00 p.m. Thursday, July 12. Permit holders in Subdistrict 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than four and one-half inches.

JUSTIFICATION: This opening will provide additional opportunity to target pink salmon in Subdistrict 6 for commercial purposes. Catches from the last period were 27,000 pink salmon by 21 permit holders for 24 hours. The tender reached capacity early and many permit holders pulled out early so catches could have been much higher. Only 4 Chinook salmon were reported harvested incidentally during this opening. Therefore, this brief directed pink salmon period should not jeopardize subsistence uses or escapement needs of pink salmon and there should be minimal adverse impacts to Chinook salmon subsistence uses or escapement of Chinook salmon into the Unalakleet River drainage. Most permit holders are deploying set net gear comprised of 4-inch mesh to target female pink salmon and maximize roe recovery from the harvest. The prevalent use of this smaller gear should further reduce incidental catches of Chinook salmon. A reminder to commercial permit holders that Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-18-12 Effective Date: July 10, 2012

EXPLANATION: This emergency order reopens Subdistrict 3 (Elim Subdistrict) to commercial salmon fishing for 24 hours from 12:00 noon Tuesday, July 10 to 12:00 noon Wednesday, July 11. This emergency order also limits each permit holder to 100 fathoms of set gillnet gear in aggregate length with a mesh size of 4 ½ inches or less to target pink salmon.

JUSTIFICATION Catches from the first 24 hour fishing period in Elim were 300 chum salmon and 5,500 pink

-continued-

salmon by 7 permit holders. This opening will provide some commercial harvest of pink salmon while safeguarding chum salmon from being harvested incidentally in commercial set nets. Incidental chum salmon harvest in the Elim Subdistrict will be evaluated to determine the timing and extent of subsequent commercial periods so that pink salmon harvests can be maximized while conserving chum salmon for subsistence needs and escapement to the Kwiniuk and Tubutulik River drainages.

Emergency Order: 3-S-Z-19-12 Effective Date: July 12, 2012

EXPLANATION: This emergency order reopens Subdistrict 5 of the Norton Sound District to one 24-hour period from 12:00 p.m. Thursday, July 12 to 12:00 p.m. Friday, July 13. Permit holders in Subdistrict 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.

JUSTIFICATION: This opening will provide additional opportunity to utilize chum salmon commercial harvest surpluses in Subdistrict 5. Commercial harvest of chum salmon during the previous 24-hour directed chum salmon opening was 4,902 chum salmon by 11 permit holders. Catch per unit of effort for this period was 18.60, the second best on record and was 340% above the long-term average CPUE of 4.19. There was 1 Chinook salmon retained for personal use during this opening. Continued directed fishing on chum salmon is warranted based on very strong catches of chum salmon and low incidental harvests of Chinook salmon. Additionally, alternating pink and chum salmon openings are providing sufficient opportunity for chum salmon to enter the Shaktoolik River drainage to meet subsistence and escapement needs. Any Chinook salmon incidentally harvested this season will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-20-12 Effective Date: July 11, 2012

EXPLANATION: This emergency order allows beach seining for an additional week in Nome Subdistrict marine waters during the scheduled gillnet fishing period and one additional fishing period in fresh waters during the scheduled gillnet fishing period.

JUSTIFICATION: Pink salmon are showing increasing strength in Nome Subdistrict rivers and the escapement goal is projected to be met. Allowing beach seines to be used will provide additional fishing opportunity during the better drying weather.

Emergency Order: 3-S-Z-21-12 Effective Date: July 12, 2012

EXPLANATION: This emergency order supersedes emergency order 3-S-Z-19-12 and postpones the 12:00 noon July 12 opening by 6 hours in Norton Sound Subdistrict 5, the Shaktoolik Subdistrict. This emergency order reschedules the July 12 opening so that commercial salmon fishing is open from 6:00 p.m. Thursday, July 12 to 6:00 p.m. Friday, July 13. Permit holders in Subdistrict 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.

JUSTIFICATION: This opening was rescheduled at the request of the buyer to allow the tender vessel Egavik time to reach the Shaktoolik fishing grounds. Egavik was delayed during its most recent offload at the processing vessel Norton Sound. This opening will provide additional opportunity to utilize chum salmon commercial harvest surpluses in Subdistrict 5. Commercial harvest of chum salmon during the previous 24-hour directed chum salmon opening was 4,902 chum salmon by 11 permit holders. Catch per unit of effort for this period was 18.60, the second best on record and was 340% above the long-term average CPUE of 4.19. There was 1 Chinook salmon retained for personal use during this opening. Continued directed fishing on chum salmon is warranted based on very strong catches of chum salmon and low incidental harvests of Chinook salmon. Additionally, alternating pink and chum salmon openings are providing sufficient opportunity for chum salmon to enter the Shaktoolik River drainage to meet subsistence and escapement needs. Any Chinook salmon incidentally harvested this season will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

-continued-

Emergency Order: 3-S-Z-22-12 Effective Date: July 12, 2012

EXPLANATION: This emergency order reopens Subdistrict 6 of the Norton Sound District to one 24-hour period from 6:00 p.m. Thursday, July 12 to 6:00 p.m. Friday, July 13. Permit holders in Subdistrict 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than four and one-half inches.

JUSTIFICATION: Additional commercial fishing directed on pink salmon is warranted because the North River tower-based escapement goal of greater than 25,000 pink salmon is projected to be achieved and subsistence needs of pink salmon will be met. Additionally, over 126,000 pink salmon have been enumerated at the Unalakleet River weir.

This opening will provide additional opportunity to target pink salmon in Subdistrict 6 for commercial purposes. Catches from the last period were 27,000 pink salmon by 21 permit holders for 24 hours. The tender reached capacity early and many permit holders pulled out early so catches could have been much higher. Only 4 Chinook salmon were reported harvested incidentally during this opening. Therefore, this brief directed pink salmon period should not jeopardize subsistence uses or escapement needs of pink salmon and there should be minimal adverse impacts to Chinook salmon subsistence uses or escapement of Chinook salmon into the Unalakleet River drainage. Most permit holders are deploying set net gear comprised of 4-inch mesh to target female pink salmon and maximize roe recovery from the harvest. The prevalent use of this smaller gear should further reduce incidental catches of Chinook salmon. A reminder to commercial permit holders that Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-23-12 Effective Date: July 14, 2012

EXPLANATION: This emergency order reopens Subdistrict 3 (Elim Subdistrict) to commercial salmon fishing for 12 hours from 12:00 noon to 12:00 midnight Saturday evening, July 14. This emergency order also limits each permit holder to 100 fathoms of set gillnet gear in aggregate length with a mesh size of 4 ½ inches or less to target pink salmon.

JUSTIFICATION: The Kwiniuk River tower-based escapement goal of greater than 8,400 pink salmon has been exceeded and subsistence needs of pink salmon to the Elim Subdistrict will easily be achieved. This brief opening with small mesh gear will provide some additional commercial harvest of pink salmon while minimizing incidental harvest of chum salmon in commercial set nets.

Emergency Order: 3-S-Z-24-12 Effective Date: July 13, 2012

EXPLANATION: This emergency order waives the subsistence pink salmon catch limit in Nome Subdistrict.

JUSTIFICATION: Based on aerial observations the pink salmon escapement goal should be reached in the next few days. The historical midpoint of the pink salmon run is usually mid-July. Waiving the pink salmon limit will allow those subsistence permit holders that desire more than the initial catch limit listed on the permit to harvest surplus pink salmon.

Emergency Order: 3-S-Z-25-12 Effective Date: July 14, 2012

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound District, for one 12-hour period from 12:00 noon to 12:00 midnight, Saturday evening, 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 four and one-half inches.

JUSTIFICATION: This opening will provide additional opportunity to utilize pink salmon commercial harvest surpluses in the Norton Bay Subdistrict. Recent catches from the previous 48-hour opening were 541 chum salmon

-continued-

and 22,579 pink salmon by 11 permit holders. Commercial pink salmon harvests have been record-setting in the Norton Bay Subdistrict and further fishing is warranted. Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-26-12 Effective Date: July 15, 2012

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound District for one 24-hour period from 12:00 noon Sunday, July 15 to 12:00 noon, Monday, July 16. 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 four and one-half inches.

JUSTIFICATION: This opening will provide additional opportunity to utilize pink salmon commercial harvest surpluses in the Norton Bay Subdistrict. Recent catches from the previous 48-hour opening were 541 chum salmon and 22,579 pink salmon by 11 permit holders. Commercial pink salmon harvests have been record-setting in the Norton Bay Subdistrict and further fishing is warranted. Chinook salmon incidentally harvested during this opening will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-27-12 Effective Date: July 14, 2012

EXPLANATION: This emergency order reopens Subdistrict 2 of the Norton Sound District to commercial salmon fishing for two 24-hour periods directed at pink salmon from 12:00 noon Saturday, July 14 to 12:00 noon Sunday, July 15, and from 12:00 noon Monday, July 16 to 12:00 noon, Tuesday, July 17. Permit holders are restricted to gillnets with a mesh size of four and one-half inches or less.

JUSTIFICATION: The Niukluk River pink salmon SEG of greater than 10,500 pink salmon has been achieved and subsistence needs of pink salmon will easily be met in the Golovin Subdistrict. Additionally, the chum salmon SEG (>23,000) is projected to be achieved based on other late years.

Emergency Order: 3-S-Z-28-12 Effective Date: July 16, 2012

EXPLANATION: This emergency order reopens Subdistrict 3 of the Norton Sound District to commercial salmon fishing for 48 hours from 12:00 noon Monday, July 16 to 12:00 noon Wednesday, July 18. This emergency order also limits each permit holder to 100 fathoms of set gillnet gear in aggregate length with a mesh size of 4 ½ inches or less to target pink salmon.

JUSTIFICATION: The Kwiniuk River tower-based escapement goal of greater than 8,400 pink salmon has been exceeded and subsistence needs of pink salmon to the Elim Subdistrict will easily be achieved. Commercial catches during the most recent 24-hour opening in Elim were 11,652 pink salmon and 612 chum salmon by 9 permit holders. The CPUE index for pink salmon this period was 54 index points which was 411% above the long-term mid-July average CPUE index of 11.65. Further commercial fishing directed at pink salmon is warranted. This brief opening with small mesh gear will provide some additional commercial harvest of pink salmon while minimizing incidental harvest of chum salmon in commercial set nets.

Emergency Order: 3-S-Z-29-12 Effective Date: July 14, 2012

EXPLANATION: This emergency order reopens Norton Sound Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, to commercial salmon fishing for 48 hours from 6:00 p.m. Saturday, July 14 to 6:00 p.m. Monday, July 16. Permit holders in Subdistricts 5 and 6 are limited to 100 fathoms of net in aggregate length and set gillnets must have a mesh size no greater than 6 inches.

JUSTIFICATION: Continued directed fishing on chum salmon is warranted based on very strong catches of chum

-continued-

salmon and low incidental harvests of Chinook salmon. Escapement of chum salmon to the Unalakleet River weir is over 24,000 fish and the aerial survey SEG range of 2,400-4,800 will easily be achieved. Apportioned sonar passage estimates of chum salmon to the Shaktoolik River approximate 14,000 chum salmon which is sufficient to provide for escapement and inriver subsistence uses of chum salmon. Any Chinook salmon incidentally harvested this season will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

Emergency Order: 3-S-Z-30-12 Effective Date: July 16, 2012

EXPLANATION: This emergency order allows beach seining for an additional week in Nome Subdistrict marine waters and fresh water subsistence areas during the scheduled gillnet fishing periods.

JUSTIFICATION: The pink salmon escapement goal has been reached in Nome Subdistrict. Allowing beach seines to be used will provide additional fishing opportunity.

Emergency Order: 3-S-Z-31-12 Effective Date: July 18, 2012

EXPLANATION: This emergency order reopens Subdistrict 2 of the Norton Sound District, to commercial salmon fishing for one 72-hour period from 12:00 noon Wednesday, July 18 to 12:00 noon Saturday, July 21 and one 48-hour period from 12:00 noon Sunday, July 22 to 12:00 noon Tuesday, July 24. These periods are directed at pink salmon and permit holders will be restricted to gillnets with a mesh size of four and one-half inches or less.

JUSTIFICATION: The Niukluk River pink salmon SEG of greater than 10,500 pink salmon has been achieved and subsistence needs of pink salmon will easily be met in the Golovin Subdistrict. After July 15, the department is directed to allow commercial pink salmon fishing if it is determined that a commercial pink salmon fishery will not have a significant impact on reaching the Niukluk River tower chum salmon escapement goal or subsistence uses of chum salmon. After July 15, the historical midpoint of the Niukluk River chum salmon run, the majority of chum salmon should be in the Fish River drainage. The chum salmon SEG greater than 23,000 is projected to be achieved this season based on other late run timing years.

Emergency Order: 3-S-Z-32-12 Effective Date: July 18, 2012

EXPLANATION: This emergency order reopens Norton Sound Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, to a commercial chum salmon fishing schedule of two 48-hour periods per week for the remainder of July that will conclude at 6:00 p.m. Tuesday, July 31. 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 during this schedule will be limited to 100 fathoms of net in aggregate length and set gillnets must have a mesh size no greater than 6 inches.

JUSTIFICATION: Continued directed fishing on chum salmon is warranted based on very strong catches of chum salmon and low incidental harvests of Chinook salmon. Escapement of chum salmon to the Unalakleet River weir is nearly 29,000 fish and the aerial survey SEG range of 2,400-4,800 will easily be achieved. Apportioned sonar passage estimates of chum salmon to the Shaktoolik River approximate 19,000 chum salmon which is sufficient to provide for escapement and inriver subsistence uses of chum salmon. The chum salmon run to Subdistricts 5 and 6 of the Norton Sound District is average and will easily provide for subsistence uses of chum salmon. The Unalakleet River test fishery catch of chum salmon is 520 chum salmon which is slightly above the long-term average catch of 497 chum salmon, excluding the record test net catches from 2008-2011.

Chinook salmon conservation concerns have limited commercial salmon fishing effort in Subdistricts 5 and 6 through mid-July. Chum salmon commercial catches and CPUE have been above average in the Shaktoolik Subdistrict and Unalakleet Subdistricts. The schedule in Subdistricts 5 and 6 will allow for an orderly fishery for the remainder of the chum salmon run to these areas. Any Chinook salmon incidentally harvested this season will not be purchased by the buyer and must be retained for subsistence purposes. Chinook salmon incidental harvests must also be recorded in the personal use section of the fish ticket at the time of delivery.

-continued-

Emergency Order: 3-S-Z-33-12 Effective Date: July 19, 2012

EXPLANATION: This emergency order reopens Subdistrict 3 to commercial salmon fishing for 72 hours from 12:00 noon Thursday, July 19 to 12:00 noon Sunday, July 22. This emergency order also limits each permit holder to 100 fathoms of set gillnet gear in aggregate length with a mesh size of 4 ½ inches or less to target pink salmon.

JUSTIFICATION: The Kwiniuk River escapement goal of greater than 8,400 pink salmon has been exceeded and subsistence needs of pink salmon to the Elim Subdistrict will easily be achieved. Commercial catches during the July 14th 12-hour opening in Elim were 10,738 pink salmon and 273 chum salmon by 13 permit holders. The CPUE index for pink salmon this period was 68 index points which was just below the record CPUE of 69 index points. Further commercial fishing directed at pink salmon is warranted. After July 6, the department is directed to allow commercial pink salmon fishing if it is determined that a commercial pink salmon will not have a significant impact on escapement goals or subsistence uses of chum salmon. This upcoming opening with small mesh gear will provide some additional commercial harvest opportunity for pink salmon. Southwesterly storms have precluded fishing operations in Elim for the current opening.

Emergency Order: 3-S-Z-34-12 Effective Date: July 19, 2012

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound District for two 36-hour periods from 12:00 noon Thursday, July 19 to 12:00 midnight Friday evening, July 20, and from 12:00 noon, Sunday, July 22 to 12:00 midnight Monday evening, July 23. Permit holders in Subdistrict 4 will be limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: This opening will provide opportunity to utilize chum salmon commercial harvest surpluses in the Norton Bay Subdistrict. Commercial pink salmon harvests have been record-setting in the Norton Bay Subdistrict but pink salmon harvests have become increasingly watermarked and the buyer would prefer to direct future openings on chum salmon. Escapement of chum salmon to the Norton Bay Subdistrict as indexed by the Inglutalik River tower counts is nearly 20,000 chum salmon. This estimate of chum salmon passage should easily provide for subsistence harvests upstream of the tower and escapement needs to provide for future returns.

Emergency Order: 3-S-Z-35-12 Effective Date: July 20, 2012

EXPLANATION: This emergency order closes the Pilgrim River and lower Kuzitrin River, from 300 yards upstream of the Pilgrim River confluence to the Kuzitrin River mouth, to the use of gillnets and seines for all species of fish.

JUSTIFICATION: Sockeye salmon escapement past the Pilgrim River weir has been lagging since last weekend. The average historical midpoint at the weir is July 18 and escapement projections show that the escapement goal at Salmon Lake will not be met at current passage rates. The escapement goal at Salmon Lake is 4,000 to 8,000 sockeye salmon observed by aerial survey. To have any chance of reaching the escapement goal, all gillnetting and seining must be closed in the Pilgrim River drainage and the lower Kuzitrin River.

Emergency Order: 3-S-Z-36-12 Effective Date: July 21, 2012

EXPLANATION: This emergency order supersedes Emergency Order 3-S-Z-31-12 and extends the 72-hour period for Subdistrict 2, the Golovin Subdistrict, of the Norton Sound District, originally scheduled from 12:00 noon Wednesday, July 18 to 12:00 noon Saturday, July 21 by an additional 24 hours. This action effectively creates one 144-hour period because it will run into the previously scheduled 48-hour period from 12:00 noon Sunday, July 22 to 12:00 noon Tuesday, July 24. This fishing period is directed at pink salmon and permit holders will be restricted to gillnets with a mesh size of four and one-half inches or less.

JUSTIFICATION: Southwesterly winds kept commercial fishermen on the beach in most Norton Sound Subdistricts over the last few days. High surf conditions are also expected as early as Monday, July 23 which may further reduce commercial fishing opportunity during openings early next week. Therefore, the 72-hour period currently in

-continued-

progress for the Golovin Subdistrict is being extended by 24 hours each to provide additional opportunity to utilize commercial pink salmon harvest surpluses.

Emergency Order: 3-S-Z-37-12 Effective Date: July 22, 2012

EXPLANATION: This emergency order supersedes Emergency Order 3-S-Z-33-12 and extends the 72-hour period for Subdistrict 3 of the Norton Sound District, originally scheduled from 12:00 noon Thursday, July 19 to 12:00 noon Sunday, July 22 by an additional 24 hours. This period will now conclude at 12:00 noon Monday, July 23. This emergency order also limits each permit holder to 100 fathoms of set gillnet gear in aggregate length with a mesh size of 4 ½ inches or less to target pink salmon.

JUSTIFICATION: Southwesterly winds kept commercial fishermen on the beach in most Norton Sound Subdistricts over the last few days. High surf conditions are also expected as early as Monday, July 23 which may further reduce commercial fishing opportunity during openings early next week. Therefore, the 72-hour period currently in progress for the Golovin Subdistrict is being extended by 24 hours each to provide additional opportunity to utilize commercial pink salmon harvest surpluses.

Emergency Order: 3-S-Z-38-12 Effective Date: July 20, 2012

EXPLANATION: This emergency order supersedes Emergency Order 3-S-Z-32-12 and extends the ongoing 48-hour period by 24 hours for Norton Sound Subdistricts 5 and 6. This emergency order extends the period originally scheduled from 6:00 p.m. Wednesday, July 18 to 6:00 p.m. Friday, July 20 to the new closure time of 6:00 p.m. Saturday, July 21. Subdistricts 5 and 6 will resume on the schedule of two 48-hour periods per week at 6:00 p.m. Sunday, July 22. Permit holders in Subdistricts 5 and 6 during this extended period will be limited to 100 fathoms of net in aggregate length and set gillnets must have a mesh size no greater than 6 inches.

JUSTIFICATION: Southwesterly winds kept commercial fishermen on the beach in most Norton Sound Subdistricts over the last few days. High surf conditions are also expected as early as Monday, July 23 which may further reduce commercial fishing opportunity during openings early next week. Therefore, openings currently in progress for the Shaktoolik and Unalakleet Subdistricts will be extended by 24 hours each to provide additional opportunity to utilize commercial chum salmon harvest surpluses. Shaktoolik and Unalakleet Subdistricts will return to the schedule of two 48-hour periods week at 6:00 p.m. Sunday, July 22.

Emergency Order: 3-S-Z-39-12 Effective Date: July 26, 2012

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound District, for one 48-hour period from 6:00 p.m. Thursday, July 26 to 6:00 p.m. Saturday, July 28. Permit holders in Subdistrict 4 will be limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: This opening will provide opportunity to utilize chum salmon commercial harvest surpluses in the Norton Bay Subdistrict. Escapement of chum salmon to the Norton Bay Subdistrict as indexed by the Inglutalik River tower counts is nearly 30,000 chum salmon. This estimate of chum salmon passage should easily provide for subsistence harvests upstream of the tower and escapement needs to provide for future returns.

Emergency Order: 3-S-Z-40-12 Effective Date: July 26, 2012

EXPLANATION: This emergency order sets the Subdistrict 1 subsistence salmon fishing schedule beginning July 26 and continues allowing 5 days per week fishing as stated in regulation from 6:00 p.m. Monday to 6:00 p.m. Saturday. Fresh water fishing times remain the same.

JUSTIFICATION: The department forecast for 2012 is that the coho salmon run will be average and by regulation subsistence fishing is open 6 p.m. Monday to 6 p.m. Saturday in the marine waters unless there is a concern that escapement goals will not be met. The fresh water schedule is from 6 p.m. Monday to 6 p.m. Wednesday and from 6

-continued-

p.m. Thursday until 6 p.m. Saturday.

Emergency Order: 3-S-Z-41-12 Effective Date: July 26, 2012

EXPLANATION: This emergency order reopens Subdistrict 2 of the Norton Sound District, to commercial salmon fishing for one 36-hour period from 12:00 noon Thursday, July 26 to 12:00 midnight Friday evening, July 27. 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 allow some late season chum salmon harvest. Late run timing models show that the Niukluk River tower chum salmon escapement goal of 23,000 is projected to be achieved. 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-42-12 Effective Date: July 29, 2012

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound District, to a commercial fishing schedule of two 48-hour periods per week beginning 6:00 p.m. Sunday, July 29 and ending at 6:00 p.m. Friday, August 10. Periods during this schedule will be from 6:00 p.m. Sundays to 6:00 p.m. Tuesdays, and 6:00 p.m. Wednesdays to 6:00 p.m. Fridays. Permit holders in Subdistrict 4 will be limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: This schedule will provide flexibility for the buyer and fishermen and will allow commercial harvests of late run chum salmon and coho salmon. Limited fishing effort and windows between periods should provide sufficient escapement opportunities for coho salmon to reach the spawning grounds of the Ungalik River and east fork of the Koyuk River, the major producers of coho salmon in Norton Bay. Nearly 30,000 chum salmon have been enumerated at the Inglutalik River tower operated by NSEDC which should easily provide for escapement needs. Aerial surveys will also be flown next week of the Ungalik and Inglutalik Rivers which had similar levels of chum salmon abundance in 2011. These aerial surveys will also provide an early assessment of coho salmon abundance in the lower reach of the Ungalik River.

Emergency Order: 3-S-Z-43-12 Effective Date: August 1, 2012

EXPLANATION: This emergency order opens Norton Sound Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, to commercial salmon fishing for 72 hours from 6:00 p.m. Wednesday, August 1 to 6:00 p.m. Saturday, August 4.

JUSTIFICATION: Catches from the most recent fishing period were 392 chum salmon and 1,169 coho salmon by 13 permit holders in Shaktoolik Subdistrict and 3,011 chum salmon and 2,665 coho salmon by 31 permit holders in Unalakleet Subdistrict. The combined catch of coho salmon for both subdistricts has exceeded the chum salmon catch and the department will now manage for coho salmon. The escapement counting projects are still counting more chum salmon than coho salmon as is expected. The chum salmon run this season was average. As the coho salmon run is in the early stages having an initial 72-hour coho salmon fishing period should not jeopardize escapement and should not limit subsistence fishing opportunity.

Emergency Order: 3-S-Z-44-12 Effective Date: August 6, 2012

EXPLANATION: This emergency order reopens Norton Sound Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, to commercial salmon fishing for 48 hours from 6:00 p.m. Monday, August 6 to 6:00 p.m. Wednesday, August 8.

JUSTIFICATION: Catches from the most recent fishing period in Shaktoolik and Unalakleet were 300 chum salmon and 900 coho salmon by 16 permit holders in Shaktoolik Subdistrict and 1,500 chum salmon and 2,700 coho salmon

-continued-

by 38 permit holders in Unalakleet Subdistrict. Silver catches were below average for this opening, but were affected by the weather limiting fishing time. As the coho salmon run is in the early stages having an additional 48-hour coho salmon fishing period should not jeopardize escapement and should not limit subsistence fishing opportunity. The department will consider committing to a commercial coho salmon fishing schedule once the upper end of the North River tower aerial survey SEG range (550-1,100) is projected to be reached. A higher level of inriver coho salmon abundance must be projected in order to provide for inriver subsistence uses of coho salmon and escapement needs.

Emergency Order: 3-S-Z-45-12 Effective Date: August 6, 2012

EXPLANATION: This emergency order sets the subsistence salmon catch limits on the Pilgrim and Kuzitrin River drainages.

JUSTIFICATION: Catch limits are still in effect for the Pilgrim River and Kuzitrin River. All catch limits are listed on the permits. Catch limits are needed because of the large number of permits compared to the number of fish available for harvest.

Emergency Order: 3-S-Z-46-12 Effective Date: August 11, 2012

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound District for one 72-hour period from 6:00 p.m. Saturday, August 11 to 6:00 p.m. Tuesday, August 14. Permit holders in Subdistrict 4 will be limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Continued commercial fishing directed at coho salmon is warranted in southern Norton Sound based on sufficient escapements and improved commercial catch rates. Coho salmon escapement to Norton Bay as indexed by Inglutalik River tower is 522 coho salmon, which is slightly ahead of the 519 coho salmon counted by this date last year. The nearby Ungalik River is the major producer of coho salmon in Norton Bay and had an aerial survey count of 1,850 coho salmon in 2011. Subsistence users from Koyuk report good catches of coho salmon in the lower reach of the Ungalik River this season. This opening will provide opportunity to utilize coho salmon surpluses.

Emergency Order: 3-S-Z-47-12 Effective Date: August 12, 2012

EXPLANATION: This emergency order reopens Norton Sound Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, to a commercial coho salmon fishing schedule of two 48-hour periods per week for the remainder of the commercial salmon season that will conclude at 6:00 p.m. Friday, September 7. 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 during this schedule will be limited to 100 fathoms of net in aggregate length and set gillnets must have a mesh size no greater than 6 inches.

JUSTIFICATION: Continued commercial fishing directed at coho salmon is warranted in southern Norton Sound based on sufficient escapements and improved commercial catch rates. Escapements of coho salmon into the Shaktoolik and Unalakleet River drainages are projected to be sufficient to reach escapement goals and provide for inriver subsistence harvests of coho salmon. Coho salmon passage through August 7 at North River tower is 1,854 coho salmon and projected escapement to North River based on normal run timing models is expected to exceed 6,000 coho salmon. Tower count assessments also indicate that upper end of the aerial survey SEG range of 550-1,100 coho salmon is expected to be met. Unalakleet River drainage wide estimated escapement is expected to range from 40,000-75,000 coho salmon. Apportioned sonar counts from the Shaktoolik River sonar project operated by NSEDC result in a current escapement estimate of 2,600 coho salmon. This directed coho salmon fishing schedule will provide for an orderly fishery and allow some flexibility for the buyer and fishermen to utilize coho salmon surpluses for the remainder of the season.

-continued-

Emergency Order: 3-S-Z-48-12 Effective Date: August 15, 2012

EXPLANATION: This emergency order reopens Subdistrict 4 of the Norton Sound District to a commercial fishing schedule of two 48-hour periods per week beginning 6:00 p.m. Wednesday, August 15 and ending at 6:00 p.m. Friday, September 7. Periods during this schedule will be from 6:00 p.m. Sundays to 6:00 p.m. Tuesdays, and 6:00 p.m. Wednesdays to 6:00 p.m. Fridays. Permit holders in Subdistrict 4 will be limited to 100 fathoms of net in aggregate length and set gillnets must have a stretched-mesh size no greater than 6 inches.

JUSTIFICATION: Continued commercial fishing directed at coho salmon is warranted in southern Norton Sound based on sufficient escapements and improved commercial catch rates. Coho salmon escapement to Norton Bay as indexed by Inglutalik River tower is 522 coho salmon, which is slightly ahead of the 519 coho salmon counted by this date last year. The nearby Ungalik River is the major producer of coho salmon in Norton Bay and had an aerial survey count of 1,850 coho salmon in 2011. Subsistence users from Koyuk report good catches of coho salmon in the lower reach of the Ungalik River this season. This directed coho salmon fishing schedule will provide for an orderly fishery and allow some flexibility for the buyer and fishermen to utilize coho salmon surpluses for the remainder of the season.

Emergency Order: 3-S-Z-49-12 Effective Date: August 12, 2012

EXPLANATION: This emergency order reopens Subdistrict 3 of the Norton Sound District to commercial salmon fishing for 24 hours from 6:00 p.m. Sunday, August 12 to 6:00 p.m. Monday, August 13. This emergency order also limits each permit holder to 100 fathoms of set gillnet gear in aggregate length with a mesh size of 6 inches or less.

JUSTIFICATION: Escapements of coho salmon into the Kwiniuk River as indexed by tower counts is the worst on record in twelve years of complete escapement estimates. On August 11, aerial surveys were flown of the lower reaches of the Tubutulik and Kwiniuk Rivers. The Tubutulik River east of Elim, is the other major salmon producing drainage in the Elim Subdistrict. Over 2,900 coho salmon were counted at the neighboring Tubutulik River from the mouth to Clear Creek, which was high for a partial survey conducted this early in the season. It is possible that a berm to the channel from Moses Point to Kwiniuk Inlet has impeded migration of salmon into the Kwiniuk River, thereby affecting the relative distribution of coho salmon in the Kwiniuk and Tubutulik Rivers. Regardless, while a record low 500 coho salmon have been counted at the Kwiniuk River tower, normal run timing models also result in a projected escapement of 1,700 coho salmon which indicates that the aerial survey SEG range of 650-1,300 coho salmon will be achieved. This index opening will provide an index of mid-season coho salmon run strength and provide limited commercial harvest opportunity. Subsistence users have spent the last two weeks targeting coho salmon during the hiatus in commercial fishing activity. Subsistence needs should therefore not be jeopardized by this brief mid-season opening. Escapements of coho salmon and commercial catch rates from these index openings will be evaluated before allowing additional commercial opportunity.

Emergency Order: 3-S-Z-50-12 Effective Date: August 14, 2012

EXPLANATION: This emergency order reopens Subdistrict 2 of the Norton Sound District, to commercial salmon fishing for one 36-hour period from 8:00 a.m. Tuesday, August 14 to 8:00 p.m. Wednesday, August 15. 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: Escapements of coho salmon into Niukluk River as indexed by tower counts have been lagging thus far this season. Yesterday, aerial surveys were flown of Niukluk River to ground truth tower count estimates in light of recent high water events and monitor inriver abundance of coho salmon in the lower reaches the Niukluk and Fish rivers. A total of 970 coho salmon were observed on the Niukluk River from the confluence of the Casadepaga River downstream to the confluence with the Fish River. These aerial observations are somewhat consistent with Niukluk River tower counts considering that salmon passage was not enumerated for 7 days due to high water levels from July 30 to August 5. Coho salmon passage estimates during the high water period have now been calculated for the July 30 to August 2 counts. Projected escapement of coho salmon to the Niukluk River based on the adjusted tower count estimate of 659 coho salmon and normal run timing models now sits at 3,200 coho salmon. While below average, this projection is above the lower end of the tower-based SEG range of 2,400-7,200

-continued-

coho salmon.

This index opening will provide an index of mid-season coho salmon run strength and provide limited commercial harvest opportunity. Subsistence users have spent the last two weeks targeting coho salmon during the hiatus in commercial fishing activity. Subsistence needs should therefore not be jeopardized by these brief mid-season openings. Escapements of coho salmon and commercial catch rates from this index opening will be evaluated before allowing additional commercial opportunity.

Emergency Order: 3-S-Z-51-12 Effective Date: August 14, 2012

EXPLANATION: This emergency order reopens Subdistrict 3, the Elim Subdistrict of the Norton Sound District to commercial salmon fishing for 48 hours from 6:00 p.m. Tuesday, August 14 to 6:00 p.m. Thursday, August 16. This emergency order also limits each permit holder to 100 fathoms of set gillnet gear in aggregate length with a mesh size of 6 inches or less.

JUSTIFICATION: Catch from the recent 24-hour opening in Elim Subdistrict was 340 coho salmon by 15 permit holders. The catch per unit of effort index of 1 index point was half the long-term average of 2 index points. However, while a record low 600 coho salmon has been counted at the Kwiniuk River tower, normal run timing models also result in a projected escapement of 1,821 coho salmon which indicates that the aerial survey SEG range of 650-1,300 coho salmon will be achieved. Over 2,900 coho salmon were counted at the neighboring Tubutulik River from the mouth to Clear Creek, which was high for a partial survey conducted this early in the season. Combined coho salmon abundance from both systems is sufficient to reach escapement goals and provide for customary levels of subsistence harvests of coho salmon in the Elim Subdistrict. Therefore, this period this late in the season is not expected to jeopardize escapement or subsistence needs of coho salmon. This opening will provide limited commercial harvest opportunity. A southerly storm with 30-knot winds is expected to begin Wednesday evening in Norton Sound and the buyer may suspend buying operations early for safety and quality reasons. Permit holders should be in close contact with the buyer to ensure there is a market for their catch. Commercial catch and escapement information will be evaluated before allowing additional commercial opportunity.

Emergency Order: 3-S-Z-52-12 Effective Date: August 17, 2012

EXPLANATION: This emergency order sets the subsistence salmon catch limits in Nome Subdistrict for the reminder of the salmon season.

JUSTIFICATION: Catch limits are still in effect for Nome Subdistrict with the exception of pink salmon. All catch limits are listed on the permit. Catch limits are needed because of the large number of permits compared to the number of fish available for harvest.

Emergency Order: 3-S-Z-53-12 Effective Date: August 20, 2012

EXPLANATION: This emergency order reopens Subdistrict 2 of the Norton Sound District, to commercial salmon fishing for two 48-hour periods from 6:00 p.m. Monday, August 20 to 6:00 p.m. Wednesday, August 22 and from 6:00 p.m. Friday, August 24 to 6:00 p.m. Sunday, August 26. These fishing periods are directed at coho salmon and permit holders will be restricted to gillnets with a mesh size of 6 inches or less.

JUSTIFICATION: Rainfall has again affected a number of salmon counting projects in Norton Sound including the counting tower projects on the Niukluk River used to manage Subdistrict 2. Counting operations suspended during the morning hours of August 17 and the crew is currently unable to count because of high water. However, coho salmon escapement to the Niukluk River improved leading up to this recent high water event. At Niukluk River, projected escapement of coho salmon based on early to normal run timing models is 3,400 to 4,900 coho salmon. Projected coho salmon abundance in the Fish River drainage is now sufficient to warrant additional commercial fishing in Subdistrict 2. These periods can also be extended by emergency order if inclement weather and high surf conditions continue to curtail fishing effort during the scheduled times.

-continued-

These openings will provide commercial harvest opportunity from the tail end of the coho salmon run. Subsistence users have spent the last three weeks targeting coho salmon during the hiatus in commercial fishing activity. Subsistence needs should therefore not be jeopardized by these fishing openings. Escapements of coho salmon and commercial catch rates from these openings will be evaluated before allowing additional commercial opportunity.

Emergency Order: 3-S-Z-54-12 Effective Date: August 21, 2012

EXPLANATION: This emergency order reopens Subdistrict 3 of the Norton Sound District to commercial salmon fishing for two 48-hour periods from 6:00 p.m. Tuesday, August 21 to 6:00 p.m. Thursday, August 23 and from 6:00 p.m. Saturday, August 25 to 6:00 p.m. Monday, August 27. This emergency order also limits each permit holder to 100 fathoms of set gillnet gear in aggregate length with a mesh size of 6 inches or less.

JUSTIFICATION: Rainfall has again affected a number of salmon counting projects in Norton Sound including the counting tower project on the Kwiniuk River used to manage Subdistrict 3. Counting operations were suspended on August 16 and the crew is in the process of evacuating due to flooding into the camp site. However, coho salmon escapements to the Kwiniuk River improved leading up to this recent high water event. The aerial survey SEG range of 650-1,300 coho salmon is expected to be easily achieved based on a projected final tower count estimate of 1,500-1,900 coho salmon. Early season aerial surveys also showed approximately 3,000 coho salmon in the lower reach of the Tubutulik River, the other major salmon producing watershed in Subdistrict 3. A blockage to the slough connecting Moses Point to Kwiniuk Inlet is also possibly affecting the relative distribution of coho salmon in both drainages. Regardless, coho salmon abundance in the Kwiniuk and Tubutulik River drainages is now sufficient to warrant additional commercial fishing in the subdistrict. These periods can also be extended by emergency order if inclement weather and high surf conditions continue to curtail fishing effort during the scheduled times.

Emergency Order: 3-S-Z-55-12 Effective Date: August 28, 2012

EXPLANATION: This emergency order opens Subdistrict 3 of the Norton Sound District to commercial salmon fishing for one 72-hour period from 6:00 p.m. Tuesday, August 28 to 6:00 p.m. Friday, August 31. This emergency order also limits each permit holder to 100 fathoms of set gillnet gear in aggregate length with a mesh size of 6 inches or less. The Subdistrict 3 commercial salmon season will close immediately following this opening.

JUSTIFICATION: Exceptionally high flood levels resulted in the Kwiniuk River tower camp site being flooded and evacuated nearly a month early this season. However, the last projected escapement levels based on early to normal run timing models at both projects indicated that coho salmon aerial survey escapement goal would be achieved. Mid-August aerial surveys also showed approximately 3,000 coho salmon in the lower reach of the Tubutulik River, the other major salmon producing watershed in Subdistrict 3.

This extended period will provide some commercial opportunity at the end of the season. Elim-based commercial permit holders have had substantially limited commercial opportunity this season. This was due to lagging tower counts of coho salmon in early August and severe weather and high surf conditions that prevented commercial fishing for coho salmon by the time escapement projections improved. At this point, the bulk of the coho salmon run is in the Kwiniuk and Tubutulik River drainages and is contributing to escapement needs and subsistence needs. Therefore, these extended periods should not jeopardize subsistence uses of coho salmon. The commercial salmon season will conclude in Subdistrict 3 at the end of this period.

Emergency Order: 3-S-Z-56-12 Effective Date: August 29, 2012

EXPLANATION: This emergency order reopens Subdistrict 2, the Golovin Subdistrict of the Norton Sound District, to commercial salmon fishing for one 72-hour period from 6:00 p.m. Wednesday, August 29 to 6:00 p.m. Saturday, September 1. This period is directed at coho salmon and permit holders will be restricted to gillnets with a mesh size of 6 inches or less. This emergency order also closes the commercial salmon season in Subdistrict 2 at 6:00 p.m. Saturday, September 1.

JUSTIFICATION: Exceptionally high flood levels resulted in the Niukluk River tower camp being inoperable since

-continued-

August 17. However, the last projected escapement levels based on early to normal run timing models at both projects indicated that the lower end of the tower-based SEG range of 2,400-7,200 coho salmon would be easily achieved.

This extended period will provide some commercial opportunity at the end of the season. Golovin-based commercial permit holders have had substantially limited commercial opportunity this season. This was due to lagging tower counts of coho salmon in early August and severe weather and high surf conditions that prevented commercial fishing for coho salmon by the time escapement projections improved. At this point, the bulk of the coho salmon run is in salmon producing drainages in Golovin Subdistrict and is contributing to escapement and subsistence needs. Therefore, this extended period should not jeopardize subsistence uses of coho salmon. The commercial salmon season will conclude in Subdistrict 2 at the end of this period.

Emergency Order: 3-S-Z-57-12 Effective Date: August 28, 2012

EXPLANATION: This emergency order supersedes emergency order 3-S-Z-47-12 by extending the August 26th 48-hour opening for Subdistricts 5 and 6 of the Norton Sound District, the Shaktoolik and Unalakleet Subdistricts, by 24 hours from the original closure time and date of 6:00 p.m. Tuesday, August 28, to the new closure time and date of 6:00 p.m. Wednesday, August 29. This emergency order also extends the August 29th 48-hour opening an additional 24 hours from the original closure time and date of 6:00 p.m. Friday, August 31 to the new closure time and date of 6:00 p.m. Saturday, September 1. This action effectively merges an August 26th 72-hour opener with an August 29th 72-hour opener to create a single 144-hour commercial fishing period. Permit holders in Subdistricts 5 and 6 are limited to 100 fathoms of net in aggregate length with set gillnets that have a stretched-mesh size no greater than 6 inches. Following this period, commercial salmon fishing will resume on a schedule of two 48-hour periods per week until the season closes by regulation at 6:00 p.m. Friday, September 7.

JUSTIFICATION: Continued commercial fishing directed at coho salmon is warranted in southern Norton Sound based on sufficient escapements, improved commercial catch rates and severe weather that has greatly reduced the amount of fishing effort during the month of August. Before the North River tower was flooded out, coho salmon escapement to the North River was projected to easily exceed the upper end of the aerial survey SEG range of 550-1,100 coho salmon. Additionally, Unalakleet River drainage wide estimated escapement is projected to range from 40,000-75,000 coho salmon, which will easily provide for subsistence uses of coho salmon and coho salmon escapement needs in the upper mainstem of the Unalakleet River. Apportioned sonar counts from the Shaktoolik River sonar project operated by NSEDC result in a current escapement estimate of over 10,000 coho salmon. Considering the current weather patterns and forecast, this extended period will provide flexibility for the buyer and fishermen to efficiently target coho salmon surpluses from the tail end of the run.

NORTON SOUND SALMON – SPORT FISH

Emergency Order: 3-KS-xx-12 Effective Date: July 11, 2012

EXPLANATION: 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 6:00 p.m. Wednesday, July 11, 2012.

-end-

APPENDIX H: ARCTIC FISHERIES

Appendix H1.–Commercial freshwater finfish harvest and sales, Colville River, Arctic Area, 1964–2010.

	Number of Fish Harvested Intended for Commercial Sale [a]					Estimated Commercial Sales Based on Fish Tickets [b]	
Year	Broad Whitefish	Humpback Whitefish	Least Cisco ("herring")	Arctic Cisco ("kaktok")	Total Harvest	Arctic Cisco	Whitefish Species [c]
1964	2,951 [d]	–	9,000	16,000	27,951	–	–
1965	3,000 [d]	–	–	50,000	53,000	–	–
1966	2,500 [d]	–	–	40,000	42,500	–	–
1967	–	–	–	–	0	–	–
1968	3,130	–	18,180	42,055	63,365	–	–
1969	–	–	–	–	0	–	–
1970	2,080 [d]	–	25,930	19,602	47,612	–	–
1971	3,815	132	22,713	38,016	64,676	–	–
1972	3,850	1,497	13,283	37,333	55,963	–	–
1973	2,161	–	25,188	71,569	98,918	–	–
1974	3,117	2,316	13,813	35,601	54,847	–	–
1975	2,201	1,946	20,778	28,291	53,216	–	–
1976	2,172	1,815	34,620	31,659	70,266	–	–
1977	443	1,431	14,961	31,796	48,631	–	–
1978 [e]	20	1,102	21,589	17,292	40,003	–	–
1979	0	1,831	24,984	8,684	35,499	–	–
1980	0	4,231	31,459	14,657	50,347	–	–
1981	1,035	469	16,584	38,206	56,294	–	–
1982	1,662	201	25,746	15,067	42,676	–	–
1983	0	408	35,322	18,162	53,892	–	–
1984	789	179	13,076	27,686	41,730	–	–
1985	401	191	17,595	23,679	41,866	–	–
1986	0	18	9,444	29,895	39,357	–	–
1987	5	1,989	10,922	24,769	37,685	–	–
1988	429	6,733	23,910	10,287	41,359	–	–
1989	71	6,575	23,303	17,877	47,826	–	–
1990	0	5,694	21,003	19,374	46,071	12,571 [f]	14,249 [f]
1991	0	1,240	5,697	13,805	20,742	1,970 [g]	3,307 [g]
1992	126	5,209	6,962	20,939	33,236	–	10,200 [h]
1993	20	5,339	6,037	31,310	42,706	11,291 [g]	6,170 [g]
1994	–	6,056 [i]	10,176	8,958	25,190	7,434 [g]	4,121 [g]
1995	–	33,794 [j]	–	–	33,794	13,921	6,000
1996	–	6,425 [i]	7,796	21,817	36,038	9,076	4,127
1997	–	1,721 [i]	10,754	9,403	21,878	9,403	4,760
1998	–	4,881 [i]	9,936	7,019	21,836	5,648	7,105
1999	–	6,875 [i]	7,430	8,832	23,137	7,095	6,170

-continued-

Year	Number of Fish Harvested Intended for Commercial Sale [a]					Estimated Commercial Sales Based on Fish Tickets [b]	
	Broad Whitefish	Humpback Whitefish	Least Cisco ("herring")	Arctic Cisco ("kaktok")	Total Harvest	Arctic Cisco	Whitefish Species [c]
2000	–	3,706 [i]	5,758	2,619	12,083	2,809	6,569
2001	–	6,078 [i]	2,839	1,740	10,657	1,779	7,306
2002	–	4,183 [i]	5,503	3,935	13,621	899	4,093
2003	–	6,463 [i]	4,777	5,627	16,867	0	1,292
2004	–	1,145 [i]	3,061	3,061	7,267	2,412 [h]	476
2005	–	490 [i]	2,870	9,343	12,703	2,975 [h]	2,170
2006	–	1,188 [i]	4,995	3,293	9,476	1,482 [h]	3,655
2007	–	462 [i]	2,265	390	3,117	– [k]	– [i]
2008	–	–	–	–	–	–	–
2009	–	–	–	–	–	–	–
2010	–	–	–	–	–	–	–
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] Fish tickets were often not generated at the time of sale. Since 1990, the commercial harvest is based on fish ticket information. Dashes indicate information is not available.

[c] Whitefish species include mostly humpback whitefish and least cisco, with occasional broad whitefish.

[d] Includes small numbers of Humpback whitefish.

[e] Reported the harvest of 1 Chinook, 2 sockeye, 9 chum, and 118 pink salmon.

[f] 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).

[g] 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).

[h] Mixed commercial harvest of mostly Arctic cisco along with humpback and 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.

[i] Humpback whitefish harvest includes undetermined amounts of broad whitefish.

[j] Humpback whitefish harvest includes undetermined amounts of broad whitefish, least cisco, and Arctic cisco.

[k] No information is available from fish tickets indicating that harvested fish were sold commercially.