Fishery Management Report No. 08-39

2007 Annual Management Report
Norton Sound, Port Clarence, and Kotzebue

by

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and

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June 2008

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)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

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

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The Division of Sport Fish Fishery Management Reports series was established in 1989 for the publication of an overview of Division of Sport Fish management activities and goals in a specific geographic area. Since 2004, the Division of Commercial Fisheries has also used the Fishery Management Report series. 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.sf.ADF&G.state.ak.us/statewide/divreports/html/intersearch.cfm. This publication has undergone regional peer review.

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PREFACE

This report summarizes the 2007 season and historical information concerning management of the commercial and subsistence fisheries of Norton Sound, Port Clarence and Kotzebue Sound Districts 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 supersedes information found in previous management reports. An attempt has been made to correct errors presented in earlier reports. Previously unreported data was included and is indicated by appropriate footnotes. Current year catch data presented was 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 has been separated into two categories to facilitate use of this report: 1) Tables 1–16 present annual data, and 2) appendices generally present historical comparisons. Not all tables, figures, and appendices are cited in the text, and are not necessarily cited in order.

ABSTRACT

This report provides information for the 2007 commercial and subsistence fisheries of Norton Sound, Port Clarence, and Kotzebue management areas of the Arctic-Yukon-Kuskokwim Region of the Alaska Department of Fish and Game Division of Commercial Fisheries. The Norton Sound, Port Clarence, and Kotzebue management area consists of all waters from Point Romanof north of the Yukon River to Point Hope. 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 pallasi*, red king crab *Paralithodes camtschaticus*, and miscellaneous species such as inconnu (sheefish) *Stenodus leucichthys*, whitefish *Coregonus laurettae*, Dolly Varden *Salvelinus malma*, and saffron cod *Eleginus gracilis.*

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

SECTION 1: MANAGEMENT AREA OVERVIEWS

BOUNDARIES

Norton Sound, Port Clarence and Kotzebue Sound salmon management districts include all waters from Point Romanof in southern Norton Sound to Point Hope, and St. Lawrence Island (Figure 1). These management districts are over 65,000 mi ², and have a coastline exceeding that of California, Oregon, and Washington combined.

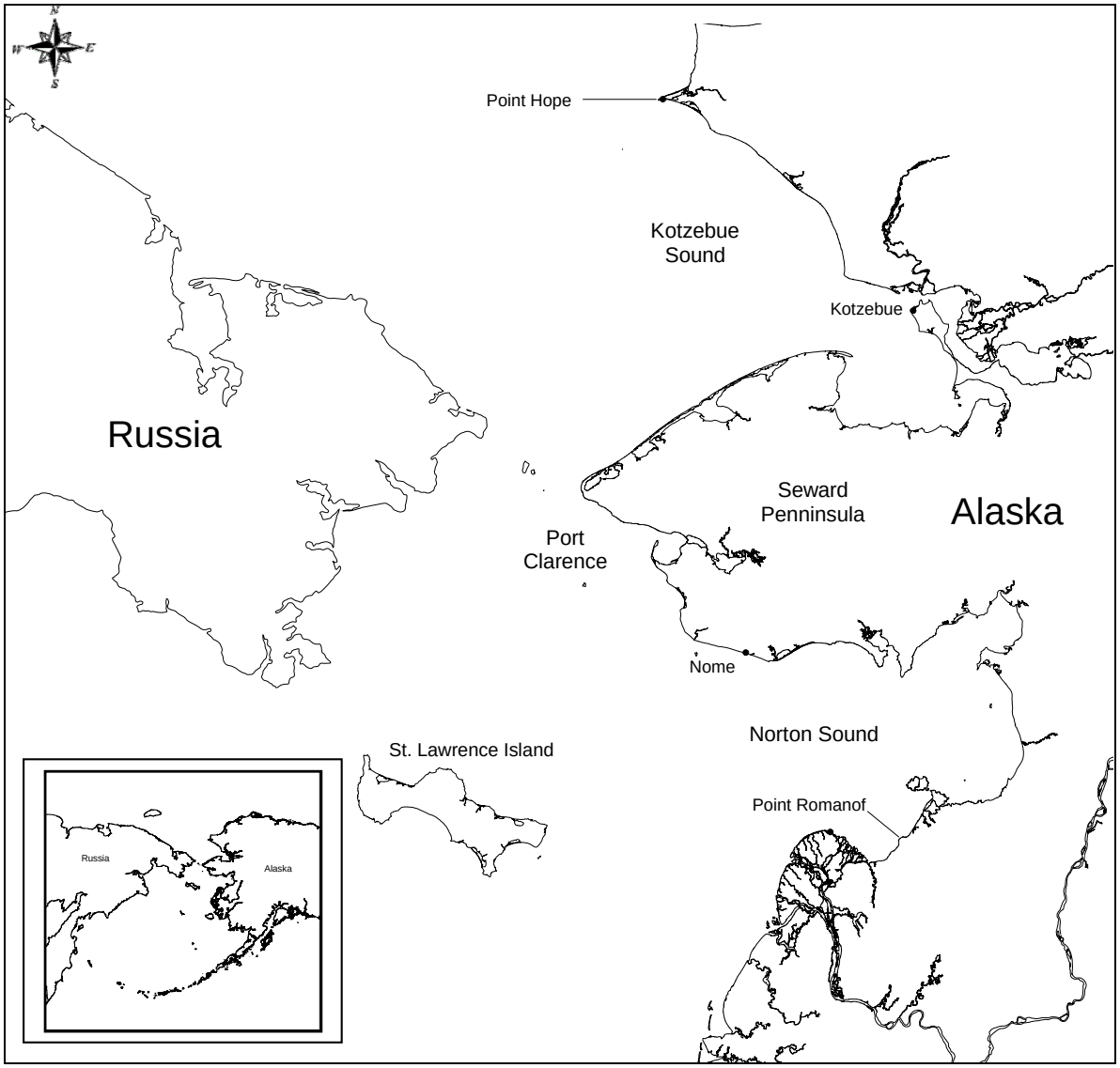

Figure 1.–Norton Sound, Port Clarence, and Kotzebue Sound management districts.

SALMON OVERVIEW

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

COMMERCIAL 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 the Norton Sound and Kotzebue areas. 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 fishers and many buying station workers are resident Native Alaskans (Yupik, Inupiat, and Siberian Yupik). Commercial fishers operate set gillnets from outboard powered skiffs and all commercial caught salmon are harvested in coastal marine waters.

SUBSISTENCE SALMON FISHERY

There are approximately 17,000 people in the area, the majority of whom are Native Alaskans residing in more than 30 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 fishers operate gillnets or seines in the main rivers, and to a lesser extent in coastal marine waters, capturing primarily salmon, whitefish, Dolly Varden, and inconnu (sheefish). Beach seines are used 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 is 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 back in 2005 when the Division of Subsistence, due to budget constraints, discontinued household surveys for Kotzebue Sound District. In addition, expansion of the Tier I 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.

Two visits by ADF&G personnel are made to each village to issue Tier I subsistence 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, Shaktoolik, Unalakleet, Stebbins, and St. Michael postseason household surveys are conducted. Researchers attempt to contact all households. Department staff uses a community household list, and each year update any new households and delete those no longer there. Salmon survey data is expanded to include those households that usually fish, but ADF&G was unable to contact.

SALMON MANAGEMENT

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 2007 consisted of an Area Management Biologist, an Assistant Area Management Biologist, and the Fish and Game Program Technician stationed in the Nome office. In addition, seasonal assistance in conducting various management and research activities was provided by approximately 20 seasonal biologists and technicians in Norton Sound and Kotzebue Sound. Biologists from regional staff provided additional assistance. In 2007, interns funded by Norton Sound Economic Development Corporation (NSEDC) were utilized as fisheries technicians at some projects. Four cooperative projects staffed by Kawerak Inc., one project jointly operated by NSEDC and ADF&G, and one project jointly operated by the Unalakleet IRA 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, Kawerak Inc., NSEDC, and Unalakleet IRA 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 problems 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 uses to receive priority over other uses 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 fishing regulations provide for up to 4 days of fishing per week during the open season depending on area and season differences. ADF&G attempts to distribute fishing effort throughout the entire return to avoid harvesting only particular segments of the return. Occasionally, fishing time is increased or decreased by emergency order. Managers issue these orders depending upon fishing conditions and strength of runs or spawning escapements, as determined by evaluation of available run timing and abundance indicators. Weekly fishery reports with fishery status and schedules are broadcast during the fishing season over radio stations KICY and KNOM in Nome, and KOTZ in Kotzebue. Also, 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: Subdistrict 1, Nome (333-10); Subdistrict 2, Golovin (333-20); Subdistrict 3, Moses Point (333-31, 32, 33); Subdistrict 4, Norton Bay (333-40); Subdistrict 5, Shaktoolik (333-50); and Subdistrict 6, Unalakleet (333-60). The subdistrict and statistical area boundaries were established to facilitate management of individual salmon stocks, and each subdistrict contains at least 1 major salmon-producing stream (Figure 2).

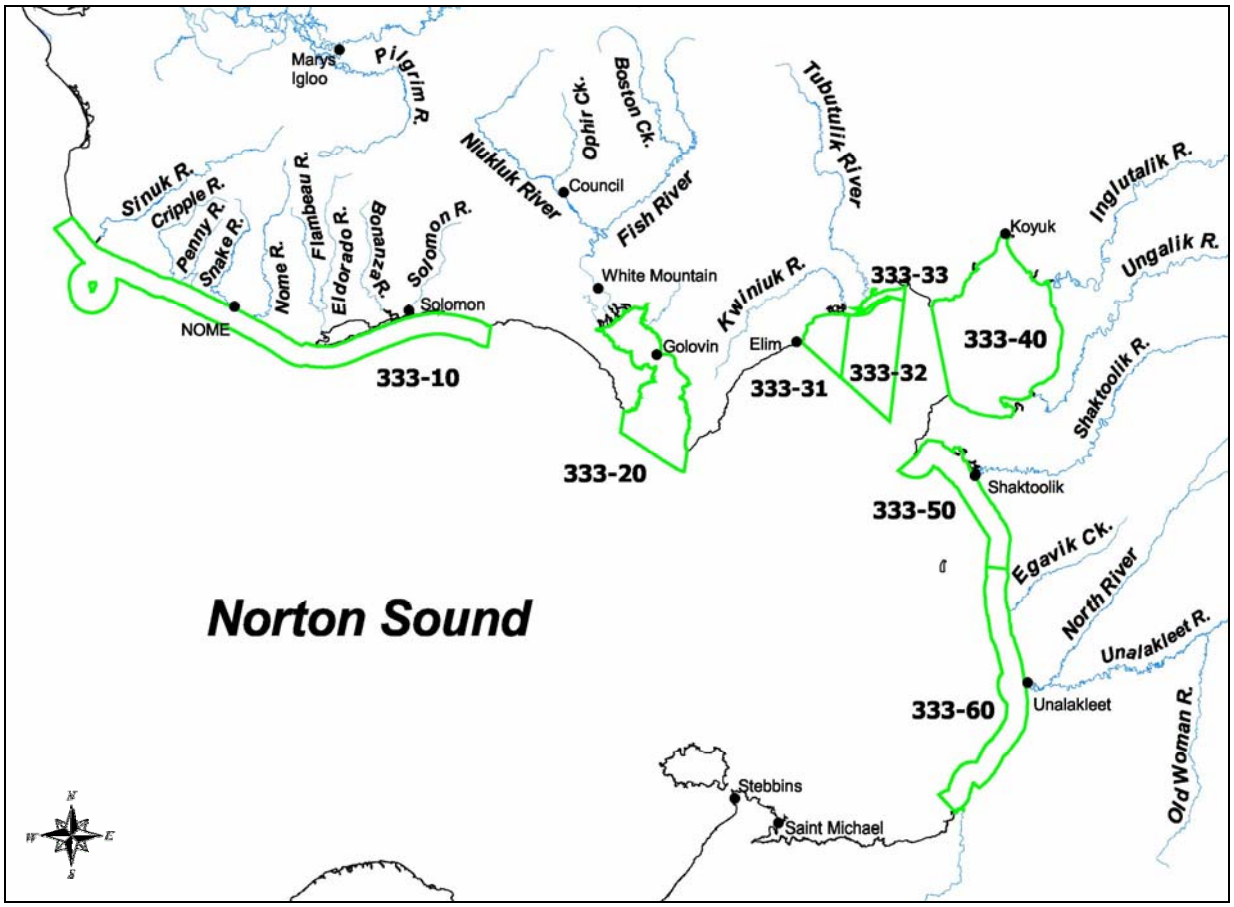

Figure 2.–Norton Sound commercial salmon fishing subdistricts and statistical areas.

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 has changed significantly since the mid 1990s because of limited market conditions and marginal returns of many salmon stocks within the district. There had been no commercial interest in pink salmon since 2000, but in 2007, there was some commercial fishing to harvest a small portion of the pink salmon run. Except for Nome Subdistrict, commercial fishing can only occur if salmon runs are sufficient and a commercial market opens. Commercial fishing managers use estimates of run strength from escapement counting projects, test fishing, aerial surveys, and commercial fishing 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, 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 pound from the fishers. 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, Saint Michael, Unalakleet, and Golovin. An example of quantity was the 8x20x40 foot cache at the Shaktoolik store filled to the top with dry fish. One elder said the stores would buy the fish for $0.06 a pound and sell them for $0.10 a pound or their equivalent in groceries and supplies (Thomas 1982). By the early 1960s, commercial salmon fishing developed into a source of summer cash and snow machines were replacing the need for dog teams. The use of dry fish to feed dogs decreased and cash became more available for exchange at stores.

COMMERCIAL FISHERY OVERVIEW

Commercial salmon fishing in Norton Sound District began in Shaktoolik and Unalakleet Subdistricts in 1961. Most early interest involved Chinook and coho salmon flown in dressed condition to Anchorage for further processing. A single U.S. freezer ship purchased and processed chum and pink salmon during 1961. In 1962, two floating cannery ships operated in the district and commercial fishing was extended into Norton Bay, Moses Point, and Golovnin Bay. The peak in salmon canning operations occurred in 1963.

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

The commercial salmon fishing season usually opens by emergency order between June 8 and July 1, but depends on run timing within each subdistrict. The season closes by regulation on August 31 in Subdistricts 1, 2, and 3, and on September 7 in Subdistricts 4, 5, and 6, but processors often terminate their operations before regulatory closure dates. Commercial fishing periods are set by emergency order. No commercial salmon periods have occurred in the Nome Subdistrict since 1996 because of low fish runs or, in the case of pink salmon, no market.

Commercial fishing gear is restricted to set gillnets. A maximum aggregate length of 100 fathoms is allowed for each fisher. No mesh size or depth restrictions are enforced during normally scheduled periods. However, mesh size is often restricted in an attempt to harvest a specific species of salmon. Most gillnets fished are approximately 5 7/8 inch stretched measure. In Unalakleet and Shaktoolik Subdistricts, 8 1/4 inch stretched mesh gillnets are commonly used 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 1/2 inch mesh or less to be used. These special small mesh periods are an attempt to target pink salmon without over harvesting larger sized salmon species.

Most fishers do not tend their nets continuously once they are set, leaving them unattended overnight. Fish quality suffers coincidental to length of time fish may be left in the nets and is especially poor when storms prevent fishers from checking their gear for extended periods.

COMMERCIAL FISHERY MANAGEMENT

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

Aerial surveys are used to monitor escapements in most Norton Sound streams. Weather conditions, time of day, type of aircraft, water conditions, bottom conditions, date of survey, and efficiency of surveyor and pilot must be taken into account when making inter-annual aerial survey comparisons. Counting towers and weirs are a more consistent and accurate method of obtaining migration information and have been utilized on several river systems in Norton Sound. Four counting towers and 5 weirs operated in 2007.

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. Southern Norton Sound Subdistricts 5 and 6 (Shaktoolik and Unalakleet) have maintained commercial fisheries that target chum and coho salmon. Coho salmon catches have remained fairly stable while chum salmon catches have been rebounding in recent years; however, there has been limited market interest in chum salmon. Management has consisted of a series of emergency orders that open and close fishing seasons and periods, adjust fishing time, and restrict mesh size.

Commercial fisheries in Subdistricts 2 and 3 (Golovin and Moses Point) targeted chum salmon and during even numbered years, pink salmon. Commercial chum salmon harvests have dropped dramatically since the mid 1980s. Poor chum salmon runs have resulted in restrictive management actions during the late 1990s and 2000s, but in recent years there has been little market interest.

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

SUBSISTENCE FISHERY OVERVIEW

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 Commercial Fisheries Division 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. For the last 10 years that this subsistence data is available for Norton Sound District (1996–2005) the average subsistence catch was 81,373 salmon including all species, although the majority of salmon taken were pink salmon (Appendix A13).

Goals of the postseason household subsistence survey:

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

In 2004, ADF&G's subsistence salmon harvest assessment program changed substantially when household surveys were discontinued in most communities because the Tier I household subsistence permit system was expanded from Nome to include Port Clarence District (affecting

communities of Teller and Brevig Mission) and Norton Sound Subdistricts 2 and 3 (affecting communities of Council, White Mountain, Golovin, and Moses Point/Elim). Thereafter, subsistence salmon harvest for those communities are reported totals from subsistence permits, so household surveys have not been necessary.

In Norton Sound Subdistrict 1, Nome, low salmon stock levels combined with a large concentration of users has required subsistence harvest permits since 1974. 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 this Tier I subsistence permit program, all subsistence salmon catches from Norton Sound Subdistrict 1 have been determined from permit reported totals since 1974. However, not all fishers obtained or returned permits in the past, and the data was not expanded, therefore harvest data before 2004 should be considered minimum figures.

Norton Sound Subdistricts 5 and 6, Shaktoolik and Unalakleet, have continued to be surveyed postseason, by household. Additionally, daily surveys of Unalakleet River and ocean subsistence fishers have been conducted annually during the Chinook salmon run since 1985. Although total harvests by subsistence fishers were not documented, effort and catch information were used to judge timing and magnitude of the Chinook salmon return. The commercial fishery is delayed until it becomes apparent subsistence needs are being met and Chinook salmon are beginning their upstream migration as indicated by ADF&G test net in the lower Unalakleet River. Since the early 1990s, some subsistence nets are fished in the ocean to avoid large debris loads from spring runoff.

HISTORICAL REGULATORY ACTIONS IN NORTON SOUND SUBDISTRICTS 1, 2 AND 3

Subdistrict 1 has been the focus of most regulatory actions within the Norton Sound District since the 1970s. Although pink salmon are usually the most abundant species of salmon in Subdistrict 1 streams, the commercial fishery primarily targeted chum salmon during the 1970s. Relatively large chum salmon catches in this subdistrict in conjunction with weak local abundance implied the fishery intercepted non-local stocks. A 1978–1979 Norton Sound stock separation study confirmed this view. 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 Subdistrict 1 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 board proposals, the following commercial fishery restrictions were adopted as regulations:

1) Salmon may be taken commercially only from July 1 through August 31.
2) Fishing periods were restricted to two 24-hour periods per week.
3) Waters west of Cape Nome were closed to commercial salmon fishing to allow for rebuilding of the river stocks that supported the historical subsistence effort.

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 the sport fishery in the Nome and Snake Rivers was adopted in 1984:

> 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 the Nome, Eldorado, Flambeau, Bonanza, Snake, and Solomon Rivers. In response to this continuing trend of decreasing chum and pink salmon returns to Nome Subdistrict, several new regulations were adopted by BOF in 1987 restricting gillnet length and mesh size.

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 restricted beach seines 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.

Nome Subdistrict was designated a Tier II subsistence chum salmon permit fishery during a special meeting by BOF held in Nome, March 1999. Tier II permits are dispensed to individuals by fishing history, dependence, and projected harvestable surplus. 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. As a result, ADF&G allowed twenty individuals who scored high 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, three Norton Sound District chum salmon stocks were determined to be stocks of concern based on the Policy for the Management of Sustainable Salmon Fisheries. Nome Subdistrict chum salmon were determined to be a stock of management concern and Golovin and Moses Point Subdistricts chum salmon were determined to be a stock of yield concern.

BOF made several changes to regulations for management of Norton Sound salmon. In January 2001, 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 western boundary of Subdistrict 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, a fishing pole became legal subsistence gear. Although a fishing pole can be used for subsistence fishing, sport fish methods and means requirements still apply to harvesting of fish, for example no snagging of fish. Sport fish bag and possession limits, by species, as specified in regulation 5 AAC 70.022 also apply, except when fishing through ice or when a subsistence salmon permit is required, in which case harvest limits specified in the subsistence permit will apply. However, fishers cannot combine sport fish bag and possession limits with subsistence harvest permit limits.

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). Four of 5 OEGs were established for rivers where an escapement project (tower or weir project) is operated. BOF established OEGs, by subdistrict:

Subdistrict 1

Snake River: 1,600–2,500 chum salmon
Nome River: 2,900–4,300 chum salmon
Eldorado River: 6,000–9,200 chum salmon

Subdistrict 3

Kwiniuk River: 11,500–23,000 chum salmon
Tubutulik River: 9,200–18,400 chum salmon

BOF adopted a chum salmon management plan for Subdistrict 1 and a salmon management plan for Subdistricts 2 and 3. Commercial chum salmon fishing in Nome Subdistrict was closed and the fishery may not be reopened again until the abundance of chum salmon has a harvestable surplus large enough to meet subsistence needs for 4 consecutive years.

ADF&G was given authority to establish subsistence gillnet mesh size restriction of 4½ inch or less by emergency order when necessary to conserve chum salmon in Subdistricts 1, 2, and 3. BOF closed Cripple and Penny Rivers to subsistence fishing for chum salmon.

In 2001, the 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 Tier I salmon subsistence permit requirement for the Nome 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.

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 drainage (Figure 3). Salmon, saffron cod, whitefish, and herring are the major subsistence species.

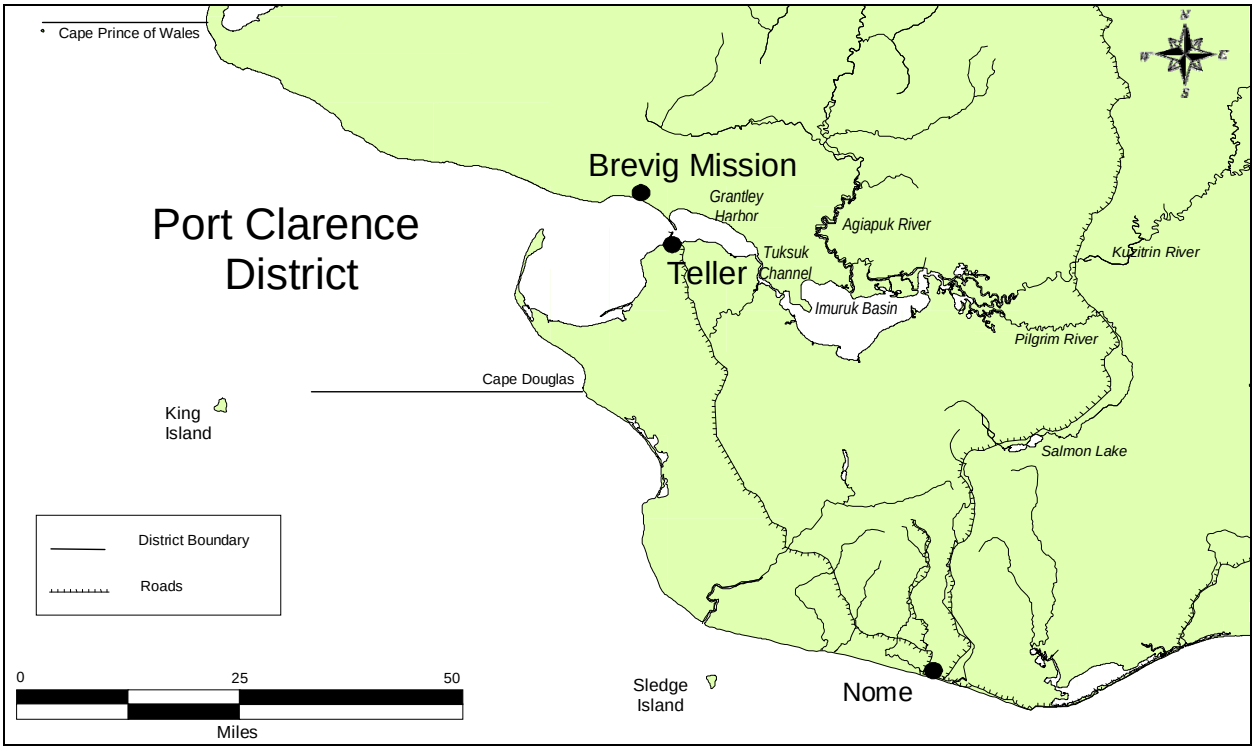

Figure 3.–Port Clarence commercial salmon district.

COMMERCIAL FISHERY OVERVIEW

Few subsistence caught salmon are sold or bartered each year in Teller and Nome, but the last commercial fishery took place in 1966, when a total of 1,146 salmon consisting of 93 sockeye salmon, 131 pink salmon, and 922 chum salmon were taken in Grantley Harbor/Tuksuk Channel area. Since then, commercial salmon fishing in this district has 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 recent years and positive results from an ADF&G test fishery in 2006 led to the opening of a limited commercial fishery in 2007.

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 fishers of Brevig Mission fish northern and northeastern sections of Port Clarence, and Teller fishers utilize Grantley Harbor and Tuksuk Channel. Interviews with local residents indicated substantial fishing effort within Agiapuk River.

Village subsistence surveys had been conducted annually by Division of Commercial Fisheries up until 1983 (Appendix B2). The Division of Subsistence conducted a partial survey of Brevig Mission in 1989, and ADF&G conducted full-scale household surveys of both villages from 1994–2003. Since the expansion of the Tier I subsistence salmon permit and catch calendar program in 2004, subsistence salmon harvests for residents of Teller and Brevig Mission have been determined from reported totals on permits and catch calendars.

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. BOF adopted a regulation in 1972 to close Salmon Lake and its tributaries to subsistence salmon fishing from July 15 through August 31 to conserve declining sockeye salmon stocks. 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 (Figure 4).

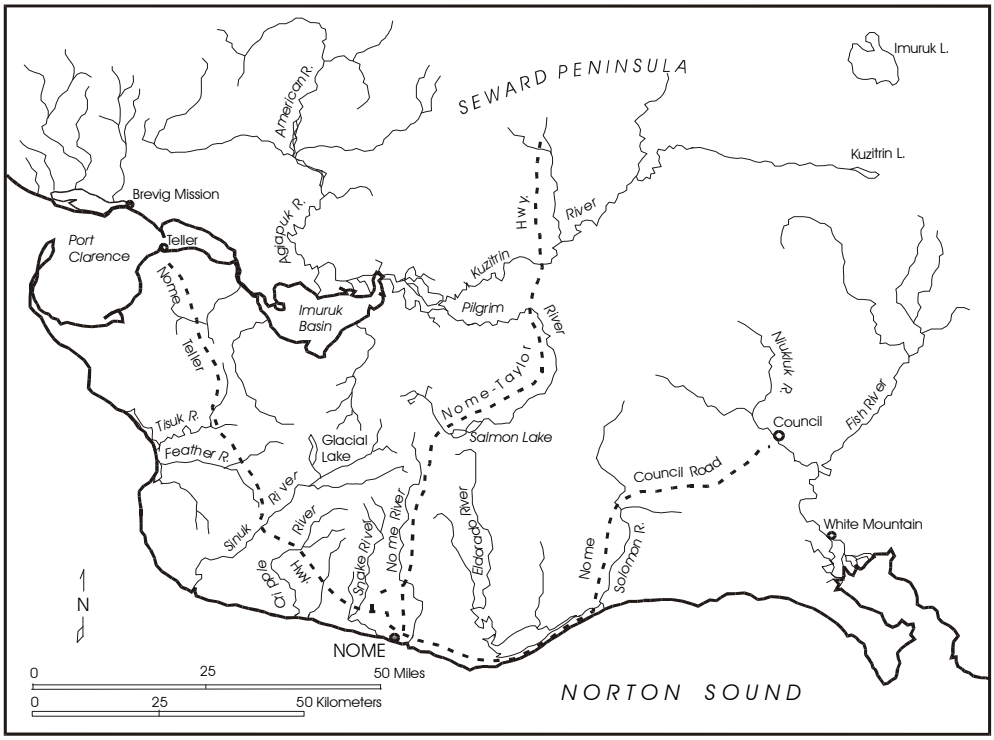

Figure 4.–Seward Peninsula with road accessible waters.

From 1997 to 2001, ADF&G conducted a fertilization program at Salmon Lake, partially funded by NSEDC and 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, and reapplied in 2007.

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 the major subsistence species.

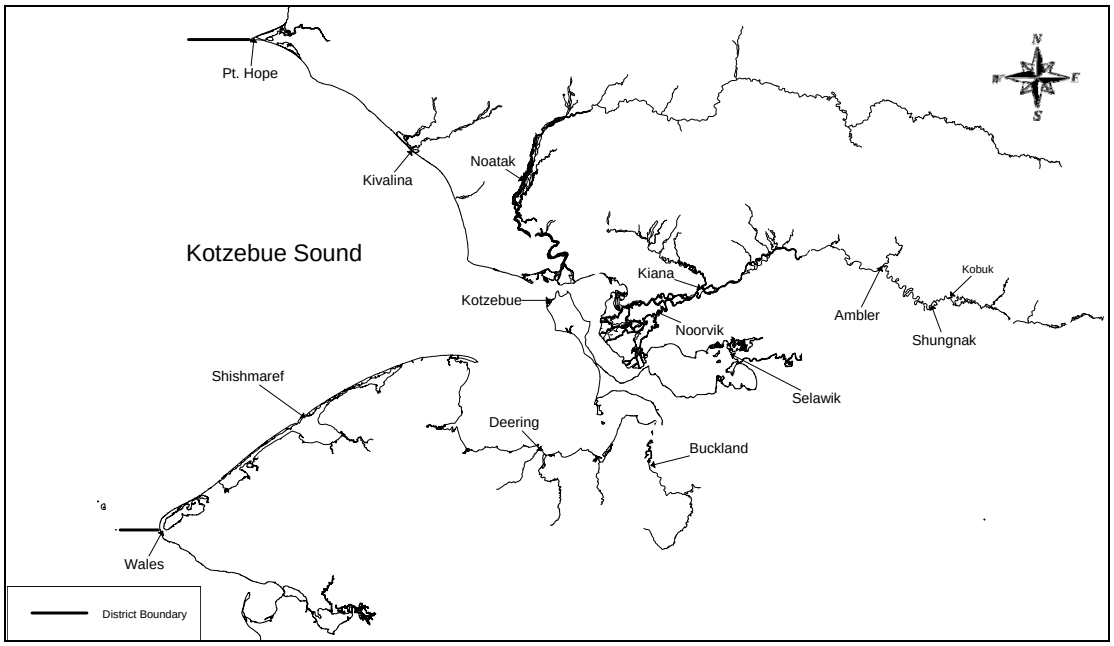

Figure 5.–Kotzebue Sound District, villages and subsistence fishing area.

COMMERCIAL FISHERY OVERVIEW

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

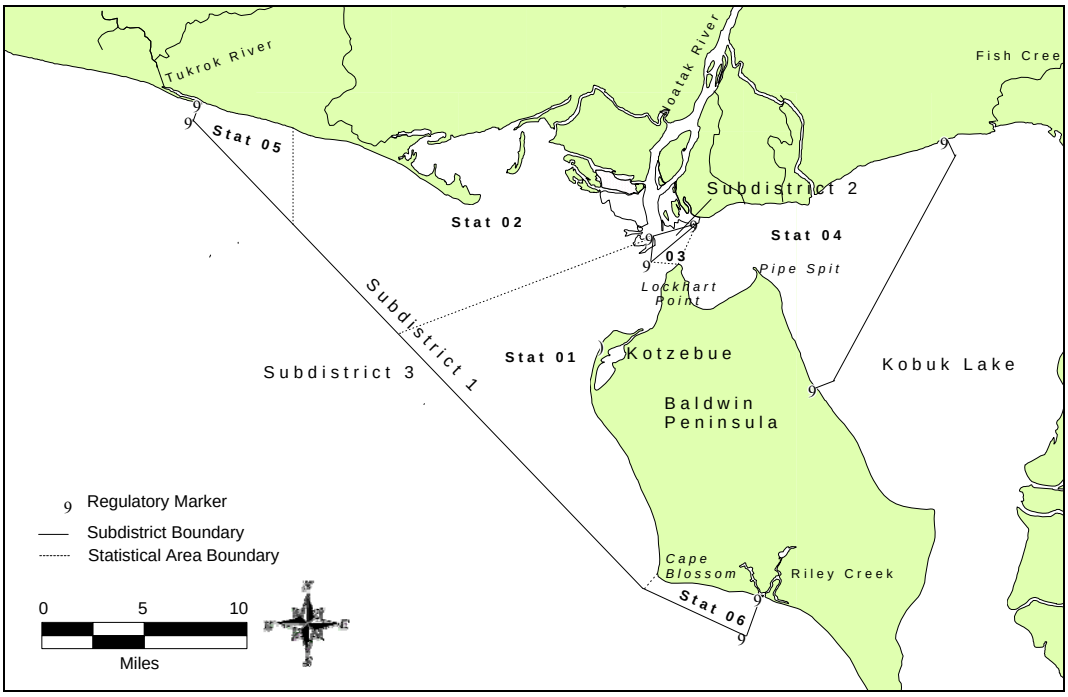

Figure 6.–Kotzebue Sound commercial salmon fishing subdistricts and statistical areas.

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 salmon are harvested during the salmon fishery.

The earliest documented sales of salmon in the Kotzebue District were in 1909 when Lockhart's store purchased 21,906 pounds of salmon from local Native Alaskans and resold it at $0.05/lb. Of those sales, 21,366 pounds were sold to gold miners on the Kobuk River drainage and 540 pounds were sold to a company in Seattle. A commercial fishery occurred from 1914 to 1918. Salmon were canned and the bulk of the harvest 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 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. Also, some fishers base their fishing effort out of their village, while others move seasonally to fish camps where they stay for several days to several weeks. Chum salmon is the predominate species in the district, 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. Expanded documented surveys from 1994–2004 estimates total subsistence salmon harvest for Kotzebue Sound area to be 56,260 annually (Appendix C5). During these years, ADF&G Division of Subsistence conducted annual household subsistence 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.

PACIFIC HERRING OVERVIEW

DISTRICT BOUNDARIES

Pacific Herring are present in all 3 Pacific Herring Districts. Norton Sound Herring District consists of all Alaska waters between the latitude of the western-most tip of Cape Douglas and the latitude of Point Romanof (Figure 7). Port Clarence Pacific Herring District consists of all

Alaska waters between the latitude of Cape Douglas and the latitude of Cape Prince of Wales. Kotzebue Sound Pacific Herring District consists of all Alaska waters between the latitude of Cape Prince of Wales and the latitude of Point Hope.

SPAWNING AREAS AND TIMING

Arrival of Pacific herring *Clupea pallasi* on the spawning grounds is greatly influenced by climate and oceanic conditions, particularly the extent of the Bering Sea ice pack. Most herring spawning populations appear near the eastern Bering Sea coast immediately after ice breakup between mid May and mid June. Spawning progresses in a northerly direction and may continue into July or August along portions of the Seward Peninsula or within the Chukchi Sea.

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.

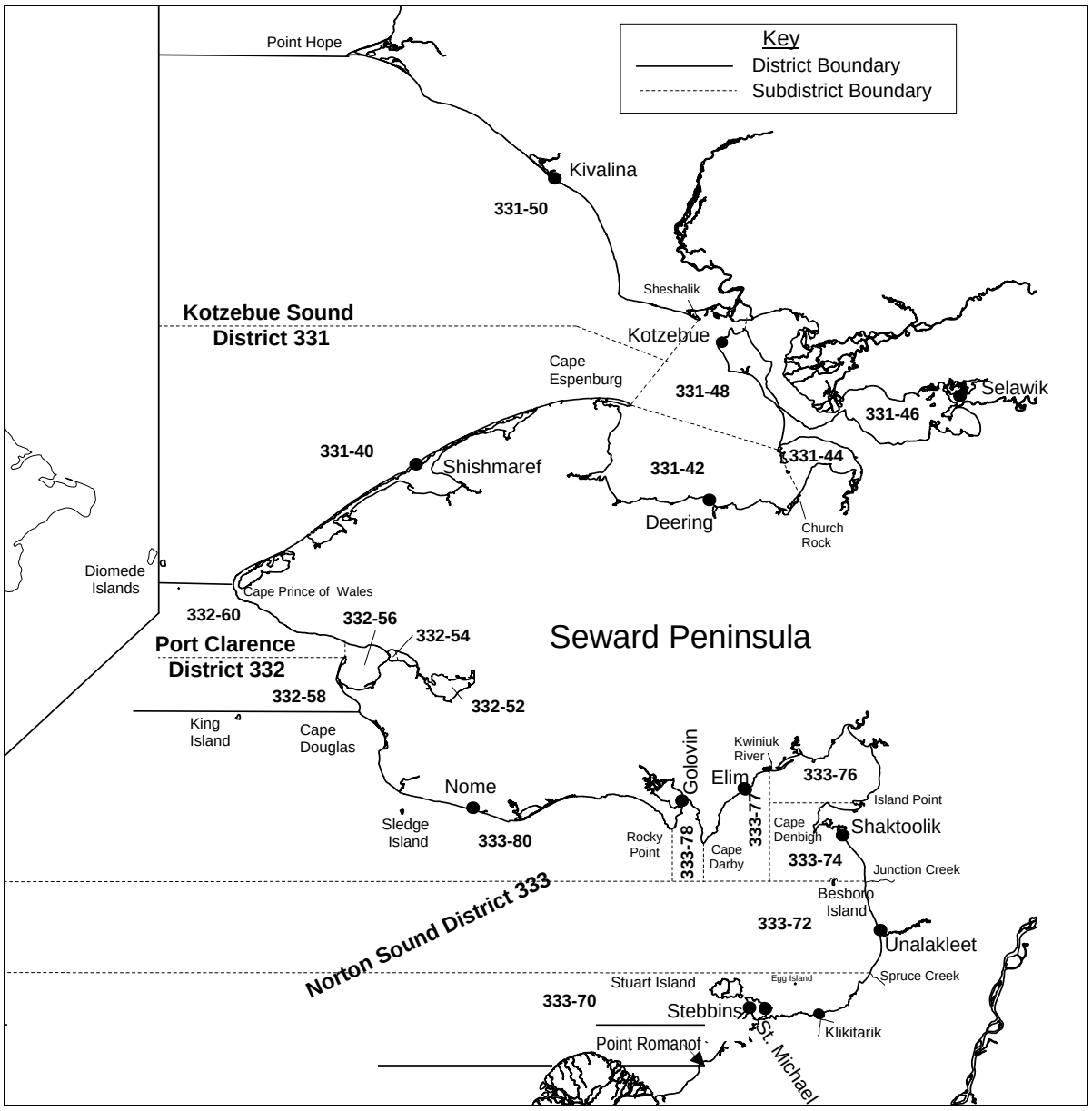

Figure 7.–Commercial herring districts and statistical areas of Norton Sound, Port Clarence, and Kotzebue Sound.

NORTON SOUND PACIFIC HERRING OVERVIEW

COMMERCIAL FISHERY OVERVIEW

Sac Roe

Domestic commercial fishing resumed for "spring herring" in Norton Sound in 1964 near Unalakleet and continued sporadically until 1979. Between 1964 and 1978, the fishery averaged about 10 tons of herring annually for sac roe extraction (Appendix D1). In 1979, a domestic herring fishery for sac roe began on a larger scale in Norton Sound when approximately 1,292

tons of herring were taken by 63 fishers (13 purse seiners, 50 gillnetters). Purse seiners took 70% of the total catch.

After the 1979 season, 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 fishers in this developing fishery.

During the 1980 season, 294 gillnet fishers harvested 2,452 tons of herring (Appendix D3 and D4). Because gillnet fishers demonstrated they were capable of taking the available harvest, a regulation was passed in 1981 to prohibit any purse seine gear within Norton Sound District.

Before the 1984 season, harvest by beach seine fishers was negligible, but in 1984, 10 beach seine fishers 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 projection as published by the Department." During the fall 1987 BOF meetings, beach seine gear was further restricted to a limit of 75 fathoms. Beach seine harvests from 1985–2000 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 size herring captured.

As with most developing fisheries, fishing effort and harvest increased with each season. In 1984, Norton Sound became a super exclusive herring fishing district to slow growth and bolster local involvement, but it had limited success. The 1987 herring roe gillnet season harvested approximately 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 Fishing 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 1988–1989 Norton Sound sac roe fisheries were about average, with approximately 4,400 tons harvested each year by gillnet, and approximately 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, but the 1993 beach seine harvest of approximately 742 tons was the largest harvest on record, 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 0 tons 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.

The Limited Entry Commission currently reviews and awards limited entry permits to fishers based on fishing history and economic dependence on the fishery. However, recently there has been little interest in this fishery.

Spawn on Kelp

A small-scale spawn-on-kelp *Fucus sp.* fishery existed in Norton Sound from 1977 to 1984. Harvests during the 1977–1984 period ranged from less than 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. 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. BOF approved an experimental herring spawn on *Macrocystis* kelp fishery to operate in Norton Sound during the 1998 season. The Commissioner approved emergency regulations to allow a herring spawn on wild *Fucus* kelp fishery shortly before the normal start of the sac roe fishery. The intent of these decisions was to allow as much opportunity as possible to sac roe permit holders, 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. The herring spawn-on-kelp guideline harvest level may not be more than 90 tons, to include combined weight of herring eggs and kelp. ADF&G shall manage the herring pound spawn-on-kelp fishery to achieve this level by restricting the number of blades of kelp that may be suspended from a herring pound: (1) no more than a total of 75,000 blades of kelp are allowed in the fishery; and (2) the maximum number of blades of kelp any permit holder may attach to a herring pound is 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 2002, 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 / 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 440 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/bait herring fishery in Norton Sound. The majority of food/bait herring harvest estimates were initially harvested as sac roe, but bought and processed as food/bait, thus considered food/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/bait. Since 1997, no more than 64 tons of herring were sold as food/bait (Appendix D1).

COMMERCIAL FISHERY MANAGEMENT

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

Typically, herring are long-lived fish and will usually remain harvestable for at least 5 years after recruiting into the fishery. Harvesting only a percentage of the biomass ensures some fish will remain for following years. This type of strategy helps mitigate population fluctuations caused by successive years of poor recruitment, a common occurrence in marine spawning fish. Before 1983, harvests in Norton Sound were regulated by subdistrict so harvests would be dispersed over the entire fishing grounds. This strategy prevented 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 quota. Since 2002, to maximize efficiency for fishers 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 in recent years no buyer interest has existed for herring harvested from beach seines.

HISTORICAL AND 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. The earliest American commercial effort on Bering Sea herring apparently took place in the early part of the 1900s at Golovnin Bay in Norton Sound (Appendix D1).

PORT CLARENCE AND KOTZEBUE PACIFIC HERRING OVERVIEW

COMMERCIAL FISHERY OVERVIEW

Sac Roe

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. Before 1987, no spring sac roe commercial fisheries had ever occurred within these districts. In 1988, there was a herring roe gillnet fishery harvest of approximately 19 tons, but no beach or purse seine harvests. Then, in 1994 and 1995 there were gillnet harvests of approximately 2 tons and 7 tons. Interest in exploring these stocks has been expressed in past years by industry personnel operating in Norton Sound District, however no large-scale effort to develop a fishery has occurred because of late ice breakup and fishery timing in Port Clarence and Kotzebue Districts. In Kotzebue, no purse seine permits have been fished since 1988, and no beach seine or gillnet permits since 1996. Both Port Clarence and Kotzebue fishers have been unable to attract a sac roe buyer for their relatively late fishery due to poor market conditions.

Spawn on Kelp

Port Clarence and Kotzebue commercial herring fisheries have been in regulation since 1982. The 1983 and 1984 regulations set a guideline harvest of 150 metric tons (165 tons) for each district, which is still in effect. Presently, purse seines, beach seines, and gillnets are legal commercial gear within these districts, and regulations allow spawn-on-kelp fisheries. Attempts at open pound *Macrocystis* harvest in Port Clarence District in 1991 and 1992 were unsuccessful.

Local fishers from Teller, Shishmaref, and Kotzebue have also expressed interest in exploiting these stocks.

SPRING/FALL FOOD/BAIT FISHERY

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

HISTORICAL RESOURCE INVESTIGATIONS

Resource investigations of Port Clarence and Kotzebue Sound area herring stocks were conducted by ADF&G from March 1976–September 1978 (Barton 1978). These studies indicated 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 areas. This data does not preclude possibility of more southern stocks utilizing this region, such as stocks which winter near the Pribilof Islands and migrate to the western Alaska coast to spawn. Migration to central Bering Sea for wintering herring stocks along the western Seward Peninsula is unlikely; rather they might remain in coastal lagoons, bays or inlets which are warmed by river discharge under the ice (Barton 1978). Size difference may be explained by warmer water temperatures from river discharge. Water temperatures and feeding conditions in deep ocean waters are probably more favorable for growth than those in herring winter habitats along the Seward Peninsula, where apparently they have become adapted to Arctic conditions (Barton 1978).

Aerial surveys are difficult in Port Clarence District because of organic coloring of waters of Imuruk Basin, Tuksuk Channel, Grantley Harbor and to a lesser extent, Port Clarence. Presence of other species of fish caught in test commercial gear sets indicate the need for verifying any biomass sighted. A further complicating factor within Port Clarence is spring ice conditions. Port Clarence is a sheltered body of water, which becomes highly stained over winter and takes time to clear once ice melts. Typically, outside waters are significantly warmer than inside waters, which are covered by ice longer thereby slowing solar gain and water mixing. Soon after ice begins to shift, herring move into the warm shallow lagoons to spawn. Herring are invisible to aerial observation once they enter stained water. The best aerial survey conditions exist just outside the entrance to Port Clarence, where herring mass just before the ice moves. One or 2 surveys were flown each of the past several years, but virtually no herring were observed because the narrow window of time for seeing fish was missed.

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 8).

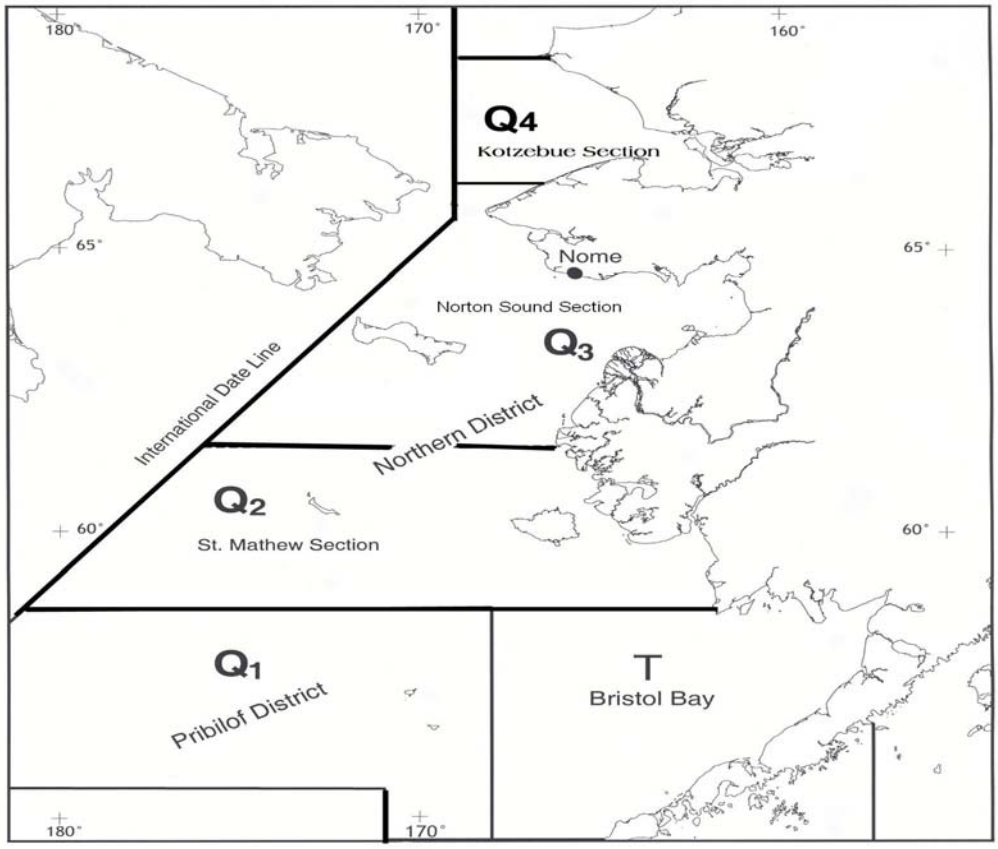

Figure 8.–King crab fishing districts and sections of Statistical Area Q.

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 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 super exclusive designation went into effect for the Norton Sound commercial crab fishery June 27, 1994. This designation stated a vessel registered for the Norton Sound crab fishery may not be used to take king crab in any other registration area during that registration year. Later, a vessel moratorium put into place before the 1996 season was intended to precede a license limitation program. Community Development Quota (CDQ) groups were allocated a portion of the summer harvest beginning in 1998. Although CDQ allocation was in place, no harvest occurred until the 2000 season. The North Pacific License Limitation Program (LLP) went into effect for the Norton Sound crab fishery January 1, 2000. The program states a vessel which exceeds 32 feet in length overall must hold a valid crab license issued under LLP by National Marine Fisheries Service. Regulation changes and location of buyers resulted in harvest distribution moving eastward in Norton Sound in mid 1990s (Figure 22).

Norton Sound red king crab length-based population model developed by Zheng et al. (1998) incorporates trawl surveys, winter and summer pot studies, and summer and winter fisheries data

from 1976 to present (Figures 23–33). The model can be used to project estimates in years when no trawl survey occurs, allowing abundance-based management of Norton Sound red king crab fisheries.

During the March 1999 meeting of BOF, a new management strategy was enacted for the Norton Sound summer red king crab fishery. A threshold level of abundance of legal male red king crab biomass was set at 1.5 million pounds. A summer commercial season may only open if the legal crab population exceeds 1.5 million pounds, and if legal biomass falls in the range of 1.5 to 2.5 million pounds the harvest rate will not exceed 5% so the stock may rebuild. However, if legal biomass is 2.5 million pounds or more, the harvest rate can be no more than 10%. Improved abundance estimates and the current management strategy will greatly reduce the risks of over fishing the stock.

Estimates of legal red king crab biomass in Norton Sound indicate periods of weak and strong recruitment, and have been standardized to account for design and coverage based on trawl and pot surveys (Appendix E2). Norton Sound legal red king crab biomass in 1976 was estimated to be roughly 1.7 million crabs. By 1982, legal biomass had fallen to 0.9 million crab because of little recruitment and high harvest rates in the summer commercial fishery. The population then gradually recovered to an estimated 1.3 million legal crabs in 1991. The trawl survey conducted during August of 1996 indicated a reduced stock size and estimated legal biomass at 0.5 million crabs. In 1999, the legal red king crab population of 1.6 million crabs was estimated by trawl survey to be near the historical high biomass (Appendix E2). The population level had nearly tripled since 1996. An all-time high prerecruit-one male abundance (sublegal male crab with carapace length 90–104 mm) was also detected. Conversely, the exceptionally weak 1999 prerecruit-two (sublegal male crab with carapace length 76–89 mm) abundance estimate suggested at least 1 year of weaker recruitment beginning during the 2001 summer fishery. Results from the 2002 trawl survey indicated an estimated abundance of legal male red king crabs at 0.77 million with a corresponding biomass of approximately 2.3 million pounds. This was less than half of the 1999 abundance estimate, yet above the all-time low in 1996. This decrease was expected because the 1999 trawl survey indicated exceptionally weak prerecruit-two abundance. Prerecruit-two crabs observed in 1999 made up the recruit and postrecruit portion of the 2002 legal population (Figures 25 and 26). The 2002 estimated abundances for prerecruit-one and prerecruit-two males were 0.52 and 0.43 million crabs, respectively. The prerecruit-one male abundance estimate was lower than the all-time high observed in 1999, but higher than the 3 prior surveys. These crabs molted and gave a boost to the recruit portion of the legal crab biomass in 2003. Prerecruit-two male crab abundance was over four times greater than 1999 and fourth highest abundance estimate since 1976 indicating increased recruitment for 2004 and 2005 seasons. In 2006, legal male abundance was estimated at approximately 0.73 million crabs, which is 95% of the 2002 estimate and 68% of the long-term trawl survey average. Prerecruit-1 male abundance was estimated at approximately 0.57 million crabs, 10% greater than the 2002 estimate, and prerecruit-2 male abundance was estimated at approximately 0.78 million crabs, the highest abundance estimate on record, which is expected to increase recruitment for the 2008 and 2009 seasons. Taken as a whole, the surveys indicate periods of weak and strong recruitment.

The ADF&G length-based population model was developed to predict biomass for the red king crab population in Norton Sound. Incorporating data from trawl surveys, winter and summer pot studies, and summer and winter fisheries from 1976 to present, the model estimated legal male

crab abundance for management of the summer commercial crab fishery. The 2004 abundance estimate for the summer crab fishery was 4.4 million pounds, up 30% from 3.1 million pounds estimated for 2003. The revised 2005 estimate for the summer commercial crab fishery was 4.8 million pounds, an increase of approximately 9% from 2004. These higher abundance estimates compared to 2003 reflect healthy recruitment in 2004 and 2005. A revised population estimate for 2006 was 3.2 million pounds, a decrease of 33% from 2005 estimate.

CDQ Fishery

The Norton Sound and Yukon Delta CDQ groups divided the CDQ allocation. Only fishers designated by the Norton Sound and Yukon Delta CDQ groups are allowed to participate in this portion of the king crab fishery. Fishers were required to have a CDQ fishing permit from CFEC and register their vessel with ADF&G before they made their first delivery. Fishers 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 Figure 21. 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.

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 fishers 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 fishers offload their catch for delivery to Anchorage. ADF&G will continue to make a concerted effort to coordinate catch sampling with fishers 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 fishers in Norton Sound to obtain a permit before fishing. Fishers 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 crabs) (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 fishers averaged 100 crabs each.

ST. LAWRENCE ISLAND

DISTRICT BOUNDARIES

Formerly, St. Lawrence Island Section lay 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˚N latitude (Figure 8). The St. Lawrence Island Section north of 66˚N latitude is now the Kotzebue Section.

COMMERCIAL FISHERY OVERVIEW

Commercial catches in the former St. Lawrence Island Section have only been reported for 4 years. In 1983, 52,557 pounds of blue king crab were delivered from 13 landings. The commercial crab fleet concentrated their efforts near the southeast shore of St. Lawrence Island. In 1984, a regulation was adopted to close waters within 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 fishers and reduce impacts on marine mammal subsistence harvests. In 1989, 3,603 pounds of red king crabs and 984 pounds of blue king crabs were delivered from 8 landings. In 1992, 53 pounds of blue king crabs were landed. In 1995, 7,913 pounds of blue king crabs were delivered from 3 landings. Only 1 permit fished in 2005 in the Kotzebue area, harvesting 316 pounds of red king crab. This was the first reported commercial king crab harvest in the St. Lawrence Island Section since 1995.

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.

MISCELLANEOUS FISH OVERVIEW

Several species other than salmon, crab and herring are utilized for commercial and subsistence purposes in Norton Sound, Port Clarence and Kotzebue 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 southern Kotzebue Sound and in the Koyuk River of Norton Bay in Norton Sound (Figure 9).

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 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.

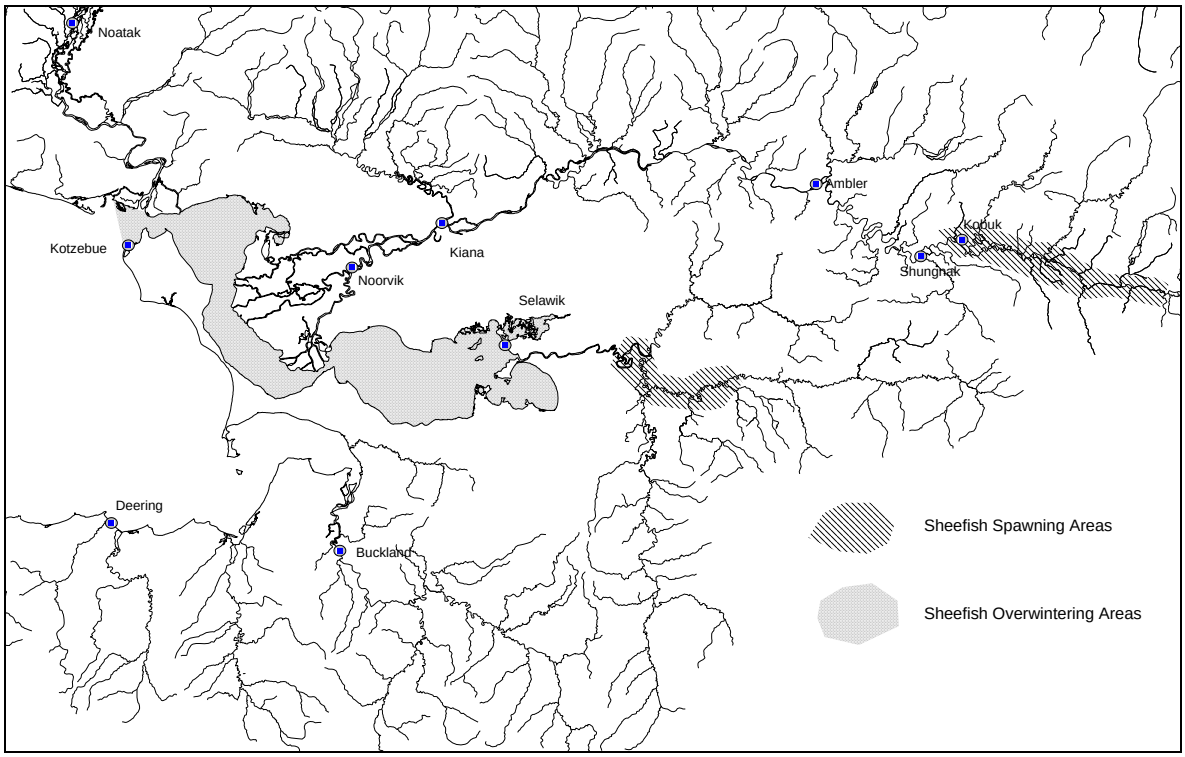

Figure 9.–Kotzebue and Kobuk River Valley villages and their spatial relationship with inconnu spawning and overwintering areas.

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 pounds 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.

Summer and fall subsistence fishing for inconnu occurs along Kobuk and Selawik Rivers from June through October with gillnets, beach seines, and rod and reel. In spring, residents of Kotzebue, Noorvik and Selawik harvest inconnu with hand jigs through the ice of Hotham Inlet and Selawik Lake. In early winter, Kotzebue, Noorvik and Selawik fishers use gillnets set under the ice in Hotham Inlet and Selawik Lake. No requirement exists for harvest reporting; however, during various years from 1973 to 2004, Division of Subsistence conducted household subsistence harvest surveys in various villages in Kotzebue District.

In 1987, BOF adopted 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 inches (5 AAC 01.120). This regulation was intended to conserve the larger, breeding portion of the stock. Except for this gear restriction, ADF&G does not restrict timing, area, or quantity of subsistence inconnu harvest.

Commercial Fishery

Most commercial fishing effort occurs through the ice near Kotzebue in Hotham Inlet with gillnets ranging from 5 1/2 inch to 7 inch stretched mesh. Recorded commercial catches have remained relatively small; however, undocumented catches are believed to be significant and therefore, harvest totals should be considered minimum estimates. Restricted markets outside northwestern Alaska greatly limit commercial activity and most individuals who normally participate in the winter commercial fishery also fish for subsistence purposes. Incidentally caught inconnu are sold by commercial salmon fishers in years there is a market, but only in small amounts. Reported harvest and effort in the commercial fishery has declined in recent years. Since 1998, harvest has been no more than 1,250 pounds, compared to the highest harvest of 26,200 pounds in 1978 (Appendix F1).

Sport Fishery

Kotzebue district sheefish are considered by many to be among the pinnacle of Alaskan 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, 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 fishers on upper Kobuk River in 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 2008).

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 in 1984 through 1990 because of high, turbid water, poor weather conditions, or lack of personnel. Through the early 1990s, incomplete escapement and catch data provided little basis for assessing current population status of inconnu in Kotzebue district, however some local residents were concerned that the inconnu stocks were declining.

Because of these concerns, a cooperative tagging project on inconnu in Kotzebue District began in 1994. This study was conducted by Division of Sport Fish, U.S. Fish & Wildlife Service (USFWS), and National Park Service (NPS). Spawning inconnu were tagged in Upper Kobuk River and Selawik River. Roughly 600 sheefish were tagged in Kobuk River by Division of Sport Fish and 150 in Selawik River by USFWS in 1994. During the fall of 1995, roughly 617

inconnu were tagged in Upper Selawik River and approximately 1,386 were tagged in Upper Kobuk River. In 1996, 2,300 were tagged in Upper Kobuk and 500 in Selawik River. The Selawik River project ended in 1996. In 1997, 1,757 inconnu were tagged in Upper Kobuk River. Spawning population estimates of inconnu in Upper Kobuk River were 32,273 in 1995, 43,036 in 1996 and 26,800 in 1997. Inconnu spawn upstream of the village of Kobuk; greatest observed concentrations were between Meneluk and Beaver Rivers. After spawning is complete in late September, fish disperse to downstream overwintering areas. In Selawik River, the spawning population estimate was 5,200 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, and Kotzebue 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 outmigrating fry. Also, they are sometimes present in streams during summer to feed on salmon eggs, especially during years of high pink salmon abundance.

Because Dolly Varden are a late-maturing fish (generally age 6–7), they are susceptible to overfishing by commercial, subsistence, and/or sport fisheries. Consequently, commercial fisheries have been maintained at low levels or prohibited to both reduce potential of overharvest and provide for reproductive and subsistence needs.

Subsistence Fishery

Dolly Varden is an important component in the diet of subsistence users in Norton Sound-Kotzebue Sound 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 fishers 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. Note: historical subsistence Dolly Varden catches in Appendix F5 are minimal figures because of survey timings. Most Dolly Varden harvests take place before or just after freeze up. The village of Noatak usually fishes before freeze up, but Kobuk River villages of Shungnak and Noorvik fish for Dolly Varden throughout the winter. Since 1962, catches made by residents of Kivalina ranged from 7,000 to

65,000 Dolly Varden annually, but no harvest surveys have been conducted there since 1986 (Appendix F5).

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 catches are dependent upon available markets. The typical season catch, when buyers are purchasing Dolly Varden throughout August, is between 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 in both 2006 and 2007.

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-pound 4 oz.) taken from the Wulik River in 2002, 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 remote location and difficult access of fishing sites (Scanlon 2008).

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 and Kotzebue areas and can also be found at various times of year in inshore marine waters. Spawning occurs in freshwater in late August to October when lakes and streams are close to freezing.

Commercial Fishery

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

Subsistence Fishery

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

The relative importance of whitefish is higher in the 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 1998–2002 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). No harvest data on whitefish has been collected since 2004.

Historical Escapement

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

SAFFRON COD

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

No extensive commercial fishery on tomcod in Norton Sound, Port Clarence or Kotzebue areas has ever occurred. During 1980, one fisher caught and sold 89 pounds (98 tomcod) in Nome

Subdistrict. In 1983, one Nome area fisher caught and sold 2,548 pounds (4,348 tomcod) and in 1989 one fisher sold 1,800 pounds locally. These fish were used for dog food, crab bait, and human consumption.

In 1994, NSEDC provided a market for several fish species not commercially utilized in the past. The need for crab bait was the primary factor in initiating the fishery at Unalakleet, where 1,402 pounds of tomcod were sold in 7 deliveries during January and February of 1994. In 1995, the NSEDC market was not present, likely a factor in the reduced total harvest of 52 pounds, which sold for $.50 per pound for a total value of $26.00. No commercial harvest was reported from 1996 through 2006.

MISCELLANEOUS FINFISH SPECIES

Other finfish species taken for subsistence in Norton Sound, Port Clarence, and Kotzebue areas include: rainbow smelt (boreal smelt), capelin, northern pike, starry flounder, yellow fin sole, Arctic flounder, Alaska plaice, Arctic grayling, burbot, in fall time, 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 the 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

Rainbow smelt, like saffron cod, had a limited commercial harvest at Unalakleet. During January, February and March of 1994, 631 pounds of rainbow smelt were reported sold in 9 deliveries for bait. Smelt and cod harvests from Unalakleet both occur in estuarine areas. Smelt were reported higher in the water column than cod. Either species could often be harvested from the same jigging site. 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 Kotzebue areas, but are relatively small. Average annual sport fish harvests for Arctic grayling are 1,200 in Norton Sound, and 1,400 in Kotzebue area. Despite low harvests, average Arctic grayling sport fish harvests are the second highest non-salmon species in Norton Sound, and the highest averaged in Kotzebue area (Appendix F3).

SECTION 2: SALMON FISHERIES

2007 NORTON SOUND SALMON FISHERY

Regulatory Changes For 2007

The Alaska Board of Fisheries (BOF) made several regulation changes at meetings in February and March 2007 for the management of Norton Sound salmon (Menard 2007).

BOF changed the stock of concern classification for Subdistrict 1 (Nome) chum salmon from a management concern to a yield concern. Subdistricts 2 and 3 (Golovin and Moses Point) chum salmon stocks and Subdistricts 5 and 6 (Shaktoolik and Unalakleet) Chinook salmon stocks were continued as stocks of yield concern.

A Chinook salmon management plan for Subdistricts 5 and 6 (Shaktoolik and Unalakleet) was established to address the poor Chinook salmon runs in the 2000s. Beginning June 16, subsistence fishing in marine waters of Subdistricts 5 and 6 were restricted to two 48-hour fishing periods a week from 6:00 p.m. Monday until 6:00 p.m. Wednesday and from 6:00 p.m. Thursday until 6:00 p.m. Saturday. Also beginning June 16, subsistence fishing in Unalakleet River was restricted from 8:00 a.m. Monday until 8:00 p.m. Tuesday and from 8:00 a.m. Friday until 8:00 p.m. Saturday.

Upper subsistence fishing boundaries on Nome River changed to the ADF&G marker at the VOR site approximately 2 miles upstream of its mouth, and the boundary on Cripple River was changed to the ADF&G marker approximately 200 yards upstream from its mouth. Penny River subsistence boundaries were from the mouth to the ADF&G marker approximately 100 yards upstream from the mouth. Subsistence fishing for chum salmon remains closed in Cripple and Penny Rivers, but other salmon may be taken in areas open to fishing. All additional closed waters to subsistence fishing for salmon listed in 5 AAC 01.175 remained the same, except BOF amended the regulation to allow subsistence fishing with a hook and line attached to a rod or pole in those closed areas, provided sport fish methods and means are followed.

BOF also approved new regulations, effective July 1, to allow for cash sales of up to $200 worth of subsistence-taken finfish per household, per year, harvested in Norton Sound-Port Clarence area only. Persons intending to sell any subsistence-taken herring, salmon, whitefish, trout, or other finfish will need to obtain a free customary trade permit from Nome ADF&G and record cash sales on the permit. Sales cannot be made to a fishery business or resold by the buyer, and may only occur within the Norton Sound-Port Clarence Area.

Commercial Fishery Season Summary

The second greatest coho salmon harvest highlighted the 2007 Norton Sound commercial salmon fishery. Well above average runs of chum and sockeye salmon also occurred in many areas of Norton Sound. There was limited commercial interest in chum salmon and a small scale commercial sockeye salmon fishery occurred in Port Clarence. The pink salmon run was average for an odd-numbered year, but much smaller than expected after the record to near record runs for an odd-numbered year in 2005. There was little interest in pink salmon, except for a small commercial fishery to obtain bait for the crab fishery. Once again the Chinook salmon run was poor and no commercial fishing targeting Chinook salmon was allowed.

The first commercial salmon fishing period occurred in Moses Point Subdistrict on July 10 to target chum salmon. Commercial fishing was allowed for two 24-hour or two 30-hour fishing periods per week for the remainder of the season. The chum salmon escapement goal had already been reached at ADF&G-operated Kwiniuk River counting tower and coho salmon run also proved to be strong with no concern that subsistence needs or escapement would not be met. Although the commercial fishery was targeting chum and coho salmon the buyer also purchased the incidental pink salmon harvest until the last period in July.

In Shaktoolik and Unalakleet Subdistricts, the first commercial salmon fishing period occurred later than usual on July 18 with a 24-hour period targeting chum salmon, which also allowed the department to determine early coho salmon run strength. Catches in the Unalakleet River test net for chum salmon had been average, but the department held off on commercial fishing to protect Chinook salmon. The Chinook salmon run has been poor throughout the 2000s and the department closed Chinook salmon subsistence fishing in early July in both the marine waters in Shaktoolik and Unalakleet Subdistricts and in Unalakleet River.

ADF&G test net in Unalakleet River had some very early season catches of coho salmon similar to last year's run of record catches. In the first commercial salmon fishing period, chum salmon catches were average, but coho salmon catches in both Shaktoolik and Unalakleet Subdistricts were a record for mid July. After a second 24-hour period on July 20 had the same results, the department switched to coho salmon management and two 48-hour commercial fishing periods a week were allowed in Shaktoolik and Unalakleet Subdistricts. The buyer also purchased pink salmon harvested during the first 2 fishing periods in Unalakleet Subdistrict.

The Unalakleet River test net had a record coho salmon catch for July. An all-time record harvest in one 48-hour period in Unalakleet Subdistrict and a near record harvest in Shaktoolik Subdistrict at the end of July resulted in a request from the buyer to return to 24-hour fishing periods. After the peak of the coho salmon run had passed the buyer was able to handle the harvest and 48-hour fishing periods resumed in southern Norton Sound on August 9.

Table 1 lists Norton Sound salmon current year commercial harvests and Appendix A1 lists historical harvests relative to the recent 5-year (2002–2006) and 10-year (1997–2006) averages. The coho salmon harvest of 126,115 was nearly 230% above the recent 5-year average and 300% above the recent 10-year average. There were 5 chum salmon directed periods in Moses Point Subdistrict from July 10 to July 24 and 2 chum salmon directed chum salmon periods (July 18 and July 20) in Shaktoolik and Unalakleet Subdistricts. There was limited market interest in pink salmon for crab hanging bait and the buyer purchased 3,769 pink salmon in the Norton Sound District. The Unalakleet River test net had above average catches of Chinook and chum salmon, and the second largest coho salmon catch, although pink salmon catches were below average.

Combined commercial harvest of all salmon species ranked third in the last 10 seasons in Norton Sound and ranked first with pink salmon harvest excluded (Appendix A1). Seventy-one permit holders participated in the commercial fishery (Appendix A2), 10 more than last year. However, this total includes 11 permit holders from Moses Point Subdistrict. Prior to this year, commercial salmon fishing had not occurred in Moses Point Subdistrict since 2001. The previous 5-year average was 36 permits fished and the previous 10-year average was 55 permits fished. Fishery value in 2007 to the fishers of $572,195 (Appendix A3) was well above the 5-year average of $175,156 and 10-year average of $188,236. Average value per permit holder was $8,059, a record without adjusting for inflation. Average price paid for Chinook and sockeye salmon was $0.55/lb, $0.53/lb for coho salmon, and $0.14/lb for chum salmon (Appendix A4).

Only 1 salmon buyer operated in Norton Sound during the 2007 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 neighboring Shaktoolik and Moses Point Subdistricts.

Subsistence Fishery Season Summary

Subsistence salmon permits were required for all households in Norton Sound Subdistricts 1–3 (Nome, Golovin, and Moses Point) for each location intended to fish. 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 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 fishers reach their harvest limit in 1 river, they can fish in other rivers until they reach the limit in those rivers.

Norton Sound District household subsistence surveys were conducted in Shaktoolik, Unalakleet, Stebbins, and St. Michael, and attempts were made to contact 100% of the households. Catch information for Subdistricts 5 and 6 are presented in Appendices A10 and A11, while Appendix A12 presents current and historical subsistence survey results for Stebbins and St. Michael.

In Norton Sound District, there are limits on subsistence salmon harvests only in Nome Subdistrict where salmon limits have been in place since 1985. In 2007, in anticipation of a good chum salmon run, Nome Subdistrict was not closed to salmon fishing in mid June for the second year in a row. From 1991 through 2005, Nome Subdistrict would close to subsistence salmon in mid June in order to for ADF&G to determine the run strength of chum salmon before allowing fishing. Furthermore, Tier II regulations were not in effect because the chum salmon run was projected to exceed the amount necessary for subsistence. Eventually, limits on chum and sockeye salmon were waived in most of Nome Subdistrict. Subsistence permits are important to management because they identify users, fishing effort, harvests, and limits. Return rates have been close to 100% for most permit areas.

A new BOF approved regulation, effective July 1 of this year, allowed for cash sales of up to $200 worth of subsistence-taken finfish per household, per year, in the Norton Sound-Port Clarence area only. In 2007, only 5 customary trade finfish permits were issued for Norton Sound. Reported sales were 8 chum salmon for $90 and 3 coho salmon for $30.

Season Summary by Subdistrict

Nome-Norton Sound Subdistrict 1

For over 30 years subsistence salmon permits have been required for Nome Subdistrict, during the 2007 season 329 subsistence salmon permits were issued, slightly less than the 367 permits issued in 2006 (Table 2). The most permits ever issued for Nome Subdistrict was 491 permits in 2004. The 2004 number was much higher likely because sport fishing remained closed for over a week early in the pink salmon run and subsistence hook and line fishing was open at that time. Appendix A6 compares historical subsistence salmon catch by species and by year in Nome Subdistrict.

This year for the second time since 1990, Nome Subdistrict did not close to subsistence and sport fishing for salmon on June 15. Because of an expected surplus of chum salmon the regular gillnet fishing schedule of 72 hours in marine waters and two 48-hour fishing periods a week in freshwater subsistence areas was in effect from mid June until mid July. From mid July until mid August, the fishing schedule by regulation increased to 5 days a week in marine waters and after August 15 marine waters were open continuously. In September, by regulation, fresh water subsistence areas opened to subsistence salmon fishing continuously.

An emergency order was also issued allowing beach seining during regular subsistence gillnet openings the last week of July (Appendix G5).

Season limits for subsistence salmon fishers were waived on July 13 for chum and sockeye salmon, except in Penny, Cripple, and Solomon Rivers which are closed to the taking of chum salmon by regulation.

Observations during the season indicated that Nome River was once again the river that had the most permits fished.

Golovnin Bay-Norton Sound Subdistrict 2

The 2007 Salmon Management Plan for Golovnin Bay Subdistrict 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 that date, the chum salmon run usually can be assessed and fishing time adjusted accordingly. However, there has been no commercial chum salmon fishing in Subdistrict 2 since 2002 as escapement had fallen short of 30,000 chum salmon goal at Niukluk River and ADF&G took a conservative approach to allowing commercial fishing. By mid July, department run projections showed the chum salmon escapement goal would easily be met, but the buyer was unable to purchase salmon because of commitments elsewhere in Norton Sound.

The Niukluk River 2007 tower count of 50,994 chum salmon was the largest chum salmon passage recorded since 1997 (Table 3 and Appendix A21). The tower count of 43,617 pink salmon ranked third of the 7 odd-numbered years which pink salmon have been counted, but well behind the 270,424 pink salmon counted in 2005. The tower count of 3,498 coho salmon ranked 8 of 13 years of counting.

This was the fourth year that subsistence salmon permits were required for Subdistrict 2, and 153 permits were issued this year, compared to 152 permits issued in 2006, 174 permits in 2005, and 199 permits in 2004. Number of Subdistrict 2 permits issued to Nome residents has dropped by 25% since 2004, but number of permits issued to Golovin and White Mountain residents has been similar each year. It is likely that the easing of fishing restrictions in Nome Subdistrict has been one of the reasons that fewer Subdistrict 2 permits have been requested by Nome residents. Appendix A7 compares historical subsistence salmon catch by species and by year in Golovin Subdistrict.

Moses Point-Norton Sound Subdistrict 3

In 2007, Moses Point Subdistrict chum, coho, and pink salmon (compared to other odd-numbered-year) salmon runs were above average. Yet, the Chinook salmon run was weak. Commercial fishing targeting chum salmon began July 10, but by the end of July the coho salmon catch started to exceed chum salmon catch during each fishing period. Commercial salmon harvest in 2007 was 1 Chinook salmon, 1,648 pink salmon, 4,567 chum salmon, and 5,908 coho salmon for 11 permit holders (Table 4). The coho salmon harvest was the second highest on record.

Escapement past the Kwiniuk tower was 258 Chinook salmon, 27,756 chum salmon, 54,255 pink salmon, and 9,429 coho salmon (Appendix A20). Chinook salmon passage was below the escapement goal range of 300–550 fish for the second year in a row. Chum salmon escapement was the tenth highest and pink salmon escapement was fourth highest in an odd-numbered year since the 1970s. Counting at the tower has only been extended into the coho salmon run the last 7 years at Kwiniuk River tower and this year was the fifth highest escapement recorded. However,

counting ended early this year because of flooding and there was commercial fishing for coho salmon for the first time since 2001. This year's coho salmon escapement would likely have ranked second or third highest if counting had been extended to mid month and if commercial fishing had not occurred.

This was the fourth year that subsistence salmon permits were required for Subdistrict 3, and 64 permits were issued, compared to 63 permits for last year, 70 permits in 2005, and 58 permits in 2004. Historical comparison of subsistence salmon catch by species and by year in Moses Point Subdistrict is presented in Appendix A8.

Norton Bay-Norton Sound Subdistrict 4

Norton Bay Subdistrict typically has difficulty attracting a buyer due to its remoteness and a reputation for watermarked fish. Due to lack of timely salmon escapement information, Norton Bay Subdistrict is typically managed similar to Shaktoolik and Unalakleet Subdistricts because they reflect similar trends in salmon return strength and timing. In 2007, no commercial salmon fishing occurred due to lack of buyer interest and no subsistence catch information was obtained. However, Appendix A9 presents historical subsistence salmon catch for Norton Bay Subdistrict for some of the past 40 years.

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 Unalakleet River test net, North River counting tower, and subsistence interviews in Unalakleet are used to set early fishing periods in both Subdistricts. As the season progresses, test net catches, commercial catch indices, and North River tower counts are used to assess run strength of each salmon species. Aerial surveys are only useful for late season escapement assessment because of long travel time between the fishery and spawning grounds.

Commercial fishing is typically only allowed after Chinook salmon have been observed entering Unalakleet River in increasing numbers for a week's time to assure the harvest is directed on actively migrating stock and not on milling fish. In Shaktoolik and Unalakleet Subdistricts, directed commercial king salmon fishing has only occurred in 3 of the previous 8 years, and in only 1 year since 2001. Restrictive action was taken in the subsistence and sport fisheries in 2003, 2004, and in 2006. Prior to 2007, the lower end of the North River tower sustainable escapement goal (SEG) range had not been achieved since 2003.

To increase Chinook salmon escapements, BOF adopted a more conservative Subdistricts 5 and 6 King Salmon Management Plan (5 AAC 04.395) in February 2007. Under the new plan, commercial fishing directed at king salmon can only occur if the midpoint of the North River tower sustainable escapement goal (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 (1,200) will be achieved.

The reported inseason subsistence Chinook salmon catch peaked during the period ending June 23 in marine waters, and inriver catches peaked during the period ending June 30. Fishing effort

in marine waters was identical for periods 2 through 4, but catches from periods 3 and 4 dropped by nearly 50 percent from period 2. Comparable reductions in catch rates were observed in the inriver subsistence fishery a week later during period 5, although fishing effort was also reduced during this period. Only 120 Chinook salmon had been enumerated at the North River tower by July 3. Given the observed reductions in catch rates as well as the weak Chinook salmon passage at North River, there was a good chance that the king salmon escapement would once again fall short of the lower end of the SEG range. Consequently, the marine waters of Subdistricts 5 and 6 and Unalakleet River drainage were closed to subsistence salmon fishing with gillnets by emergency order on July 4 to maximize escapement of the latter portion of the king salmon run. The sport fishery was closed on July 5. Beach seining was permitted, but all Chinook salmon had to be returned to the water immediately.

Chinook salmon escapements began to improve during the week following the closure, and by July 14, the lower end of the escapement goal range was surpassed. Once it was projected that escapements would be achieved, Unalakleet River below the confluence of North River and marine waters of Subdistricts 5 and 6 were re-opened to subsistence salmon fishing with gillnets. However, mesh size was restricted to 6 inches or less to protect the larger, and more predominantly female, king salmon entering the river. Gillnetting was also prohibited in upper Unalakleet River and North River to protect those king salmon that were approaching or present at spawning areas. This was the first year since 2003 that the escapement goal has been reached, and the first time since 1999 that the Chinook salmon passage exceeded the midpoint of the escapement goal range.

Chum salmon catches at the test net were above average during the second week of July and the buyer expressed interest in purchasing chum salmon. Additionally, the cumulative coho salmon catch at the test net for that time period was the third best on record. Consequently, ADF&G opened Shaktoolik and Unalakleet Subdistricts to commercial salmon fishing for two 24-hour periods on July 18 and 20. These brief periods were permitted to allow some harvest of chum salmon and obtain an early index of coho salmon run strength. In Shaktoolik Subdistrict, chum salmon catches outnumbered coho salmon catches during period 1, but the coho salmon catch surpassed chum salmon catch in period 2. Coho salmon catches outnumbered chum salmon catches by nearly 2 to 1 for periods 1 and 2 in Unalakleet Subdistrict and coho salmon catches were record setting. As a result, the department opened the season to the regular commercial fishing schedule of two 48-hour periods per week. Record-setting coho salmon catches persisted through period 5, at which time the buyer requested 24-hour periods to ensure they could process the record catch. Record catch rates were observed during period 6, but dropped off during period 7 and the 48-hour fishing schedule resumed beginning period 9 and continued until the season closed by regulation on September 7.

Commercial catches in 2007 in Shaktoolik Subdistrict were 5 Chinook salmon, 6,076 chum salmon, and 31,810 coho salmon harvested by 15 permit holders (Table 5). Unalakleet Subdistrict 2007 commercial catch harvested by 47 permit holders was 13 Chinook salmon, 2 sockeye salmon, 2,121 pink salmon, 11,788 chum salmon, and 88,397 coho salmon (Table 6). Coho salmon harvests in both subdistricts were the second best on record, and the 24,033 coho salmon harvested during period 5 was a record harvest for a single period. Additionally, the 956,751 pounds of coho salmon harvested in both subdistricts was a record, and the coho salmon average grounds weight of 7.9 pounds was the third highest on record (Appendix A5). Shaktoolik coho salmon catch was 220% above the recent 5-year average and 340% above the

recent 10-year average (Appendix A10), and this season's Unalakleet coho salmon catch was 216% above the recent 5-year average and 285% above the recent 10-year average (Appendix A11).

Escapement

Table 3 and Appendix A16 summarize escapement assessments for the major index river systems of Norton Sound and Port Clarence Districts in 2007. These assessments are often qualitative and relative to historical escapement sizes. Most of the chum salmon assessments are described relative to a Sustainable Escapement Goal (SEG) for an index area. An SEG is a level of escapement that is known to provide for sustained yields over a 5-to-10 year period, and is used in situations where a Biological Escapement Goal (BEG) cannot be estimated due to the absence of a stock specific catch estimate. BEG is based on spawner-recruit relationships estimated to provide maximum sustained yield. An Optimal Escapement Goal (OEG) is a specific management objective for escapement that considers biological and allocative factors and may differ from SEG or BEG.

ADF&G escapement projects in Norton Sound include counting towers on Kwiniuk and Niukluk Rivers, a test net operated on Unalakleet River, and a weir on Nome River. NSEDC provides essential support for these projects. For current and historical catch data for the Unalakleet River test net, see Table 9.

Six additional counting projects were also operated in the management area this season. Snake, Eldorado, and Pilgrim Rivers had weir projects which were set up and operated by Kawerak Corporation and the North River counting tower project was a cooperative project operated by ADF&G in June and Unalakleet IRA for the remainder of the summer. NSEDC provided essential support to all organizations. Pikmiktalik River counting tower, near Stebbins, is a cooperative project by Kawerak and U.S. Fish & Wildlife Service. For 2 weeks during peak sockeye salmon passage, ADF&G and NSEDC operated a weir at the headwaters of Glacial Creek which flows from Glacial Lake into the Sinuk River. Except for the Pikmiktalik River and Glacial Lake projects, most projects have been operational since the mid 1990s. All projects supplied important daily information to the department that was very useful to management of local salmon resources and will become more important the longer they operate. For current and historical escapement data for these enumeration projects, see Appendices A17 to A25.

Aerial survey conditions were fair to good in most of Norton Sound for the 2007 season. However, lack of aircraft hampered surveying a number of rivers. In addition, weather deteriorated after the first week of September and some rivers were not surveyed for coho salmon escapements during peak escapement periods. As usual, Nome Subdistrict streams received the most intensive assessment efforts because salmon stocks local to the Nome area are strictly regulated, easily accessed by road system, and are exposed to intensive subsistence and sport fishing pressure.

Chinook Salmon

The 2007 Chinook salmon run was below average throughout most of Norton Sound. Only the eastern area of Norton Sound has sizable Chinook salmon runs, while rivers in Unalakleet and Shaktoolik Subdistricts are the primary Chinook salmon producers in Norton Sound. Unalakleet test net catches, the North, Kwiniuk, and Niukluk River towers, aerial surveys, and subsistence reports were the primary assessment tools for judging Chinook salmon run strength in Norton

Sound. Unalakleet River test net catch was approximately double the 5-year average and 25% above the 10-year average. However, improved catches this year may be attributed to the reduced subsistence fishing time and closure of both subsistence and sport fishing for Chinook salmon. The North River tower count of 1,950 Chinook salmon represented the first time in which the escapement goal range of 1,200 to 2,600 fish had been reached since 2003. On July 25, aerial surveys were conducted of Shaktoolik, Unalakleet, Old Woman, and North Rivers under good to excellent viewing conditions. Counts were 412, 642, 179, and 554 Chinook salmon respectively. The Shaktoolik River aerial survey SEG (400–800) was reached for the first time since it was established in 1999, as was the combined Old Woman/Unalakleet River SEG of 550–1,100, also established in 1999 (Table 3). Unfortunately, the tower-based SEG (300–550) at Kwiniuk River failed to be reached for the second consecutive year and has not been achieved in 5 of 9 years since 1999. The 823 Chinook salmon enumerated during an aerial survey of Tubutulik River was well above average and the fourth highest aerial survey count since 1980. Chinook salmon passage at Niukluk River tower was below average and at Pilgrim River it was average.

Chum Salmon

Chum salmon escapements were well above average in most areas in 2007. Nome River weir passage was a record since weir operations began in the mid 1990s with 7,034 chum salmon counted in 2007. Eldorado River weir passage was the second best on record with 21,312 chum salmon counted and was second only to last year when 42,105 chum salmon were counted. Snake River weir passage of 8,147 chum salmon was the second best since counting began in 1995 and exceeded the minimum escapement goal of 1,600 chum salmon for the seventh year in a row. The 21,080 chum salmon counted at Pikmiktalik tower in 2007 was record setting and nearly doubled last year's record passage of 12,711 chum salmon. Kwiniuk River tower counts of 27,756 chum salmon ranked fourteenth highest in the 43-year project history and the Niukluk River tower counts of 50,994 ranked fourth best since counting began in 1995. Unalakleet River chum salmon escapements were above average based on test net catches, but the North River chum salmon passage of 8,046 was below the 5-year average, but above the 10-year average. Pilgrim River weir passage of 35,334 chum salmon was over three times the 2004 and 2005 weir passage and over two times the 2003 weir passage, but behind last year's record passage of over 45,000 chum salmon.

Coho Salmon

Coho salmon are found in nearly all chum salmon producing streams throughout Norton Sound with primary commercial contributors being Unalakleet and Shaktoolik Rivers. Because inclement weather is normal in this area during August and September, escapement data based on aerial surveys can be incomplete. Previous to this decade, few projects counted coho salmon. More recently, Norton Sound ground-based escapement assessment projects are intended to monitor coho salmon as well as chum salmon and are becoming more important to fisheries management. The 2007 coho salmon escapements were near record to well above average in southern Norton Sound to average and slightly below average in northern Norton Sound. In Unalakleet River, cumulative test net catches ranked second in the 23-year project history, behind 2006's record catch. Whereas, North River tower count of 19,944 surpassed the 2006 record of 19,189. The Pikmiktalik River tower count of 13,522 coho salmon ranked second highest of 4 years that coho salmon have been counted. Kwiniuk River tower passage of 9,429 coho salmon was slightly below average, but the coho salmon run in the area was determined to

be above average based on commercial fishing catches. The Niukluk River tower passage of 3,498 coho salmon although second best in the last 5 years was ranked fifth of the last 10 years. Nome and Snake Rivers have only counted coho salmon for 7 years, but 2007 ranked fourth for Nome River with 2,437 coho salmon, and third for Snake River with 1,760. Aerial surveys of rivers indicated that escapement had been reached on numerous streams. One problem with 2007 aerial surveys for coho salmon were high numbers of sockeye salmon in Nome (534) and Snake (1,354) Rivers. Sockeye and coho salmon can be difficult to distinguish during aerial surveys unless sockeye salmon exhibit the brighter red coloration that coho salmon lack. Likely, sockeye salmon with darker red coloration similar to coho salmon were misidentified during the Snake River aerial survey.

Pink Salmon

For over 20 years, pink salmon returns to Norton Sound have followed an odd/even year cycle with the even-numbered year returns typically much higher in number than the odd-numbered years. In 2007, the pink salmon run was higher than most odd-numbered years, but was a big decrease from the parent-year escapements of 2005. Escapement goals for pink salmon in Norton Sound were easily made in 2007.

Sockeye Salmon

Sockeye salmon are typically found in small numbers throughout the Norton Sound District with the largest spawning stock at Glacial Lake where 1,000 to 2,000 sockeye salmon usually return to spawn each year. However, since 2004 over 5,000 sockeye salmon have returned to spawn each year. In 2007, sockeye salmon into Glacial Lake were only monitored for 2 weeks with a weir at Glacial Creek near the outlet of the lake and about 1 mile upstream from the confluence with the Sinuk River, where 4,533 sockeye salmon were counted (Appendix A23). An aerial survey previous to weir installation counted 124 sockeye salmon in the lake, and a survey at weir pullout counted over 500 sockeye salmon in Sinuk River. Later in the season, an aerial survey count of Glacial Lake after peak spawning was 1,505 sockeye salmon. The sockeye salmon aerial escapement goal is 800 to 1,600 for Glacial Lake (Table 3).

In 2007, counting weirs at Nome and Snake Rivers reported much higher numbers of sockeye salmon than seen in previous years. At Nome River, 534 sockeye salmon surpassed the 2005 record of 381 sockeye salmon. At Snake River, a record 1,354 sockeye salmon were counted through the weir, which was well above previous record counts of 275 in 2005 and 302 in 2006. In September, an NSEDC crew seined coho salmon in Snake River for egg takes and reported catching higher numbers of sockeye salmon than encountered in previous years.

Enforcement

Two wildlife troopers patrolled the Norton Sound District 2007 commercial salmon fisheries in Unalakleet and 1 Fish and Wildlife Protection officer patrolled in Nome. In addition, Nome ADF&G commercial fisheries division has 8 deputized staff members with the ability to cite or ticket an offense, of which 2 worked the commercial salmon fishery in Subdistricts 5 and 6. The subsistence fishery had no official patrol, but random checks were conducted by 2 ADF&G personnel.

2008 NORTON SOUND SALMON OUTLOOK

Salmon outlooks and harvest projections for the 2008 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. Except for Chinook salmon there have been near record to record runs for all salmon species in most river drainages in Norton Sound since 2004. Parent-year escapements for Chinook salmon have been mostly poor in the 2000s. Parent-year escapements in 2004 were poor to fair for chum salmon and parent-year escapements in 2003 for this year's returning 5-year old chum salmon were very poor. Parent-year escapements for coho salmon were poor to fair for coho salmon. Pink salmon parent-year escapements were well above average to near record setting in a number of Norton Sound river drainages in 2006.

The excellent salmon runs in recent years for most species indicate good ocean survival conditions and will likely help to counter poor parent-year escapements for this year's returning salmon. ADF&G is cautiously optimistic that most salmon runs in Norton Sound will be average and that the coho salmon run will be above average. However, because of poor parent-year escapements for many salmon species, the department will take action to restrict fisheries if salmon runs show early signs of being weak.

The Chinook salmon run is expected to be below average and no commercial fishing targeting Chinook salmon is expected. Subsistence restrictions are expected again in southern Norton Sound. The Chinook salmon harvest will likely be low as an incidental catch in other salmon directed fisheries. Chum salmon runs are expected to be average, but limited commercial fishing targeting chum salmon is expected. There is some buyer interest in chum salmon this year and the harvest could be 40,000 to 50,000 fish if there is a buyer. The only expected subsistence restrictions for chum salmon will be in Nome Subdistrict where catch limits will be in effect. In the last several years there have been record breaking pink salmon runs in many locations when compared to the respective even- and odd-numbered run year cycles. However, in 2007 the pink salmon run was average for an odd-numbered year and well below the run in 2005. There was limited buyer interest in 2007 and nearly 4,000 pink salmon were sold in the commercial fishery. If there was a sufficient market the harvest could be 500,000 pink salmon in 2008. However, because of limited market the harvest will likely be less than 200,000 pink salmon. The coho salmon run in 2008 is expected to be above average based on good ocean survival conditions in recent years and the near record and record runs in recent years in southern Norton Sound. The commercial harvest is expected to be 80,000 to 100,000 fish and no subsistence fishing restrictions are expected, except for catch limits in Nome Subdistrict.

2007 PORT CLARENCE SALMON FISHERY

Regulatory Changes For 2007

BOF made several regulation changes at meetings in February and March 2007 for management of Port Clarence salmon (Menard 2007).

A commercial fishery for sockeye salmon may be opened in Port Clarence District from July 1 through July 31 with openings established by emergency order. The Guideline Harvest Level (GHL) was from 0 – 10,000 sockeye salmon if ADF&G projected an inriver run of 30,000 sockeye salmon for Pilgrim River. Once the inriver goal was reached the department could exceed the GHL. The commercial fishing boundaries set by BOF are from the marker at Four-

mile point across to the marker at Sunset Creek and from the marker at the entrance to Brevig Lagoon across to the marker at Cape Riley.

BOF closed the southwestern half of Salmon Lake to all subsistence salmon fishing to protect the majority of the sockeye salmon spawning grounds and the northeastern half of Salmon Lake may now only be opened by emergency order.

BOF also approved new regulations for Customary Trade, allowing cash sales up to $200 worth of subsistence-taken finfish per household, per year, that included Port Clarence.

Commercial Fishery Season Summary

In 2007, there was a commercial salmon fishery in Port Clarence District for the first time since 1966. ADF&G projected an inriver run of 40,000 to 50,000 sockeye salmon for the Pilgrim River; therefore, commercial fishing was allowed. Commercial fishing started on July 8, one week after the allowed start date of July 1 as the buyer set up logistics for the inaugural season. Fishing periods occurred periodically during the month. In consultation with the buyer, fishing periods were 12 hours a day, midnight until noon. Three permit holders fished during the season, and catches of chum salmon (3,183) exceeded sockeye salmon (1,152) 3 to 1 (Table 7). Average weight was 6.6 pounds for chum salmon and 7.3 pounds for sockeye sockeye. With an average price of $.11/lb for chum and $.75/lb for sockeye salmon, combined value of the fishery was $8,684.

Subsistence Fishery Season Summary

This year, 2007, was only the fourth year subsistence household permits were required for all waters of Port Clarence District, even though permits have been required to fish the Pilgrim River drainage for over 40 years. In 2007, sockeye salmon limits were waived for the Pilgrim River drainage due to an above average return. The only catch limit in Port Clarence District for 2007 was for Kuzitrin River drainage, where it is 100 salmon per household of which no more than 2 can be Chinook salmon. In 2007, this limit was not waived.

In Port Clarence District, since 2004 when permits were required, the number of permits issued has been in the mid 300s. In 2007, 363 permits were issued for all waters of Port Clarence District, including Pilgrim River. Of this number, 201 were to fish only the Pilgrim River, and 162 were for the remaining waters of Port Clarence District. Harvests reported by permit holders in Port Clarence District from 1963 to 2007 are presented in Appendix B2.

For Pilgrim River, subsistence permits have been required since 1964 and since 2002 the number of permits issued has skyrocketed with record sockeye salmon runs. The 201 permits issued in 2007 were similar to the 198 permits issued last year. In 2003, first year of the great runs of sockeye salmon, there were 97 permits issued. Number of permits issued peaked in 2004 when 223 permits were issued and in 2005 there were 210 permits issued. Comparatively, in 2002 only 25 permits were issued and the counting tower in operation that year at the same location as the current weir estimated less than 4,000 sockeye salmon passed. In 2003, weir passage was nearly 43,000 sockeye salmon and in 2004 escapement through the weir was a record of over 85,000 sockeye salmon. In 2005 and 2006, weir passage was nearly 56,000 and over 52,000 sockeye salmon respectively. Escapement this year was over 43,000 sockeye salmon.

This was the third year subsistence salmon fishing was allowed in Salmon Lake since being closed for more than 30 years. By regulation Salmon Lake is closed to all fishing from July 16

through August 31, and in previous years ADF&G kept salmon fishing closed throughout the lake to protect spawning salmon. Effective this year, BOF passed a regulation to keep the southwestern half of Salmon Lake closed to protect spawning salmon, but to allow the northeastern half to be opened by emergency order. In 2005, the department opened the northeastern half of Salmon Lake after August to harvest sockeye salmon. Four permits were issued and permit holders were limited to 50 sockeye salmon. Reported harvest was 19 sockeye salmon. In 2006, only 1 permit was issued for Salmon Lake, but that permit holder did not fish. In 2007, the limit was raised to 100 sockeye salmon, but the 1 permit issued indicated 40 sockeye salmon harvested.

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 of commercial fishing. Aerial surveys show an increasing trend of sockeye salmon returns to Salmon Lake since 1986 (Appendix B1). In 2007, an aerial survey of Salmon Lake and Grand Central River after peak spawning estimated 14,920 sockeye salmon in Salmon Lake and 5,692 sockeye salmon in Grand Central River, a tributary to Salmon Lake. Combined escapement goal of Salmon Lake and Grand Central River is 4,000–8,000 sockeye salmon (Table 3).

Salmon Lake and Port Clarence District has had a sockeye salmon spawning population near 10,000 fish previous to 2003 at. But, beginning in 2003 sockeye salmon escapements skyrocketed and annual weir counts have been higher than 42,000 sockeye salmon (Appendix A18). Pilgrim River escapement for 2007 was fourth highest on record with 43,432 sockeye salmon counted past the weir. Comparatively, in 2002 less than 4,000 sockeye salmon were counted past the tower (but counting started late and some sockeye salmon were missed).

From 1997 to 2001, ADF&G conducted a fertilization program at Salmon Lake partially funded by NSEDC and BLM to restore sockeye salmon to historic 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, suspended again in 2005 and 2006, and restarted in 2007 by NSEDC.

Enforcement

In 2007, there was no enforcement presence in the Port Clarence District subsistence fishery. Both Nome US Fish and Wildlife Protection officer and Nome ADF&G deputized staff were unable to patrol the area.

2008 Port Clarence Salmon Outlook

The GHL set by BOF for the Port Clarence sockeye salmon fishery allows for a harvest of up to 10,000 sockeye salmon. Based on excellent runs of sockeye salmon in recent years ADF&G expects the GHL to be reached if there is a sufficient fishing fleet.

A commercial fishery for sockeye salmon may be allowed in Port Clarence District from July 1 through July 31 with openings established by emergency order. The commercial salmon fishing area is all waters inside of the ADF&G regulatory marker from the western tip of Cape Riley to the ADF&G regulatory marker at the entrance to Brevig Lagoon and from the ADF&G regulatory marker at Four Mile Point across Grantley Harbor to the mouth of Sunset Creek.

If subsistence fishing reports indicate normal catches of sockeye salmon then commercial fishing will be allowed after June 30 with openings announced by emergency order. Continued commercial fishing will be dependent on sufficient subsistence fishing catches and an inriver goal of 30,000 sockeye salmon projected to be met at Pilgrim River.

No subsistence fishing time restrictions are expected in 2008, but if the weir project and aerial surveys indicate poor runs of a particular species the department will need to implement fishing restrictions.

2007 KOTZEBUE SOUND SALMON FISHERY

Commercial Fishery Season Summary

The Kotzebue Sound commercial salmon fishery opened on July 10 and closed by regulation after August 31. However, the lone buyer was unable to purchase fish until July 17 because of logistical problems getting the facility ready.

Gear is limited to set nets with an aggregate of no more than 150 fathoms per fisher. Fishers generally operate with one end on or near shore and with all 3 shackles connected. Fishers also set in deeper channels in the mud flats further out from shore. Most gear used in the district is 5-7/8 in (14.9 cm) or 6 in (15.2 cm) stretch mesh gillnet.

During most of the 2000s, the Kotzebue commercial fishery has been limited by buyer capacity. In 2002 and 2003, there was no onsite buyer. In 2004 and 2005, one onsite buyer was present and fish were processed locally. Beginning in 2006, the new buyer shipped the catch in the round to Anchorage for processing.

As in recent years, ADF&G opened the commercial fishery continuously and allowed the buyer to set the fishing time for their fleet. There were 46 permit holders who sold fish to the buyer, including 1 catcher-seller who sold fish to the buyer and to Kotzebue area residents. The number of permit holders that fished has been in the low 40s in the past 3 years, and is less than half the permit holders that fished in the 1990s, and well below the nearly 200 permit holders that fished in the early 1980s (Appendix C1).

The overall chum salmon run to Kotzebue Sound in 2007 was estimated to be above average based on commercial harvest rates, subsistence fishers reporting average to above average catches, and the Kobuk test fish index being above average. The commercial harvest consisted of 147,087 chum salmon, compared to 197,060 average harvest from 1962 to 2006 (Appendix C1). Also harvested during the commercial fishery but kept for personal use were 2 chum salmon, 15 Chinook salmon, 3 pink salmon, 2 coho salmon, 960 Dolly Varden and 13 sheefish (Table 8). Likely, additional fish were kept for personal use and not reported on fish tickets.

Beginning July 10, the season was opened to commercial fishing until further notice, but the buyer was unable to purchase salmon until July 17. The buyer had ten 8-hour fishing periods and one 6-hour fishing period in July. After the fishing period on July 30 when over 9,000 chum salmon were caught, the buyer reduced fishing periods for their fleet to 6 hours or less for the remainder or the season. However, after the fishing period on August 9 when over 9,000 chum salmon were again caught, the buyer reduced fishing periods for their fleet to 5 hours or less, but on August 15 when over 9,000 chum salmon were caught again, the buyer reduced fishing periods to 4 hours or less for the remainder of the season. The fishery closed by regulation after

the August 31 fishing period. The 2007 run showed surprising strength in late August unlike most years when catches are usually less than 2,000 chum salmon per fishing period.

A total of 1,209,842 pounds of chum salmon (average weight 8.2 lbs) were sold at an average of $0.20 per pound (Appendices C2 and C3). Total exvessel value was $243,149 to Kotzebue Sound fishers. Average value for each participating permit holder was $5,286. The total exvessel value represents 41% of the $597,562 historical average (Appendix C4).

Primary fishery management objectives are to provide adequate chum salmon escapement through the commercial fishery to ensure a sustained run and to provide for the subsistence priority. A test fishery conducted on the Kobuk River for the fifteenth consecutive year provides the only inseason escapement information. 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 were 4- and 5-year-old fish with commercial catch sample age composition 39% for age-0.3 fish and 50% for age-0.4 fish. Age composition was similar to years past, but average weight of chum salmon was one-half pound more than last year.

Subsistence Fishery Season Summary

Subsistence household surveys have been regularly conducted in Kotzebue District from 1962–2004 by the Division of Subsistence, but since 2004, no subsistence surveys have been conducted in the area (Appendices C5 and C6). In 2007, no subsistence salmon surveys were scheduled, and no other information on subsistence harvest is available other than comments that chum salmon fishing on Kobuk and Noatak Rivers was very good in August.

Escapement

In 2007, an ADF&G test fish project located just downstream from the village of Kiana monitored escapement in Kobuk River. Similar to last year, the Kobuk River test fish index did not follow the typical pattern in 2007 (Table 10 and Figure 10). A smaller than average number of index points were generated in the first four-fifths of the season and a well above average number of index points were generated in the last fifth of the season indicating a later, but average chum salmon run in Kobuk River.

This year's test fish chum salmon CPUE cumulative index was 1,342 points and ranked fifth of fifteen years. The midpoint at the test net was August 9, the second latest on record. The lowest index recorded in the Kobuk River drainage was 494 in 1993 when aerial surveys indicated escapement just reached the SEG. However, in 1993 the project started later than usual and the 164 test net drifts were the lowest number of drifts compared to all other years. In the last 8 years, including 2007, at least 200 test net drifts have been attempted each season.

Test fishing was conducted twice during the chum salmon run in lower Noatak River by ADF&G to obtain ASL information. Percentage of age-0.3 fish was 33% for Noatak River, ranking last in 14 years of test fishing; however, with samples taken from only 2 days of test fishing, the age composition may have been skewed. On Kobuk River the percentage of age-0.3 fish was 61%, and percentage of age-0.4 fish caught in the test net was 33%.

Aerial surveys of the Kobuk River and Noatak River drainages were not conducted this season because of limited aircraft availability and inclement weather that occurred during September.

Enforcement

Kotzebue District has been without a US Fish and Wildlife Protection officer since February of 2004. Since then, the Nome US Fish and Wildlife Protection officer has made attempts to patrol the area, but was unable for the 2007 chum salmon fishery. However, Nome ADF&G commercial fisheries division does have 8 deputized staff members with the ability to cite or ticket an offense, of which 3 worked the 2007 Kotzebue District chum salmon fishery.

2008 KOTZEBUE SALMON OUTLOOK

Outlook for the 2008 season is based on parent-year returns and returning age classes observed in test fish samples from the Kobuk and Noatak Rivers, and Kotzebue commercial catch samples in 2007. During the 2008 season, the 4-year-old component of the run is expected to be above average. 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 above average. The commercial harvest is expected to fall within the range of 100,000 to 150,000 chum salmon, if market conditions can accept that level of harvest.

SECTION 3: PACIFIC HERRING FISHERIES

2007 NORTON SOUND PACIFIC HERRING FISHERY

Commercial Fishery Season Summary

Sac Roe

There was no market interest in herring sac roe in Norton Sound during the 2007 season. Historical information for the Norton Sound 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 interest expressed in the commercial *Macrocystis* spawn-on-kelp fishery in 2007. However, 1 permit holder participated in the commercial spawn-on-wild kelp fishery. A single processor was interested in purchasing between 2,000–4,000 pounds and area managers opened the spawn-on-wild kelp fishery June 13 and closed it June 19. The wild kelp fishery remained open for 1 week to allow reasonable opportunity for harvest if the permit holder experienced delays attributed to inclement weather and/or mechanical problems. There were a total of 0.14 short tons of spawn-on-wild kelp harvested and the estimated value of the fishery was $1,425 in 2007.

Bait Fishery

There was a directed bait herring fishery in 2007. NSEDC purchased 32.7 tons of bait herring from 7 fishers, and the total ex-vessel value of the fishery was $19,620 (Table 11).

Commercial Fishery Management

ADF&G projection for the 2007 spawning biomass for the Norton Sound sac roe fishery was 38,415 tons (Menard and Kent 2007). At 20% exploitation rate, the guideline harvest level for Norton Sound District was 7,683 tons with 6,627 tons allocated to the gillnet fishery.

Herring were first observed on June 6 when ADF&G biologists estimated 2,900 tons of herring in Subdistricts 2 and 3. Shortly thereafter, the department opened the sac roe herring fishery effective 12:00 p. m. on June 7. On June 8, NSEDC personnel conducted an aerial survey in Subdistricts 1–3 and estimated approximately 28,000 tons of herring. Fishing began on June 9, and as a result of limited processing capacity, the fishery was left open continuously to permit the most favorable herring fishing schedule as determined by the buyer and the fishers.

Two shackles of gear for a total length of 100 fathoms were allowed to be fished. The fishery officially ended on June 30, but the buyer quit purchasing bait herring on June 15 when it was determined that there was enough bait for the upcoming crab season.

One ADF&G field crew operated from Cape Denbigh during the 2007 season. The test fish crew's presence and sampling efforts on the herring grounds are critical to the proper management of the fishery and biological documentation of the stocks (Figures 11–20).

There were 2 emergency orders issued during the 2007 Norton Sound herring fishery (Appendix G5).

Catch Reporting and Enforcement

The herring buyer registered for the 2007 season communicated well with ADF&G during the fishery and compliance with requested catch reports was very good. Nearly all fishing vessels in the fleet have VHF radios, but their activities are often beyond normal ranges. Test fishing results were relayed via SSB radio or satellite telephone.

Due to the limited Norton Sound fishery in 2007, the Unalakleet field office personnel consisted of 1 assistant area biologist to conduct aerial survey biomass estimates. No US Fish and Wildlife Protection officers were on the Norton Sound herring grounds during the 2007 fishery; however, the assistant area biologist stationed in Unalakleet for the 2007 herring season was deputized and able to cite fishing violations if necessary.

Biomass Determination

Inclement weather, particularly fog and strong west winds led to poor viewing conditions for most of June. Consequently, a peak aerial survey was not conducted in 2007. Weather was good to fair for the single survey conducted by the department on June 6, when 2,870 tons of herring were observed (Table 12).

2008 Norton Sound Pacific Herring Outlook

The biomass of herring projected to return in 2008 to Norton Sound is 37,401 tons. A 20% exploitation rate would result in a harvest guideline of 7,480 tons. A maximum of 320 tons of herring are reserved to allow the pound fishery to harvest a maximum of 90 tons of product (combined weight of herring roe and kelp). This leaves 7,160 tons for sac roe harvest. The beach seine harvest is, by regulation, 10% of the sac roe projected harvest, or 716 tons. The 2008 herring fishery will be opened by emergency order and the fishery will close by emergency order when up to 20% of the available herring biomass has been harvested. Varied harvest rates may be applied to individual subdistricts based on biomass distribution, roe quality, weather, and sea ice conditions. Ages 5, 6 and 11 are expected to dominate the returning population, contributing 7%, 38% and 24%, respectively. Age 9 and older herring are expected to comprise 41% of the biomass (Figure 20).

SECTION 4: KING CRAB FISHERIES

NORTON SOUND CRAB FISHERY

Abundance

The ADF&G length-based population model estimated legal male crab abundance for the 2007 summer commercial crab fishery at 3.1 million pounds. This is a decline of approximately 3% from the revised population estimate of 3.2 million pounds for 2006. Current size composition data from the 2007 winter crab study show the portion of the crab population classified as recruits has decreased 28% since the 2006 survey and the postrecruit male crab population has decreased 52% (Soong 2007). The winter pot study also points to the highest percentage of pre-1 population in the last 20 years and a slightly below average pre-2 population. Pre-1 crabs require one molt to become part of legal population next year, while pre-2 crabs require two molts. These findings indicate that legal crab population in 2007 is less than 2006, but is expected to increase for 2008 followed by a possible decline in 2009. A 10% exploitation rate on the legal population ≥ 4-3/4 inch carapace width equates to a guideline harvest level (GHL) of 315,000 pounds of crab. This follows the harvest strategy set by the Board of Fisheries. By regulation, the Community Development Quota (CDQ) fishery is allocated 7.5% of the summer season harvest; therefore, the CDQ harvest quota was set at 23,625 pounds preseason.

Summer Open Access Commercial Fishery

The 2007 summer open access commercial crab fishery was opened by regulation at 12:00 noon, July 1 in the Norton Sound Section. The GHL was 291,375 pounds of crab. Two companies were registered to buy crab in Norton Sound during the season. One of these buyers operated a seafood processing plant in Nome and purchased crabs from local Norton Sound fishers, while some fishers based in Unalakleet and non-resident fishers delivered to the second buyer in Anchorage. Some fishers also sold their catch dockside as catcher/sellers. The open access portion of the fishery was closed by emergency order 12:00 noon, August 7, 2007 when the harvest approached the goal of 291,375 pounds.

Total harvest from fish ticket reports was 101,672 red king crabs or 289,264 pounds. Of this total, 119 pounds were seized by the Department of Public Safety, 965 pounds were reported as deadloss, and 3,932 pounds reported as personal use. A total of 30 vessels made deliveries, 30 permit holders fished, and 234 landings were made. Average weight for commercially caught crab was 2.85 pounds. Number of pots registered was 1,200 and there were 8,496 pot pulls throughout the fishery. Average price paid was $2.49 per pound, and exvessel value of the fishery was $693,412. Appendix E3 gives historical summer commercial (including CDQ) red king crab fishery performance from 1977 to present.

First commercial delivery was made on July 3 (seized crabs were delivered June 30), and final delivery was made August 8. The commercial crab fleet either delivered to a small tender vessel in northeastern Norton Sound, which then delivered the crabs to Nome for processing, or sold their crabs directly to a seafood processing plant. The majority of fishers delivered to the plant in Nome, while 2 Unalakleet fishers and 2 non-resident fishers flew live crabs to a buyer in Anchorage.

Fish ticket reports document that 14 statistical areas were fished in the open access and CDQ fisheries (Table 13). Same as last year, stat area 636401 had the highest catch with 123,092 pounds of crab. The other large catches came from stat areas 656401 (70,065 pounds) and

626401 (61,704 pounds). The catch from stat areas east of 164°W longitude made up 71.1 percent of the harvest (Figure 22; Appendix E1). Overall, CPUE was 12.1 crabs per pot compared to the higher 2006 CPUE of 17.3 crabs per pot.

CDQ Fishery

The 2007 CDQ fishery opened at 12:00 noon June 15, 2007, but fishers did not start fishing until June 18 because the buyer was not yet ready to buy. The harvest was 23,611 pounds of crab, almost 100% of the CDQ allocation (Table 14). With only 14 pounds remaining of the quota, the fishery was not reopened after the close of the open access fishery. Eight vessels participated and 17 landings were made. There were a total of 622 pots pulled. Average price paid to fishers for their harvest was $2.50 per pound, and exvessel value was $56,808 for the CDQ fishery, which closed 12:00 noon June 28, 2007.

This was the seventh year a CDQ harvest occurred since the CDQ fishery was implemented in 1998, and the fourth year the fishery harvested or nearly harvested the entire allocation.

Commercial Catch Sampling

Carapace length measurements and shell age were collected from 6,125 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 88.1% of the total legal crabs sampled, and old-shell crabs made up 11.9% (Table 14). 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 45% of the legal crabs sampled and postrecruit crabs made up 55%, a decrease of 27% in the number of postrecruit crabs compared to samples from the 2006 fishery (Appendix E4). Overall mean carapace length of legal male crabs was 117.0 mm (Table 15 and Figure 33). This was a decrease from the 2006 fishery and is most likely due to the decrease seen in postrecruit crabs in 2007. For comparison of historical length composition of Norton Sound red king crab summer commercial harvests from 1981 to 2006, see Figures 27–33.

Enforcement

Two Alaska Department of Public Safety troopers were on hand in 2007 to patrol the end of the Norton Sound CDQ fishery and all through the open access king crab fishery. In addition, 2 deputized ADF&G staff worked the king crab fishery.

Winter Commercial Fishery

The winter commercial season opened November 15, 2006, and 8 fishers registered. Based on fish tickets submitted, the first landing was made January 17. From then until the last landing on May 5, eight fishers made a total of 106 landings and 926 potlifts, with an overall CPUE of 3.6 and average weight of 2.4 pounds per crab. Price of crab averaged $3.06 per pound. A total of 3,313 crabs were sold, with percentages of crabs sold (and CPUE) each month as follows: January 2% (1.5), February 37% (3.4), March 36% (3.7), April 24% (4.2), and May 2% (5.0). Sea ice conditions were very bad for the majority of the 2006–2007 season, and some commercial fishers reported losing pots when sea ice moved out several times during the season. Commercial fishing occurred from 12 miles east to 12 miles west of Nome, excluding the area closed to commercial fishing from 3.5 miles east to 2.0 miles west of Nome.

The harvest is generally divided between local residents who buy crab directly from the fishers, the seafood plant in Nome, and other non-local markets such as Anchorage. Most fishers consider commercial crabbing a sideline and hold other jobs. Usually, few of the winter crab fishers sell the majority of the crab. Appendix E5 presents winter commercial and subsistence harvests of crab from 1978 to 2007.

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. During the 2006–2007 Nome area winter crab season, 129 permits were issued, 127 returned, and 116 permit holders reported fishing for a total of 10,690 crabs (compared to 1,239 crabs for 2006) kept for winter subsistence use (Appendix E5). Table 16 gives a breakdown of crabs caught by gear type.

During the 2007 Nome area summer subsistence crab season, 19 subsistence permits were issued and returned, and 5 permit holders reported fishing for a total harvest of 1,008 crabs. Crabs kept per fisher averaged 202 crabs for summer 2007, which was an increase compared to only 21 crabs per fisher the previous summer when 3 permit holders harvested only 62 crabs.

Future Resource Investigations

A winter pot study is planned from February through April of 2008. Results of the winter project will be used in the length-based model to project the summer 2008 legal biomass and appropriate guideline harvest level (GHL) for the summer commercial crab fishery. Size composition by year from the winter king crab project is shown in Appendix E6.

In July and August 2008, ADF&G will conduct the next triennial Norton Sound red king crab trawl survey.

ST. LAWRENCE ISLAND CRAB FISHERY

Abundance

In late July and throughout August 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 catch primarily of egg bearing female blue crabs, and indicates 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 viability of a summer fishery. However, to aid in the development of a commercial fishery in the area, NSEDC is interested in introducing a proposal to BOF to decrease the legal size of commercial blue king crab from 5.5 inches to either 5.0 or 5.25 inches. Preliminary data indicates blue king crab size at maturity is very similar to Norton Sound red king crab whose legal size is 4.75 inches.

In August of 2006, 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 of the standard ADF&G triennial Norton Sound red king crab trawl survey locations. 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. More survey work is necessary to generate an abundance estimate and better understand the distribution of blue king crab. 2006 survey data should only be considered a starting point to understanding the Bering Strait and St Lawrence Island blue king crab stock.

Commercial Fishery

In 2006, 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 fishers to expand fishing opportunity to an area with little commercial utilization since 1995. In 2007, no permits fished in the Kotzebue section.

SECTION 5: MISCELLANEOUS SPECIES

INCONNU (SHEEFISH)

Commercial Fishery

Although inconnu *Stenodus leucichthys*, commonly known as sheefish, were likely harvested and sold in 2007 by several fishers, no fish tickets were submitted to ADF&G. In Kotzebue Sound District, no fishers reported selling inconnu (Appendix F1). Sheefish is 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 1985 to 1990, or since 2004. Data from subsistence household surveys conducted by Divisions of Commercial Fisheries and Subsistence for 1966–1987 is 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.

Due to sport fish harvest report methods, 2007 data is unavailable for this report; however, 2006 reports indicate increased harvest of 810 sheefish from only 393 in 2005. Sheefish sport harvests average 1,100 annually (Appendix F3).

Escapement

Sheefish escapement is determined from aerial surveys and ADF&G test fishing project on the Kobuk River. In 2007, no aerial surveys of the Kobuk and Selawik Rivers were conducted. Test fishing on the Kobuk River resulted in 669 sheefish caught in 208 drifts, for a cumulative CPUE of 590.

DOLLY VARDEN

Commercial Fishery

Dolly Varden *Salvelinus malma* are occasionally incidentally caught in commercial salmon fisheries in Norton Sound and Kotzebue Districts. In 2007, no Dolly Varden were reported

caught in Norton Sound commercial fisheries. Kotzebue District reported 960 caught but not sold, compared to last year when 278 were caught and not sold (Appendix F4).

Subsistence and Sport Fishery

Subsistence harvest data for Dolly Varden was not recorded for Norton Sound or Port Clarence, and household surveys for Dolly Varden subsistence catches were not conducted in Kotzebue Sound area communities in 2007. However, historical survey data collected by the Divisions of Sport Fish and Subsistence from 1962–2004 for the villages of Kivalina and Noatak are shown in Appendix F5.

Due to sport fish harvest report methods, 2007 data is unavailable for this report; however, 2006 reports indicate sport fish harvests were higher from Norton Sound areas than Kotzebue/Chukchi Sea areas (Appendix F3). The majority of Dolly Varden sport fish harvests in Norton Sound is taken from Unalakleet River, and it was highest in 2006 with 1,307, and the Nome River was second with 959 harvests. However, in 2005 the highest Dolly Varden sport fish harvest was 1,148 from the Fish-Niukluk Rivers, but in 2006 zero harvest was reported. Due to expansion in subsistence gear regulations to include rod and reel, Dolly Varden harvests were likely considered subsistence and not reported. Overall, Dolly Varden sport fish harvests in Norton Sound averaged 3,800 annually. (Appendix F6)

Escapement

Dolly Varden escapement is determined from aerial surveys conducted by ADF&G Division of Sport Fish in the Kotzebue area, and weir or tower counts in Norton Sound. In 2007, no aerial surveys were flown for Noatak or Kivilina Rivers, but surveys were flown on Wulik River, which counted a total of 99,311 Dolly Varden (Appendix F7).

WHITEFISH

Commercial Fishery

During the 2006–2007 season, whitefish was sold by only 1 fisher, who waived confidentiality. Between September 29 and October 5, 2006, a total of 3,723 pounds were sold for an average price of $.44/lb, with a total value to the fisher of $1,631.

Subsistence and Sport Fishery

Subsistence harvest data for whitefish was not recorded for Norton Sound or Port Clarence Districts, and household surveys for whitefish subsistence catches were not conducted in Kotzebue Sound area communities in 2007. However, historical survey data collected from 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 is collected in Norton Sound, Port Clarence, or Kotzebue Sound Districts for whitefish.

SAFFRON COD

Commercial Fishery

No commercial or commercial bycatch of saffron cod *Eleginus gracilis*, commonly known as tomcod, have been reported since 1995.

Subsistence and Sport Fishery

In Norton Sound areas tomcod is primarily fished by "jigging" through the ice. Since no subsistence permit is required and a sportfish 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 2007, Norton Sound household subsistence surveys were conducted; however, subsistence harvests of tomcod were not collected.

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TABLES AND FIGURES

Table 1.–Norton Sound commercial salmon harvest summary by subdistrict, 2007.

		Subdistricts						
		1	**2**	**3**	**4**	**5**	**6**	**Total**
Number of Fishers [a]		0	0	11	0	15	47	71
								0
Chinook	Number	0	0	1	0	5	13	19
	Weight (lbs)	0	0	28	0	61	117	206
								0
Sockeye	Number	0	0	0	0	0	2	2
	Weight (lbs)	0	0	0	0	0	16	16
								0
Coho	Number	0	0	5,908	0	31,810	88,397	126,115
	Weight(lbs)	0	0	45,327	0	253,270	703,481	1,002,078
								0
Pink	Number	0	0	1,648	0	0	2,121	3,769
	Weight (lbs)	0	0	3,997	0	0	6,540	10,537
								0
Chum	Number	0	0	4,567	0	6,076	11,788	22,431
	Weight (lbs)	0	0	29,795	0	41,241	80,350	151,386
								0
								0
Total	Number	0	0	12,124	0	37,891	102,321	152,336
	Weight (lbs)	0	0	79,147	0	294,572	790,504	1,164,223

[a] Seventy-one permit holders fished in the Norton Sound District; 2 permit holders fished at least 1 period in Shaktoolik Subdistrict and at least 1 period in Unalakleet Subdistrict.

Table 2.–Tier I subsistence salmon harvest for northern Norton Sound, 2007.

	Permits	Number of Salmon Harvested					
	Fished [a]	Chinook	Sockeye	Coho	Pink	Chum	Total
Marine Waters	36	12	168	360	326	2,020	2,886
Bonanza River	15	0	12	173	80	213	478
Cripple Creek	4	1	10	6	0	2	19
Eldorado River	13	0	5	76	3	246	330
Flambeau River	2	0	13	32	1	68	114
Nome River- above weir	11	3	25	141	138	72	379
Nome River- below weir	47	0	5	205	198	271	679
Penny River	4	0	10	13	3	5	31
Sinuk River	14	0	49	3	26	13	91
Snake River - above weir	9	1	0	4	25	2	32
Snake River - below weir	14	0	0	55	10	14	79
Solomon River	15	1	0	35	40	12	88
Nome Subdistrict Total [b]	**205**	**18**	**297**	**1,103**	**850**	**2,938**	**5,206**
Cape Woolley [c]	**2**	**0**	**15**	**0**	**1**	**2**	**18**
Marine Waters	13	84	157	212	256	213	922
Kachavik River	11	2	2	46	1,363	893	2,306
McKinley River	5	0	0	56	0	1	57
Chinik Creek	4	0	0	59	244	12	315
Fish River	53	98	160	574	1,879	2,719	5,430
Niukluk River- above tower	15	0	2	114	88	348	552
Niukluk River- below tower	10	4	0	103	150	31	288
Klokerblok River	1	0	0	15	0	0	15
Golovin Subdistrict Total [d]	**98**	**188**	**321**	**1,179**	**3,980**	**4,217**	**9,885**
Marine Waters	9	51	0	41	30	219	341
Kwiniuk River - above tower	5	5	0	34	8	16	63
Kwiniuk River - below tower	40	86	0	749	282	257	1,374
Next Creek	7	0	0	49	0	0	49
Tubutulik River	27	111	0	129	131	439	810
Iron Creek	10	7	0	1,289	1,291	1,403	3,990
Kwik Creek	1	0	0	4	0	0	4
Moses Point Subdistrict Total [e]	**52**	**260**	**0**	**2,295**	**1,742**	**2,334**	**6,631**
Marine Waters	74	49	3,827	617	1,303	3,253	9,049
Tuksuk Channel	13	9	311	68	129	612	1,129
Imuruk Basin	1	0	40	0	0	0	40
Agiapuk River	4	0	0	0	0	296	296
American River	1	0	0	0	0	75	75
Pilgrim River- above weir	39	11	2,078	14	31	88	2,222
Pilgrim River- below weir	53	16	3,188	6	5	130	3,345
Salmon Lake	1	0	40	0	0	0	40
Port Clarence District Total [f]	**214**	**85**	**9,484**	**705**	**1,468**	**4,454**	16,196
Total	**571**	**551**	**10,117**	**5,282**	**8,041**	**13,945**	**37,936**

[a] There were 7 locations where Tier I subsistence permits were issued in 2006 for northern Norton Sound: 1 - Nome Subdistrict; 2 - Cape Woolley; 3 - Golovin Subdistrict; 4 - Moses Point Subdistrict; 5 - Pilgrim River; 6 - Port Clarence District; and 7 - Salmon Lake. Permits fished include those permit holders who fished, but reported no harvest.

[b] There were 329 Nome Subdistrict permits issued and 325 were returned.

[c] All 9 Cape Woolley permits issued were returned.

[d] There were 153 Golovin Subdistrict permits issued and 152 were returned.

[e] All 64 Moses Point Subdistrict permits issued were returned.

[f] All 201 Pilgrim River permits issued were returned, 1 Salmon Lake permit was issued and returned, and all 161 Port Clarence permits issued were returned.

Table 3.–Salmon counts of Norton Sound rivers in 2007 and associated salmon escapement goal ranges (SEG, BEG, or OEG).

	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]	Escapement Goal Range
Salmon L.								
Grand Central R.								
Agiapuk R.								
American R.								
Pilgrim R.	501				35,334			
Glacial L.								
Sinuk R.			3			4,000 - 6,200[b]	7,210	
Cripple R.			1				349	
Penny R.							14	
Snake R.	61		3		8,147	1,600 - 2,500 [c]	1,702	
Nome R.	13		4		7,034	2,900 - 4,300 [c]	1,449	
Flambeau R.			1			4,100 - 6,300 [b]	4,452	
Eldorado R.	14		2		21,312	6,000 - 9,200 [c]	6,315	
Bonanza R.			23			2,300 - 3,400 [b]	2,628	
Solomon R.						1,100 - 1,600 [b]	673	
Fish R.				**Combined**				
Boston Cr.				**100 - 250**				
Niukluk R.	30				50,994	30,000		
Ophir Cr.								
Kwiniuk R.	258	300 - 550	194		27,756	11,500 - 23,000 [d]	2,190	
Tubutulik R.			823			9,200 - 18,400 [b, d]	7,045	
Ungalik R.							9,283	
Inglutalik R								
Pikmiktalik R	123				21,080			
Shaktoolik R.			412	400 - 800			3,531	
Unalakeet R.			642	**Combined**			1,807	**Combined**
Old Woman R.			179	**550 - 1,100**			95	**2,400 - 4,800**
North R.	1,956	1,200 - 2,600	554		7,886		295	

-continued-

Table 3.–Page 2 of 2.

Stream	Coho Salmon			Sockeye Salmon			Pink Salmon		
	Weir/ Tower Count	Aerial Survey Count [a]	Escapement Goal Range	Weir/ Tower Count	Aerial Survey Count [a]	Escapement Goal Range	Weir/ Tower Count	Escapement Goal Range	Aerial Survey Count [a]
Salmon L.					14,920	**Combined**			
Grand Central R.					5,692	**4,000 - 8,000**			
Pilgrim R.	605			43,432			3,616		
Glacial L.				4,533	1,505	800 - 1,600			
Sinuk R.		668							6,810
Cripple R.		258							5,440
Penny R.		84							50
Snake R.	1,781	750		1,354	36		4,634		1,260
Nome R.	2,437	1,442		534	6		24,395	3,150	3,378
Flambeau R.		38							
Eldorado R.	2	34		22			833		318
Bonanza R.									1,360
Solomon R.									2,400
Fish R.									
Boston Cr.									
Niukluk R.	43,617		2,400-5,900				3,498	10,500	
Ophir Cr.									
Kwiniuk R.	9,429	5,174	650-1,300				54,255	8,400	13,400
Tubutulik R.		4,552							32,250
Ungalik R.									60,945
Inglutalik R									
Pikmiktalik R	13,522						21,489		
Shaktoolik R.		1,685							70,227
Unalakeet R.		5,868							65,700
Old Woman R.									2,745
North R.	16,344	2,349	550-1,100				561,364	25,000	50,100

Note: Data not available for all streams.

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

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

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

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

Table 4.–Commercial salmon set gillnet catches from Moses Point, Subdistrict 3, Norton Sound, 2007.

Period	Date	No. of Fishers[a]	Chinook Salmon Catch	Pink Salmon Catch[b]	Pink Salmon Cum. Catch	Chum Salmon Catch	Chum Salmon Cum. Catch	Coho Salmon Catch	Coho Salmon Cum. Catch
1	7/10-7/11	3	1	65	65	789	789	0	0
2	7/13-7/14	3	0	506	571	512	1,301	0	0
3	7/17-7/18	8	0	269	840	1625	2,926	30	30
4	7/20-7/21	6	0	602	1,442	507	3,433	110	140
5	7/24-7/25	6	0	206	1,648	289	3,722	174	314
6	7/28-7/29	6	0		1,648	238	3,960	464	778
7	8/04-8/05	7	0		1,648	46	4,006	952	1,730
8	8/08-8/09	8	0		1,648	94	4,100	1030	2,760
9	8/13-8/14	9	0		1,648	99	4,199	1066	3,826
10	8/16-8/17	9	0		1,648	82	4,281	838	4,664
11	8/19-8/20	9	0		1,648	70	4,351	438	5,102
12	8/21-8/22	9	0		1,648	100	4,451	416	5,518
13	8/24-8/25	6	0		1,648	67	4,518	152	5,670
14	8/28-8/29	7	0		1,648	49	4,567	238	5,908
Total		11	1	1,648		4,567		5,908	

[a] Total number of unique permits fished during the season was 11.

[b] The buyer only purchased pink salmon during the first 5 fishing periods.

Table 5.–Commercial salmon set gillnet catches from Shaktoolik, Subdistrict 5, Norton Sound, 2007.

Period	Date	No. of Fishers[a]	Chinook Salmon Catch	Chum Salmon Catch[b]	Chum Salmon Cum. Catch	Coho Salmon Catch	Coho Salmon Cum. Catch
1	7/18-7/19	7	1	799	799	458	458
2	7/20-7/21	7	0	495	1,294	640	1,098
3	7/22-7/24	8	2	1,167	2,461	2,997	4,095
4	7/25-7/27	9	0	774	3,235	3,512	7,607
5	7/29-7/31	10	2	792	4,027	5,798	13,405
6	8/01-8/02	10	0	135	4,162	3,302	16,707
7	8/05-8/06	6	0		4,162	655	17,362
8	8/07-8/08	12	0	722	4,884	3,755	21,117
9	8/09-8/11	11	0	396	5,280	1,737	22,854
10	8/12-8/14	5	0	163	5,443	1,567	24,421
11	8/15-8/17	13	0	297	5,740	2,654	27,075
12	8/19-8/21	10	0	95	5,835	1,220	28,295
13	8/22-8/24	10	0	88	5,923	476	28,771
14	8/26-8/28	8	0	94	6,017	1,292	30,063
15	8/29-8/31	13	0	59	6,076	1,350	31,413
16	9/02-9/04	6	0	0	6,076	324	31,737
17	9/05-9/07	2	0	0	6,076	73	31,810
Total		15	5	6,076		31,810	

[a] Total number of unique permits fished during the season was 15.

[b] The buyer did not purchase chum salmon caught during period 7.

Table 6.–Commercial salmon set gillnet catches from Unalakleet, Subdistrict 6, Norton Sound, 2007.

			Chinook Salmon		Pink salmon		Chum Salmon		Coho Salmon	
Period	Date	No. of Fishers[a]	Catch	Cum. Catch	Catch[b]	Cum. Catch	Catch[c]	Cum. Catch	Catch	Cum. Catch
1	7/18-7/19	11	3	3	697	697	1,050	1,050	2,596	2,596
2	7/20-7/21	19	1	4	1,424	2,121	953	2,003	1,948	4,544
3	7/22-7/24	19	3	7			1,858	3,861	3,961	8,505
4	7/25-7/27	21	0	7			1,561	5,422	11,667	20,172
5	7/29-7/31	33	1	8			2,371	7,793	18,235	38,407
6	8/01-8/02	29	0	8				7,793	7,508	45,915
7	8/05-8/06	18	1	9			162	7,955	2,269	48,184
8	8/07-8/08	31	0	9			437	8,392	5,827	54,011
9	8/09-8/11	35	0	9			418	8,810	5,937	59,948
10	8/12-8/14	34	1	10			1,252	10,062	10,843	70,791
11	8/15-8/17	35	0	10			542	10,604	5,379	76,170
12	8/19-8/21	34	0	10			281	10,885	2,708	78,878
13	8/22-8/24	27	1	11			123	11,008	1,592	80,470
14	8/26-8/28	24	1	12			282	11,290	3,975	84,445
15	8/29-8/31	21	0	12			181	11,471	2,066	86,511
16	9/02-9/04	21	0	12			197	11,668	1,229	87,740
17	9/05-9/07	11	1	13			120	11,788	657	88,397
Total[d]		47	13		2,121		11,788		88,397	

[a] Total number of unique permits fished during the season was 47.

[b] The buyer only purchased pink salmon the first 2 periods of the season.

[c] The buyer did not purchase chum salmon during period 6.

[d] One sockeye salmon was sold during period 1 and 1 sockeye salmon was sold during period 10.

Table 7.–Commercial salmon set gillnet catches from Port Clarence District, 2007.

Period	Date	No. of Fishers[a]	No. of Landings	Sockeye Salmon Catch	Sockeye Salmon Cum. Catch	Chum Salmon Catch	Chum Salmon Cum. Catch
1	7/08	2	3	70	70	141	141
2	7/10	1	2	78	148	144	285
3	7/11	2	5	189	337	336	621
4	7/12	1	1	89	426	222	843
5	7/14	1	1	74	500	132	975
6	7/15	1	1	118	618	219	1,194
7	7/17	1	1	137	755	253	1,447
8	7/18	1	1	44	799	174	1,621
9	7/20	1	1	53	852	91	1,712
10	7/21	1	1	0	852	190	1,902
11	7/23	1	1	61	913	207	2,109
12	7/25	1	1	60	973	221	2,330
13	7/26	1	2	130	1,103	710	3,040
14	7/28	1	1	49	1,152	143	3,183
Total		3	22	1,152		3,183	

[a] Total number of unique permits fished during the season was 3.

Table 8.–Kotzebue District commercial chum salmon catch and average weight by week, 2007.

Week	Number of Fishers	Chum Salmon Catch	Chum Salmon Pounds	Chum Salmon Average Weight
7/17 - 7/21	21	10,703	84,312	7.9
7/23 - 7/27	27	23,564	198,583	8.4
7/30 - 8/04	34	26,656	228,213	8.6
8/06 - 8/09	33	21,965	181,597	8.3
8/13 - 8/18	32	27,575	224,471	8.1
8/22 - 8/25	27	17,071	133,854	7.8
8/27 - 8/31	26	19,553	158,812	8.1
Total	46	147,087	1,209,842	8.2

Note: Also harvested during the commercial fishery and kept for personal use were 2 chum salmon, 15 Chinook salmon, 3 pink salmon, 2 coho salmon, 960 Dolly Varden, and 13 sheefish.

Table 9.–Historical chum salmon catch for Kobuk River drift test fishery, 1993–2007.

Year	Dates of Operation	Number of Drifts	Cumulative CPUE[a]	Midpoint Date
1993	7/12-8/12	164	494	8/03
1994	7/13-8/16	248	1,207	8/04
1995	7/12-8/16	196	1,188	8/02
1996	7/10-8/14	208	2,581	7/31
1997	7/10-8/14	202	797	8/03
1998	7/10-8/15	182	538	7/29
1999	7/11-8/13	176	1,357	8/02
2000	7/10-8/14	228	1,481	8/01
2001	7/10-8/13	232	1,575	7/26
2002	7/10-8/12	218	875	7/24
2003	7/10-8/13	214	749	8/02
2004	7/10-8/12	242	855	8/05
2005	7/10-8/15	207	1,207	8/06
2006	7/10-8/19	217	743	8/16
2007	7/11-8/20	207	1,342	8/09

[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 10.–Historical Chinook, coho, and chum salmon catches for Unalakleet River set net test fishery, 1985–2007.

		Chinook		Chum		Coho	
Year	Dates of Operation	Total Catch	Midpoint Date	Total Catch	Midpoint Date	Total Catch	Midpoint Date
1985	6/05-9/21	193	7/8	916	7/10	206	8/21
1986	6/17-9/21	52	6/26	1,063	7/23	163	8/18
1987	6/20-9/21	52	7/7	707	7/22	149	8/27
1988	6/20-9/21	15	6/27	662	7/25	216	8/12
1989	6/13-9/21	50	6/19	856	7/11	232	8/16
1990	6/15-9/21	43	6/20	383	7/14	284	8/21
1991	6/10-9/21	36	6/24	834	7/27	177	8/26
1992	6/27-9/21	25	7/12	976	7/12	455	8/12
1993	6/08-9/21	94	6/26	700	7/29	156	8/24
1994	6/16-9/21	35	6/22	949	7/2	297	8/22
1995	6/05-9/21	99	6/20	1,212	7/11	213	8/14
1996	6/05-9/21	138	6/14	1,635	7/6	717	8/06
1997	6/05-9/21	202	6/27	832	7/16	197	8/12
1998	6/05-9/21	110	7/7	535	7/18	220	8/17
1999	6/05-9/21	63	7/8	1,022	7/27	206	8/23
2000	6/05-9/21	61	6/28	1,075	7/18	257	8/16
2001	6/15-9/21	79	7/4	645	7/9	219	8/15
2002	6/05-9/21	44	6/26	852	7/8	394	8/25
2003	6/02-9/21	25	7/2	458	7/30	267	8/24
2004	6/02-9/21	29	7/1	976	7/17	829	8/15
2005	6/04-9/21	78	6/23	1,209	7/10	1080	8/19
2006	6/08-9/21	79	6/30	1,482	7/1	1738	8/16
2007	6/04-9/21	96	6/29	978	7/15	1087	8/06

Table 11.–Commercial herring bait fishery summary by period, Unalakleet Subdistrict, 2007.

Stat Area	Period	Date	Unique Permits	Landings	Pounds	Total Short Tons	Fishery Value[a]
33372	1	6/09	3	5	22,600	11.3	$6,780.00
33372	2	6/10	1	1	2,000	1.0	$600.00
33372	3	6/11	4	4	16,200	8.1	$4,860.00
33372	4	6/12	4	4	9,400	4.7	$2,820.00
33372	5	6/13	2	2	9,200	4.6	$2,760.00
33372	6	6/15	4	5	6,200	3.1	$1,860.00
Totals			7	21	65,600	32.7	$19,620.00

[a] Price per short ton of bait herring was $600 in 2007.

Table 12.–Daily observed peak biomass estimates of Pacific herring, Norton Sound District, 2007.

	Flight	Observer	Survey		Spawn		Estimated Biomass (ST) By Index Area							
Date	**No.**	**Initials[a]**	**Hours**	**Rating[b]**	**No.**	**Length (mi.)**	**KLK**	**UNK**	**CDB**	**NTB**	**ELM**	**GOL**	**NOM**	**TOTAL**
6/6	1	SMK	1.0	3	0	0.0	0.0	711.7	2157.9					2870
6/8	2[c]	WWJ	0.0	0	0	0.0	0.0	0.0	0.0					28,000
Total	2		1.0		0	0.0							Survey	28,000
													Total Harvest	32.7
													Biomass[d]	28,033
													Exploit %	0.12%

Note: Data not available for all index areas.

[a] SMK = Scott Kent, WWJ = Wesley Jones.

[b] Survey rating ranged from 1 = excellent to 5 = poor.

[c] Survey 2 was conducted by NSEDC staff. Biomass estimates for index areas and survey ratings are unavailable.

[d] Biomass includes combined total harvest, waste, and peak survey estimate.

Table 13.–Commercial harvest of red king crab from Norton Sound Section by statistical area, Norton Sound District, 2007.

Statistical Area	Number[a]	Pounds	Pots Pulled	CPUE	Average Weight (lbs)
616401	78	231	20	3.9	3.0
626331	9,819	27,018	758	13.0	2.8
626401	21,984	61,704	2,168	10.1	2.8
636330	3,546	10,253	269	13.2	2.9
636401	43,610	123,092	2,703	16.1	2.8
646330	2,061	5,290	200	10.3	2.6
656300	658	1,909	120	5.5	2.9
656330	1,775	4,911	177	10.0	2.8
656401	23,966	70,065	2,069	11.6	2.9
656402	719	2,254	40	18.0	3.1
666330	188	511	120	1.6	2.7
666401	809	2,498	127	6.4	3.1
666402	1,062	2,959	297	3.6	2.8
676400	69	180	50	1.4	2.6
Total	110,344	312,875	9,118	12.1	2.8

Note: Data for summer fishery only.

[a] Includes 8,672 crabs (23,611 lbs) from the CDQ fishery.

Table 14.–Daily catch for the CDQ summer commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, June 15–28, 2007.

Date[a]	Landings	Number of Crab	Crab Harvested (lbs)	Cumulative Total (lbs)	No. of Pots Pulled	Average Weight (lbs)	CPUE
6/21	1	69	180	180	50	2.6	1.4
6/22	1	77	210	390	18	2.7	4.3
6/23	2	2,177	5,660	6,050	60	2.6	36.3
6/24	2	539	1,517	7,567	80	2.8	6.7
6/25	1	625	1,701	9,268	40	2.7	15.6
6/26	4	2,542	6,804	16,072	138	2.7	18.4
6/27	4	1,913	5,480	21,552	156	2.9	12.3
6/28	2	730	2,059	23,611	80	2.8	9.1
Total	17	8,672	23,611		622	2.7	13.9

Source: Fish ticket data.

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

Table 15.–Length frequencies by shell age of all legal male red king crab sampled during the 2007 Norton Sound summer open access and CDQ commercial fisheries.

Carapace	Legal New Shell Males		Legal Old Shell Males		Total Legal Males	
Length (mm)	Number	Percent	Number	Percent	Number	Percent
101	6	0.1	0	0.0	6	0.1
102	31	0.5	3	0.0	34	0.6
103	31	0.5	2	0.0	33	0.5
104	75	1.2	2	0.0	77	1.3
105	86	1.4	8	0.1	94	1.5
106	163	2.7	8	0.1	171	2.8
107	255	4.2	19	0.3	274	4.5
108	192	3.1	5	0.1	197	3.2
109	250	4.1	15	0.2	265	4.3
110	335	5.5	25	0.4	360	5.9
111	307	5.0	19	0.3	326	5.3
112	342	5.6	31	0.5	373	6.1
113	184	3.0	19	0.3	203	3.3
114	229	3.7	20	0.3	249	4.1
115	250	4.1	21	0.3	271	4.4
116	247	4.0	30	0.5	277	4.5
117	291	4.8	55	0.9	346	5.6
118	162	2.6	17	0.3	179	2.9
119	162	2.6	40	0.7	202	3.3
120	200	3.3	40	0.7	240	3.9
121	239	3.9	47	0.8	286	4.7
122	215	3.5	63	1.0	278	4.5
123	92	1.5	18	0.3	110	1.8
124	111	1.8	23	0.4	134	2.2
125	130	2.1	29	0.5	159	2.6
126	123	2.0	27	0.4	150	2.4
127	122	2.0	28	0.5	150	2.4
128	65	1.1	17	0.3	82	1.3
129	66	1.1	19	0.3	85	1.4
130	78	1.3	14	0.2	92	1.5
131	56	0.9	12	0.2	68	1.1
132	57	0.9	15	0.2	72	1.2
133	34	0.6	2	0.0	36	0.6
134	30	0.5	6	0.1	36	0.6
135	33	0.5	6	0.1	39	0.6
136	41	0.7	6	0.1	47	0.8

-continued-

Table 15.–Page 2 of 2.

Carapace	Legal New Shell Males		Legal Old Shell Males		Total Legal Males	
Length (mm)	Number	Percent	Number	Percent	Number	Percent
137	25	0.4	5	0.1	30	0.5
138	15	0.2	3	0.0	18	0.3
139	9	0.1	2	0.0	11	0.2
140	20	0.3	1	0.0	21	0.3
141	10	0.2	2	0.0	12	0.2
142	10	0.2	2	0.0	12	0.2
143	3	0.0	2	0.0	5	0.1
144	0	0.0	1	0.0	1	0.0
145	4	0.1	0	0.0	4	0.1
146	4	0.1	0	0.0	4	0.1
147	2	0.0	1	0.0	3	0.0
148	0	0.0	0	0.0	0	0.0
149	0	0.0	0	0.0	0	0.0
150	0	0.0	0	0.0	0	0.0
151	0	0.0	0	0.0	0	0.0
152	0	0.0	0	0.0	0	0.0
153	0	0.0	0	0.0	0	0.0
154	0	0.0	0	0.0	0	0.0
155	1	0.0	0	0.0	1	0.0
156	0	0.0	0	0.0	0	0.0
157	0	0.0	0	0.0	0	0.0
158	0	0.0	0	0.0	0	0.0
159	0	0.0	0	0.0	0	0.0
160	0	0.0	0	0.0	0	0.0
161	0	0.0	0	0.0	0	0.0
162	1	0.0	0	0.0	1	0.0
163	0	0.0	0	0.0	0	0.0
164	0	0.0	0	0.0	0	0.0
165	0	0.0	0	0.0	0	0.0
166	0	0.0	0	0.0	0	0.0
167	0	0.0	0	0.0	0	0.0
168	0	0.0	0	0.0	0	0.0
169	0	0.0	1	0.0	1	0.0
170	0	0.0	0	0.0	0	0.0
171	0	0.0	0	0.0	0	0.0
Totals	5,394	88.1	731	11.9	6,125	100.0
Average Lengths	116.6		120.1		117.0	
				Total Recruits <116 mm =	2,736	44.7%
			Total Postrecruits ≥ 116 mm and all legal old shell males =		3,389	55.3%

Table 16.–Winter 2006–2007 subsistence red king crab catches and effort by gear type, Norton Sound District.

Gear Type	Permits Fished[a]	Total Caught	Males Kept	Females Kept	Total Kept	Average Harvest/ Fisher
Pots	100	21,331	10,376	219	10,595	106
Handlines	9	23	23	0	23	3
Both	7	90	72	0	72	10
Totals	116	21,444	10,471	219	10,690	92

[a] Number of permits given out was 129, and number of permits returned was 127.

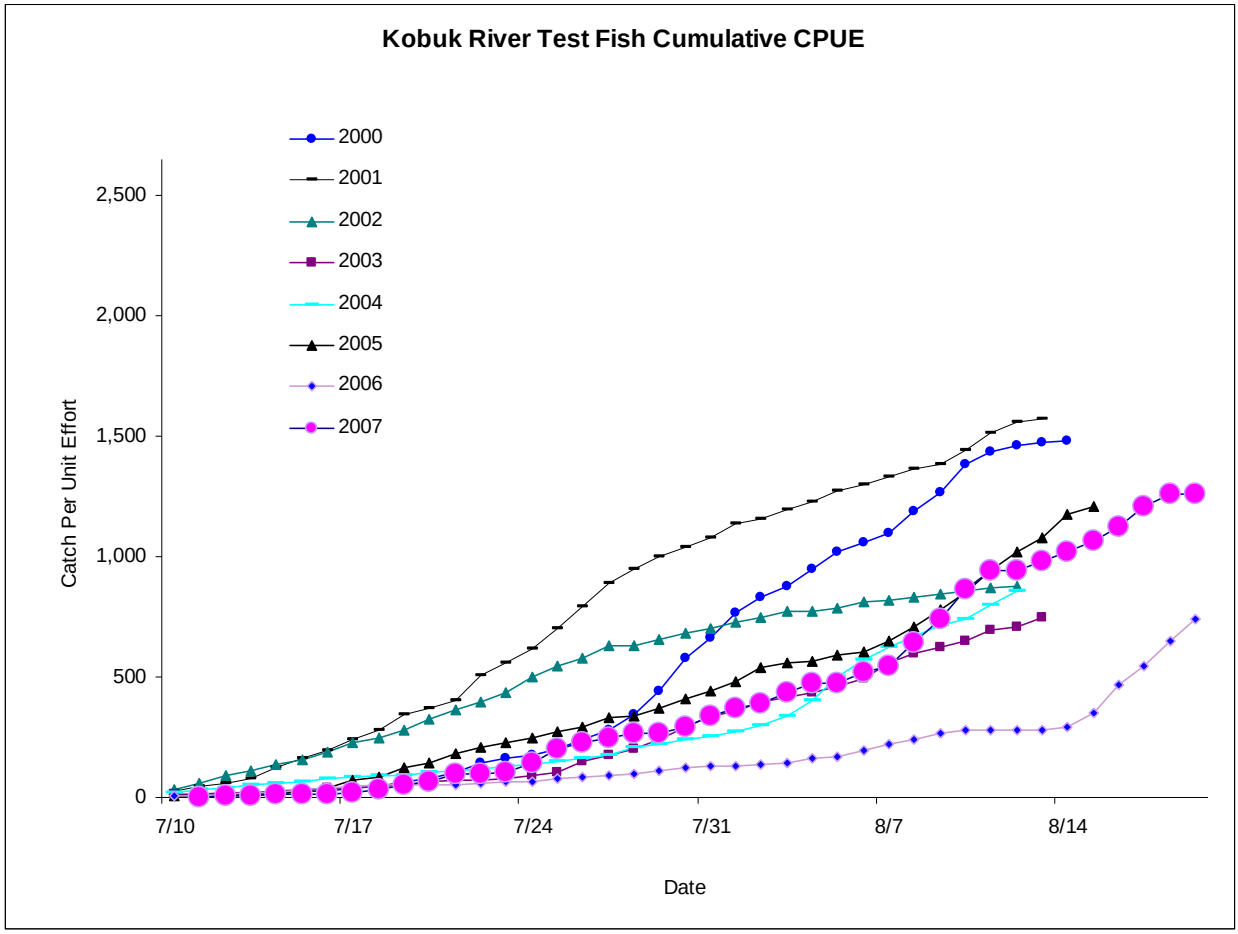


Figure 10.–Kobuk River chum salmon drift test fish cumulative Catch Per Unit Effort (CPUE), 2000–2007.

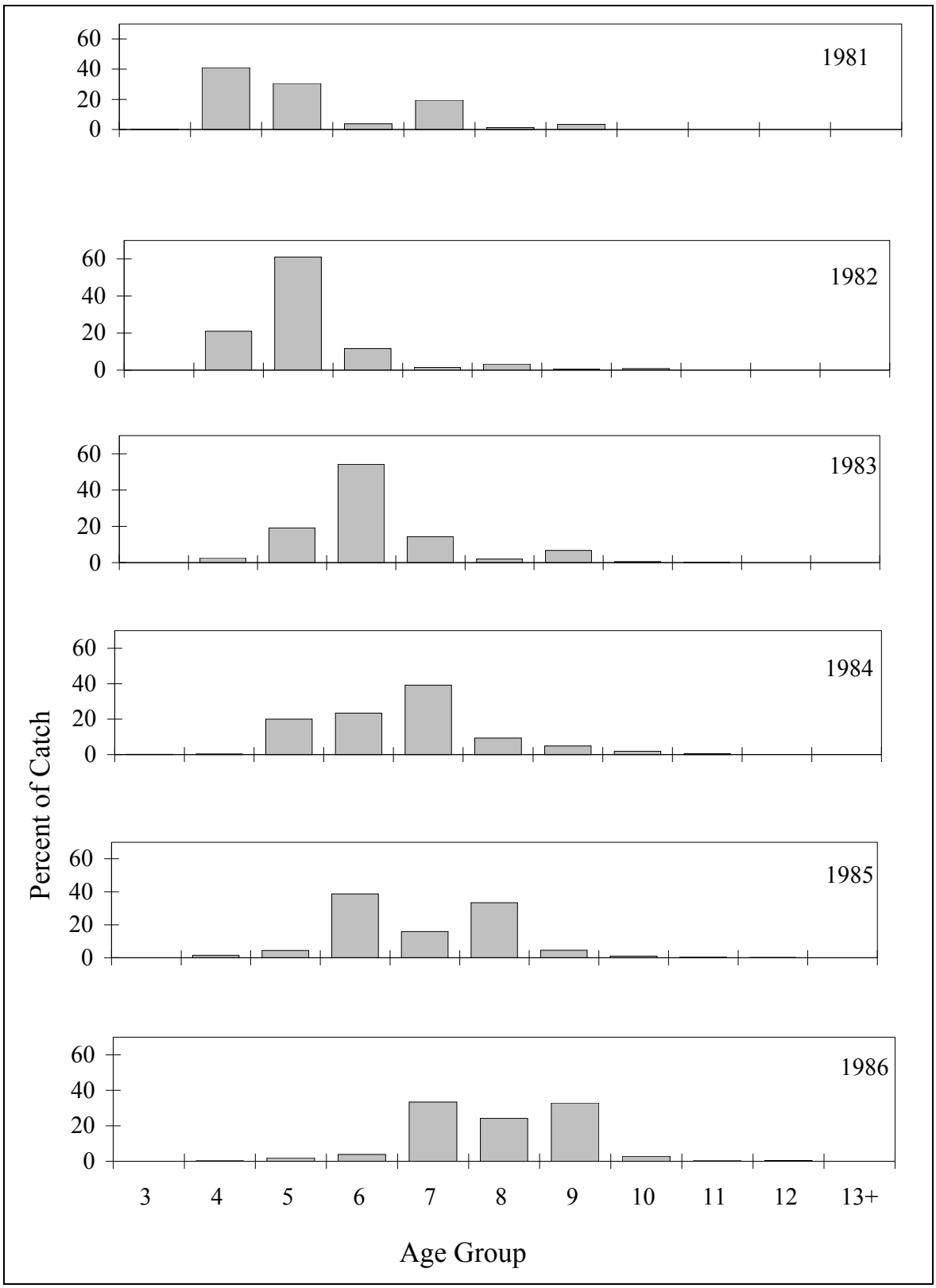
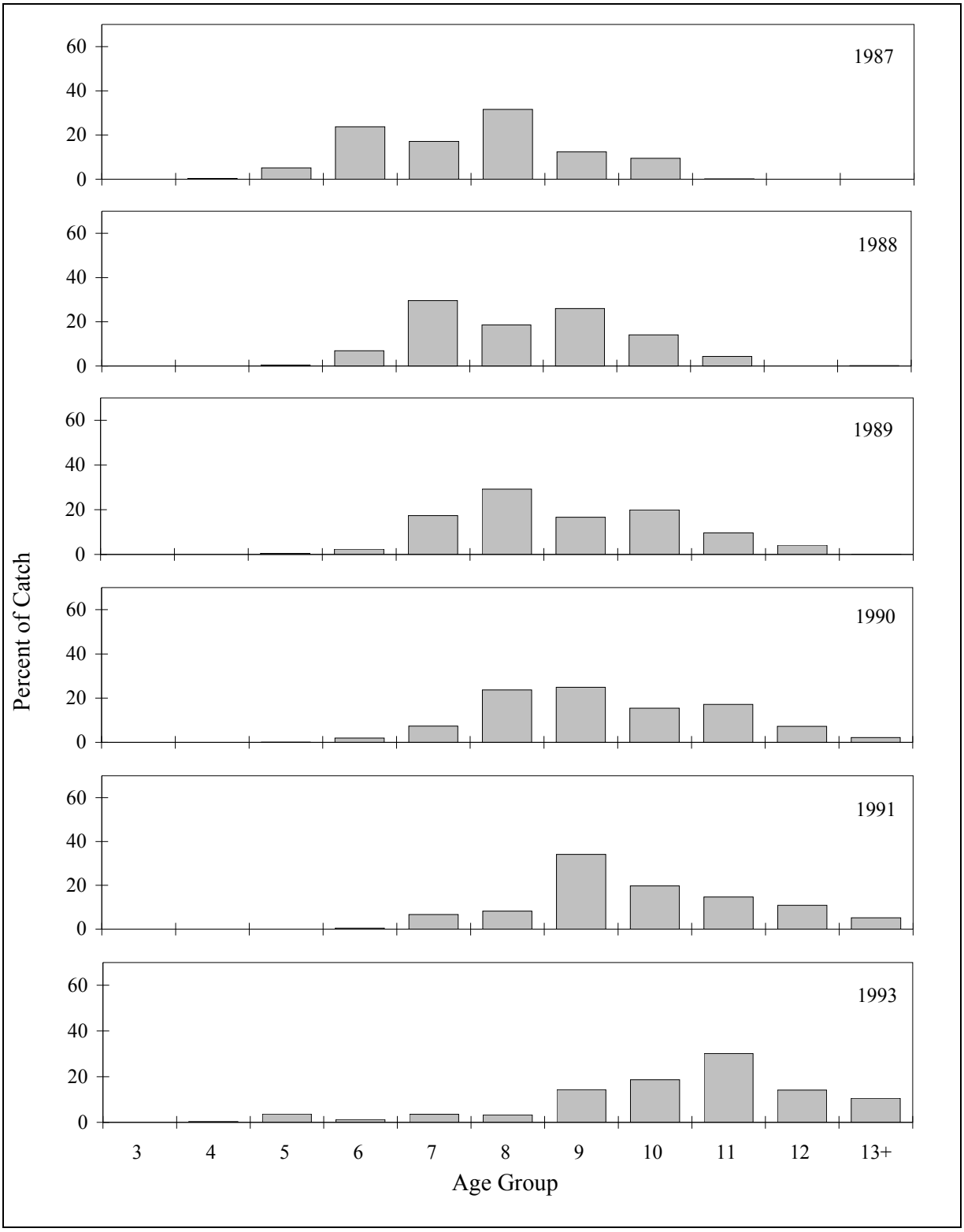


Figure 11.–Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1981–1986.



Note: No commercial fishing occurred in 1982.

Figure 12.–Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1987–1993.

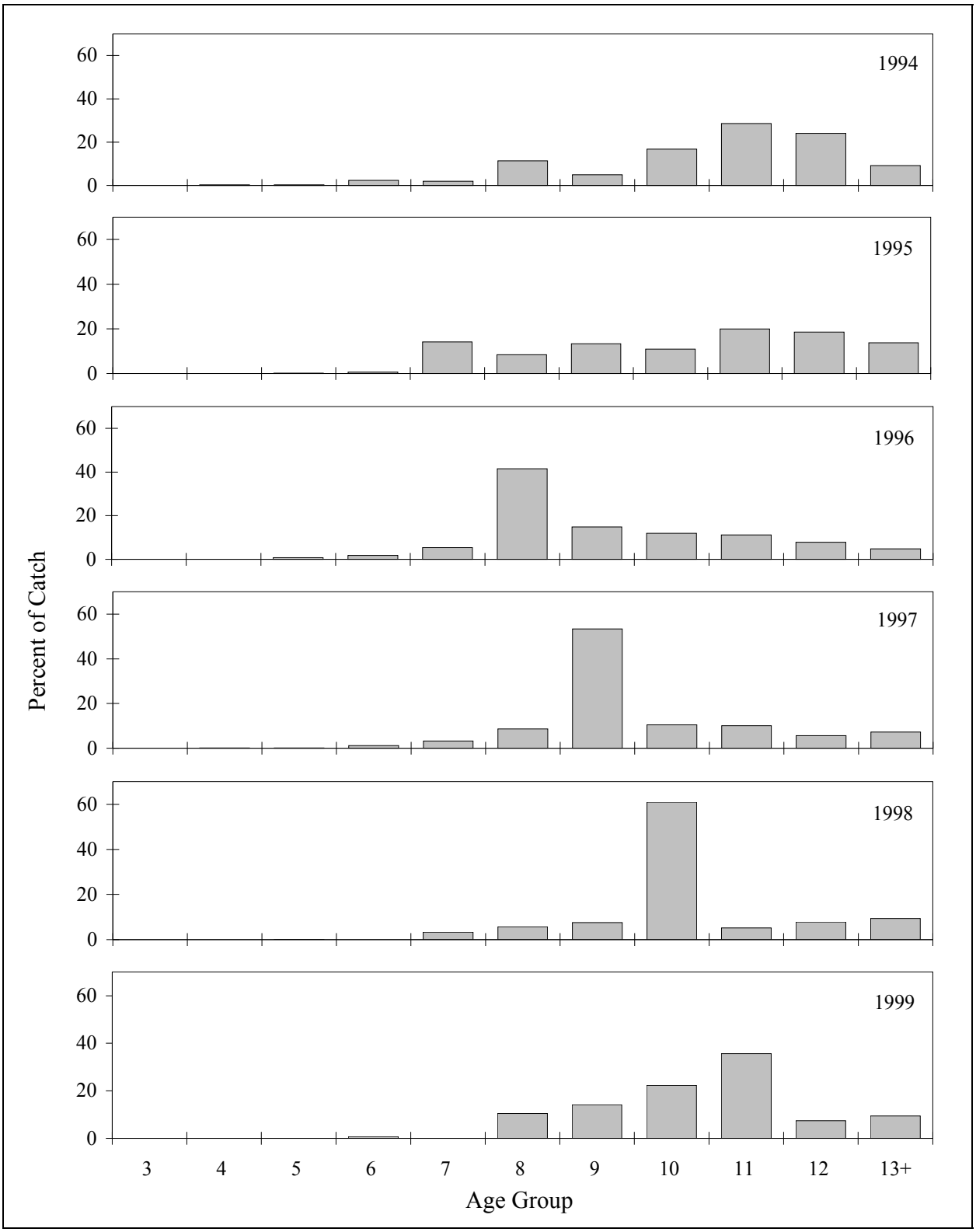
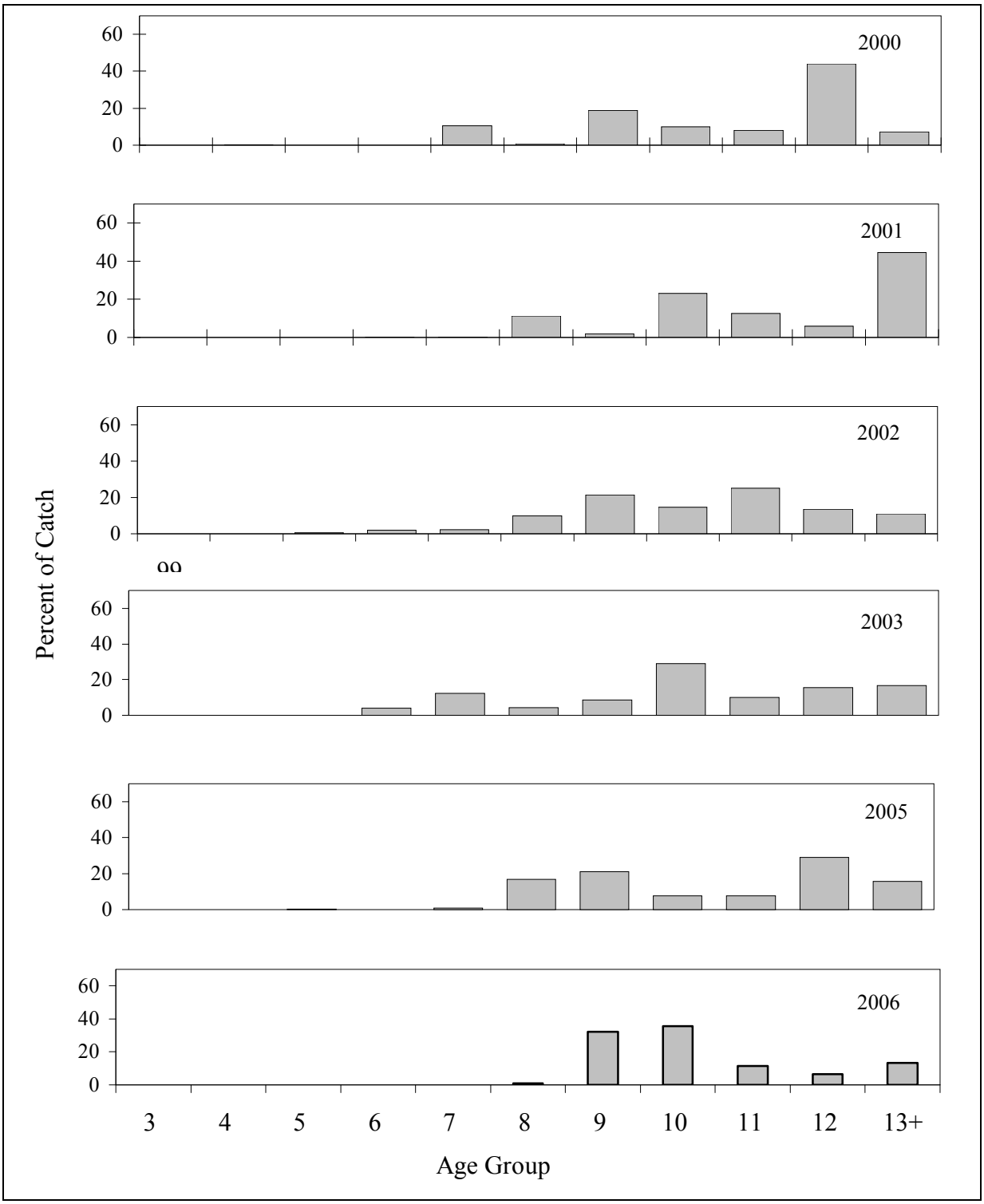


Figure 13.–Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1994–1999.



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

Figure 14.–Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 2000–2006.

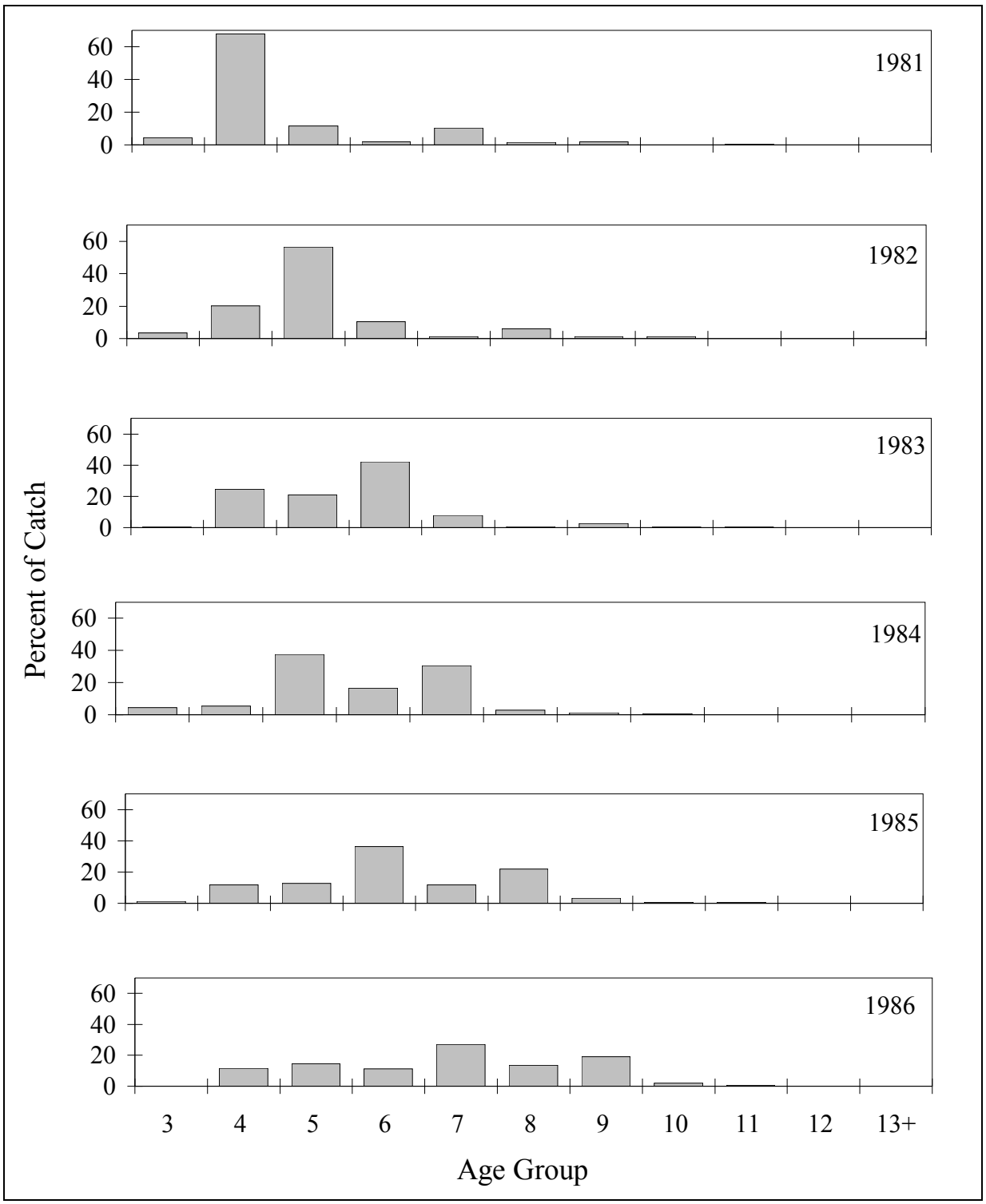


Figure 15.–Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1981–1986.

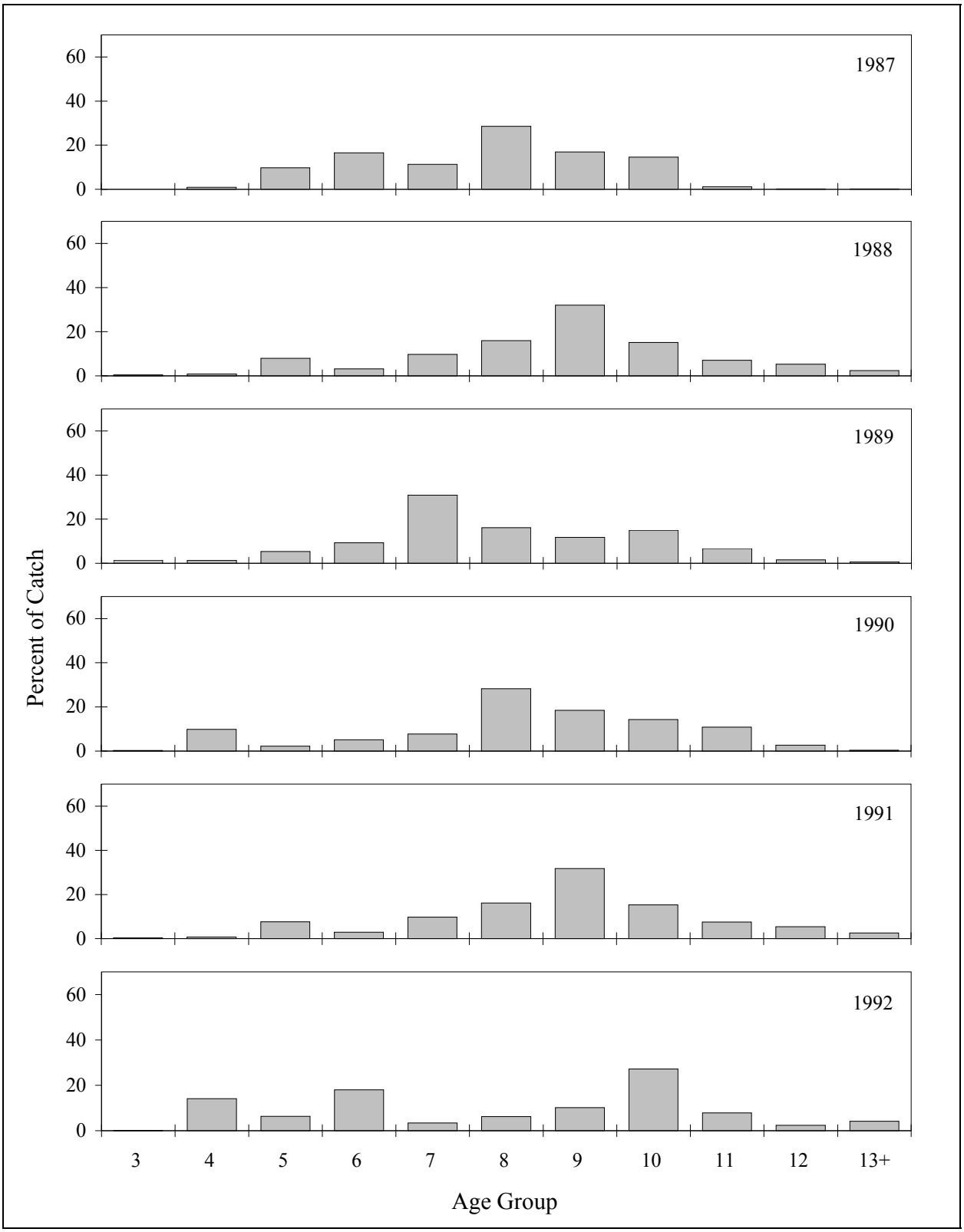


Figure 16.–Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1987–1992.

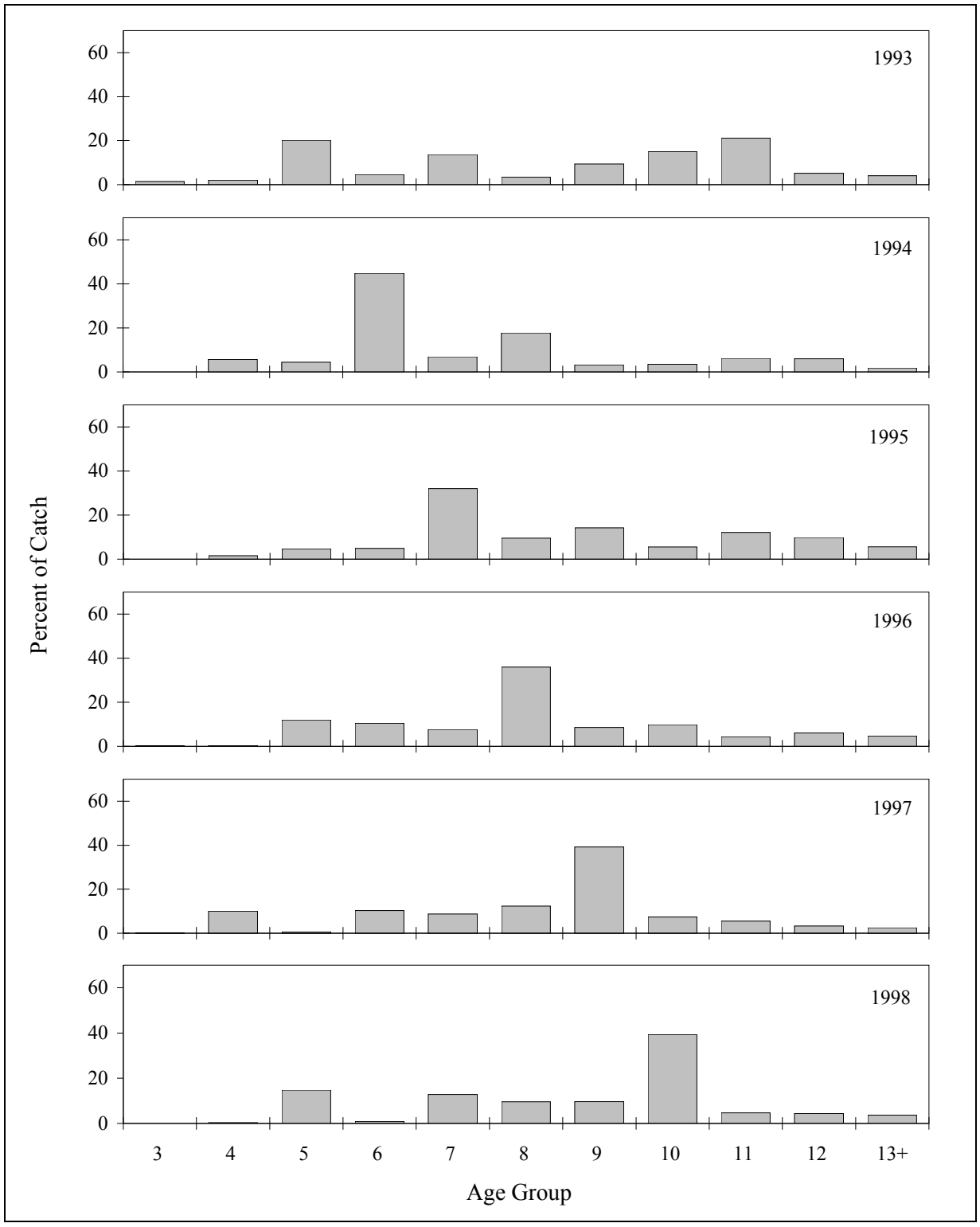


Figure 17.–Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1993–1998.

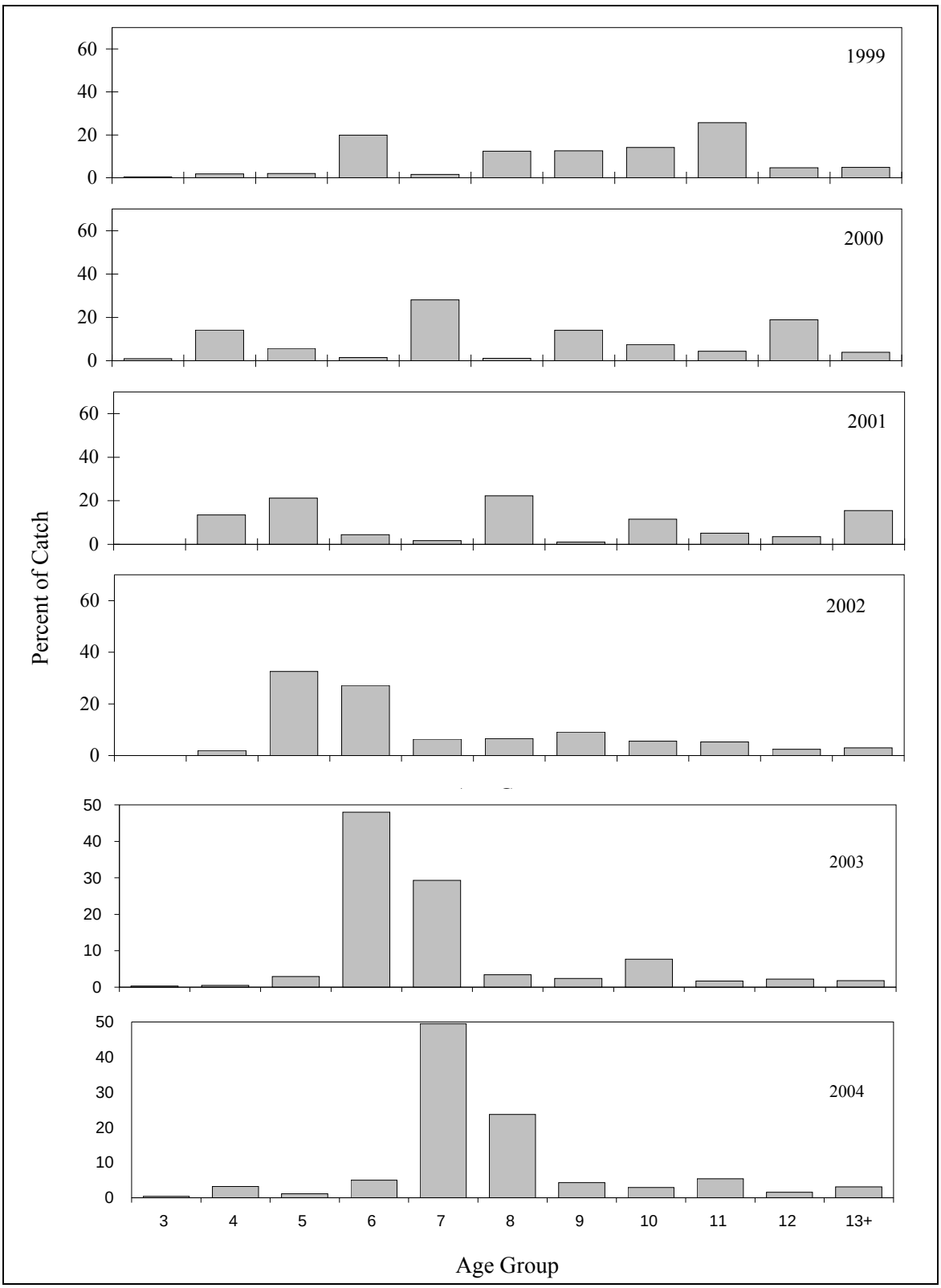


Figure 18.–Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1999–2004.

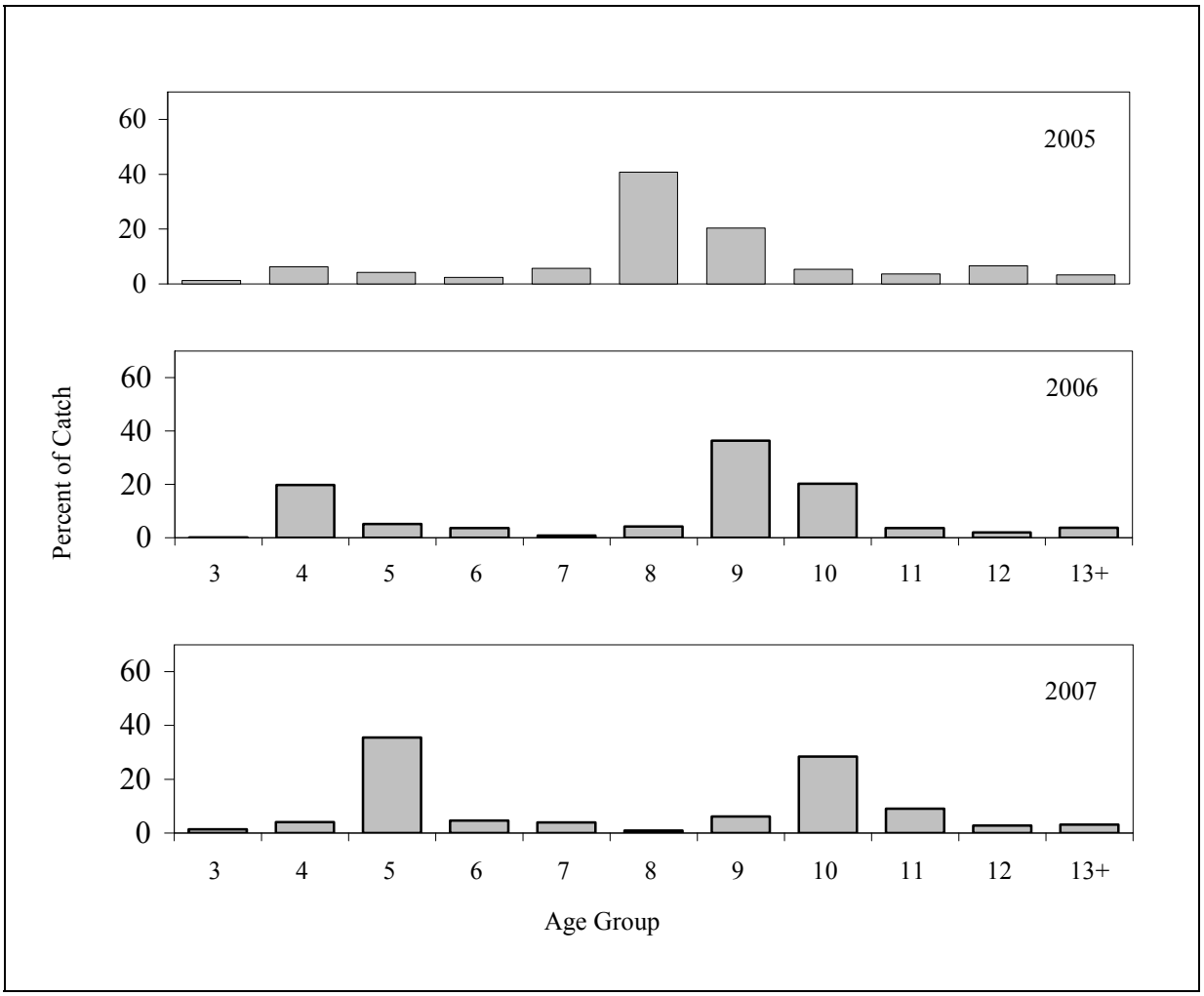


Figure 19.–Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 2005–2007.

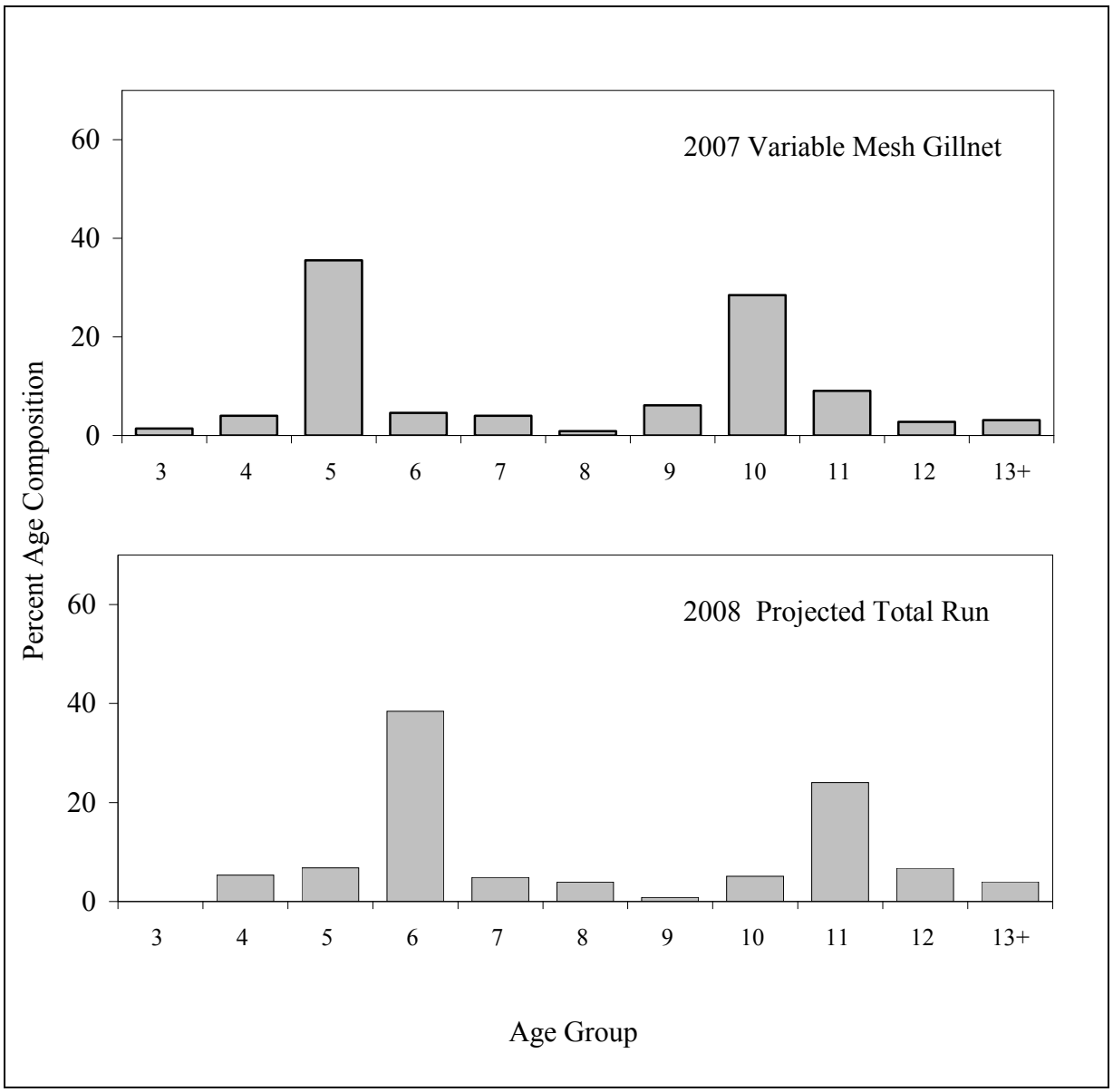
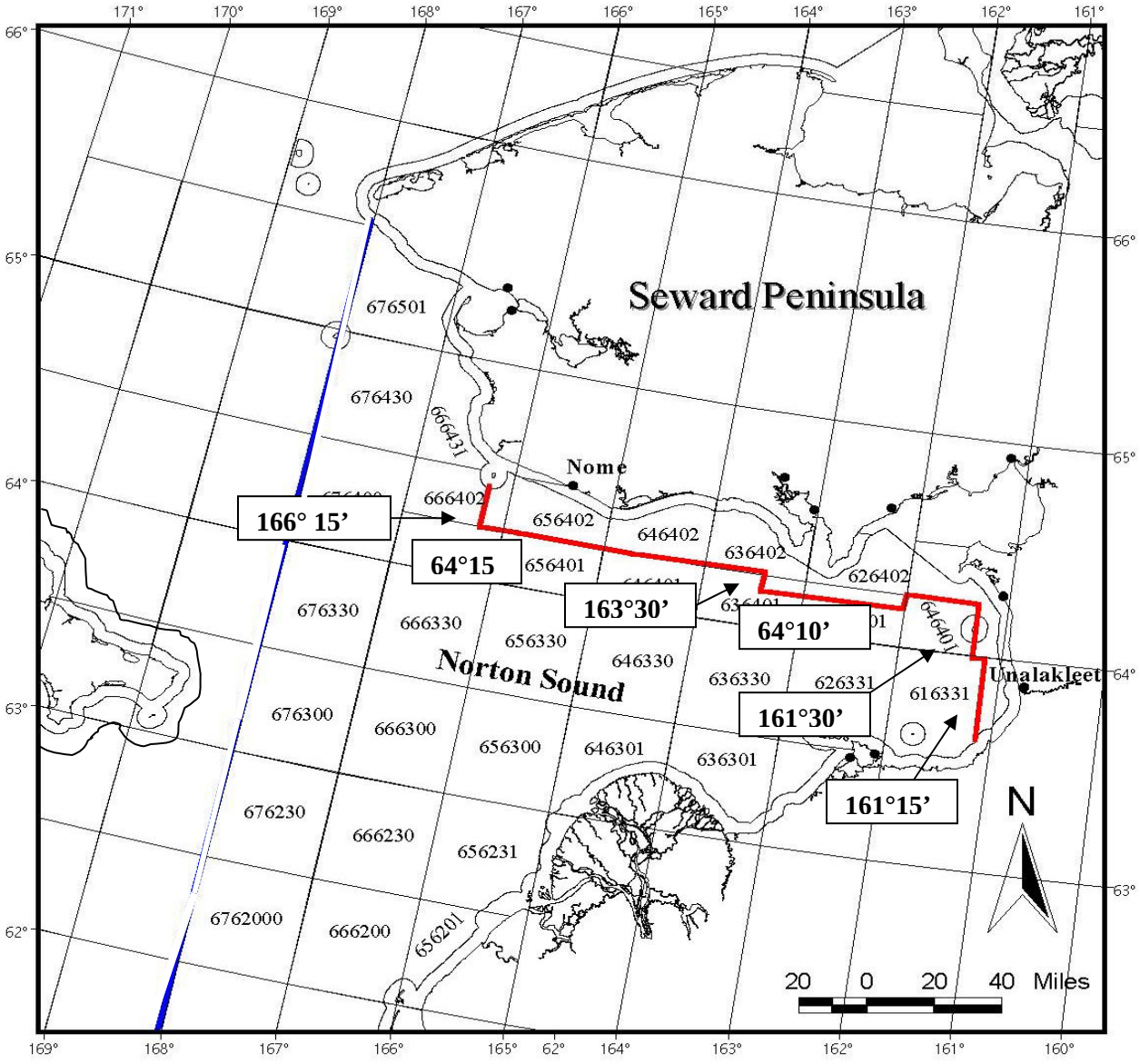


Figure 20.–Norton Sound Pacific herring age composition comparison of the 2007 variable mesh gear, and the projected age composition of the 2008 return.



Note: Line drawn around the coastline delineates the 3-mile state waters zone, and outer line around St. Lawrence Island shows the 10-mile closure zone.

Figure 21.–Closed water regulations in effect for the Norton Sound summer commercial crab fishery.

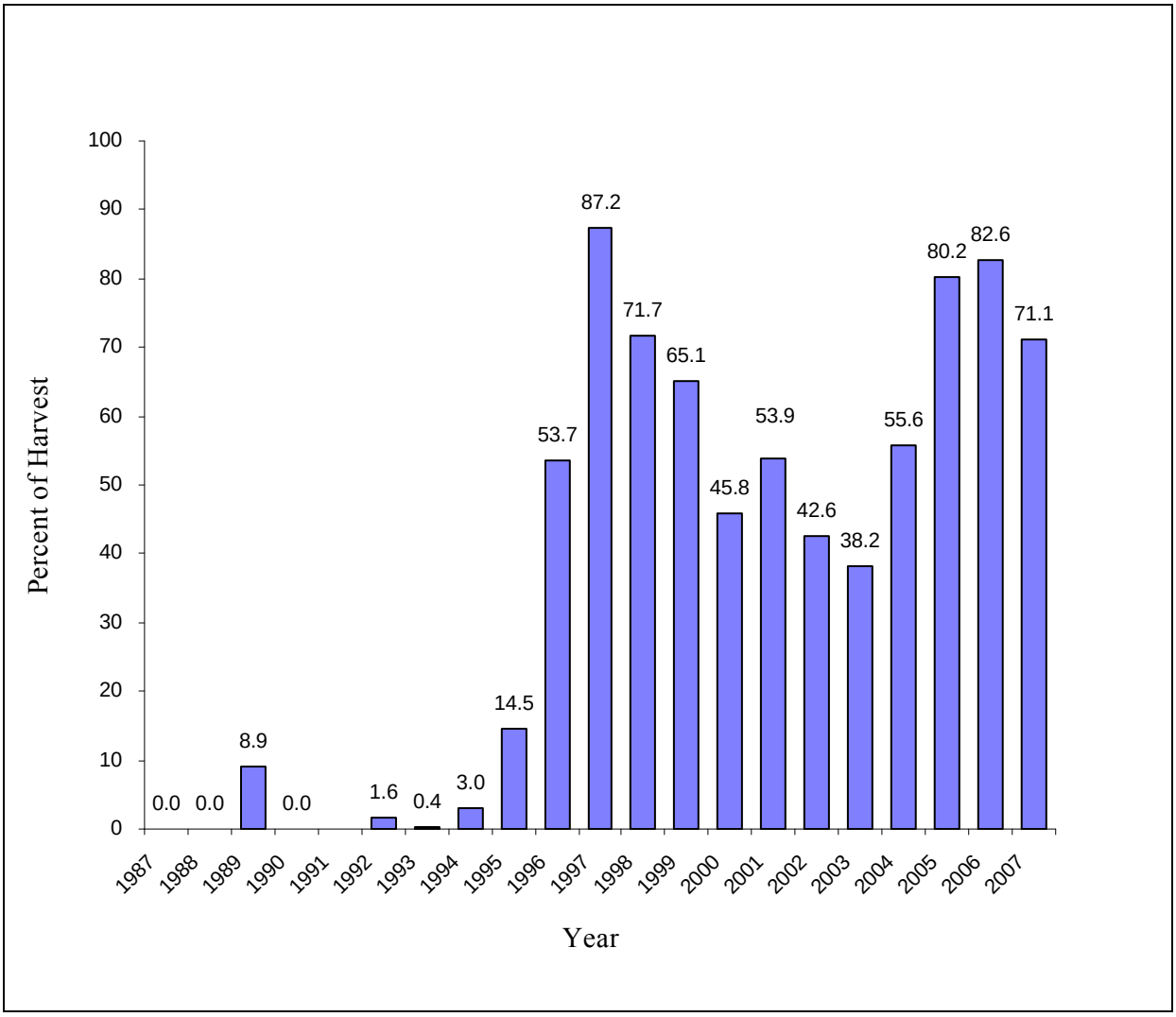


Figure 22.–The percent of crab harvested during the Norton Sound summer commercial red king crab fishery east of 164º west longitude, 1987–2007.

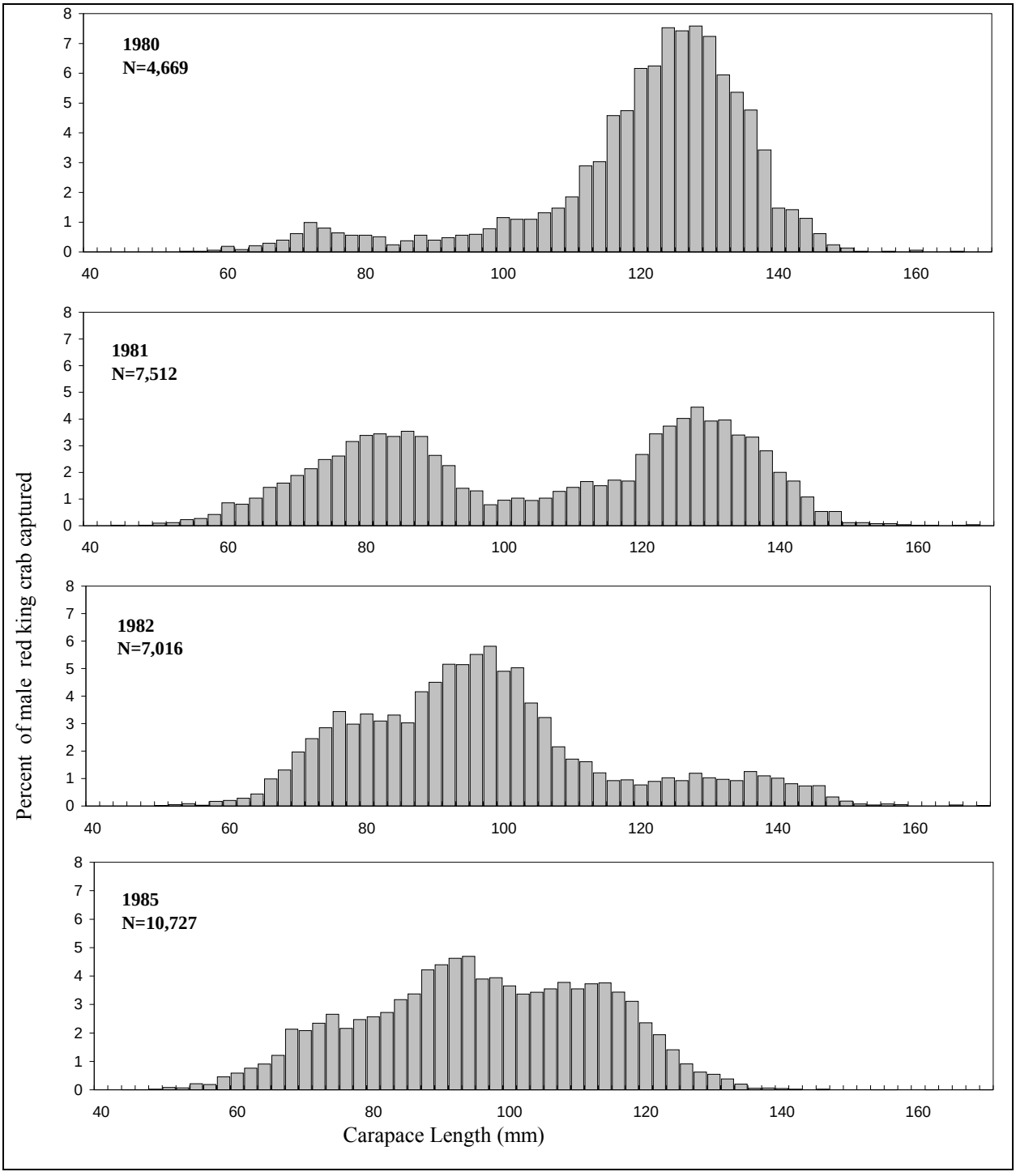


Figure 23.–Norton Sound male red king crab size distribution from pot assessment surveys conducted by ADF&G in 1980, 1981, 1982, and 1985.

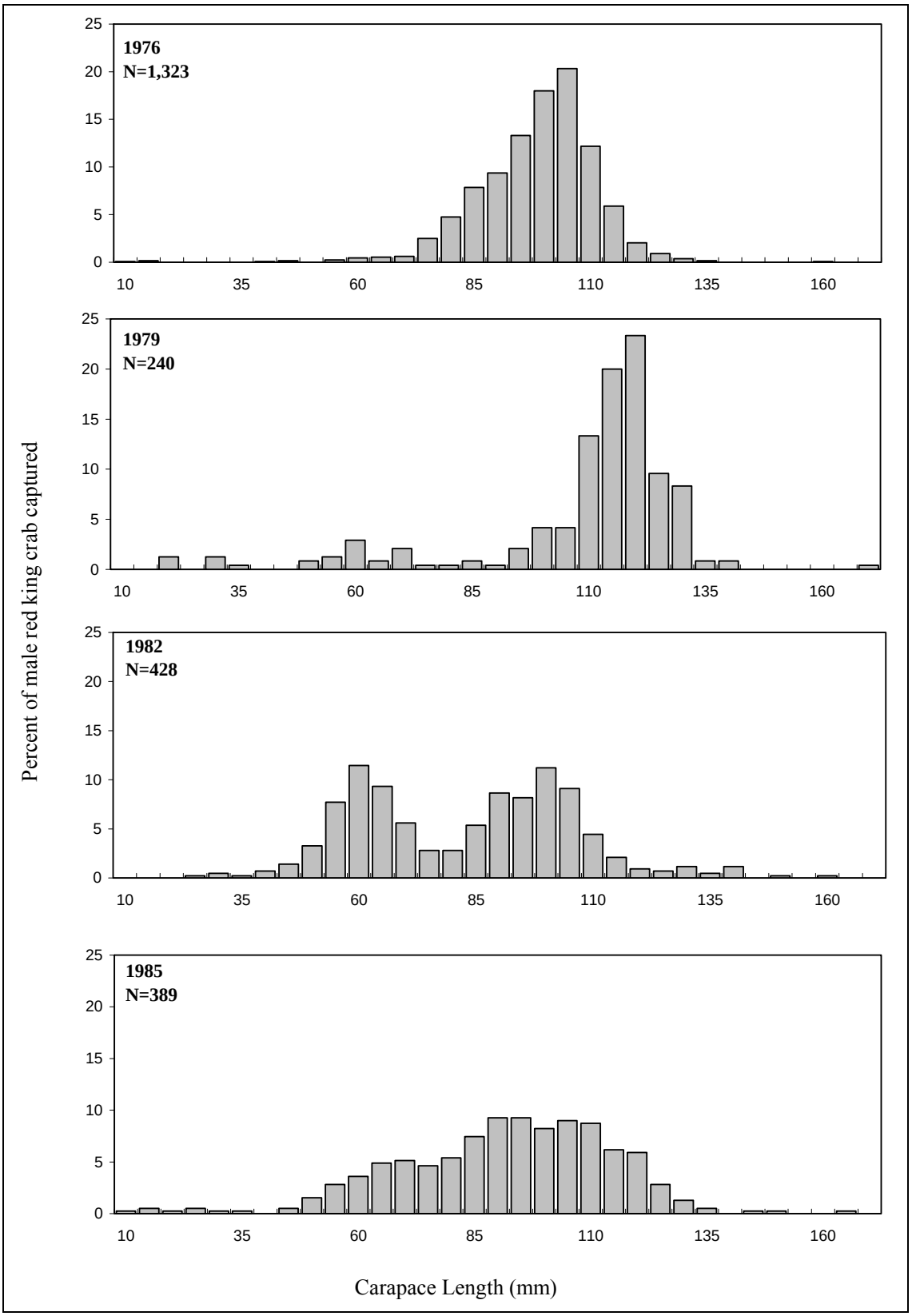


Figure 24.–Norton Sound male red king crab size distribution from trawl assessment surveys conducted by the National Marine Fisheries Service, 1976, 1979, 1982, and 1985.

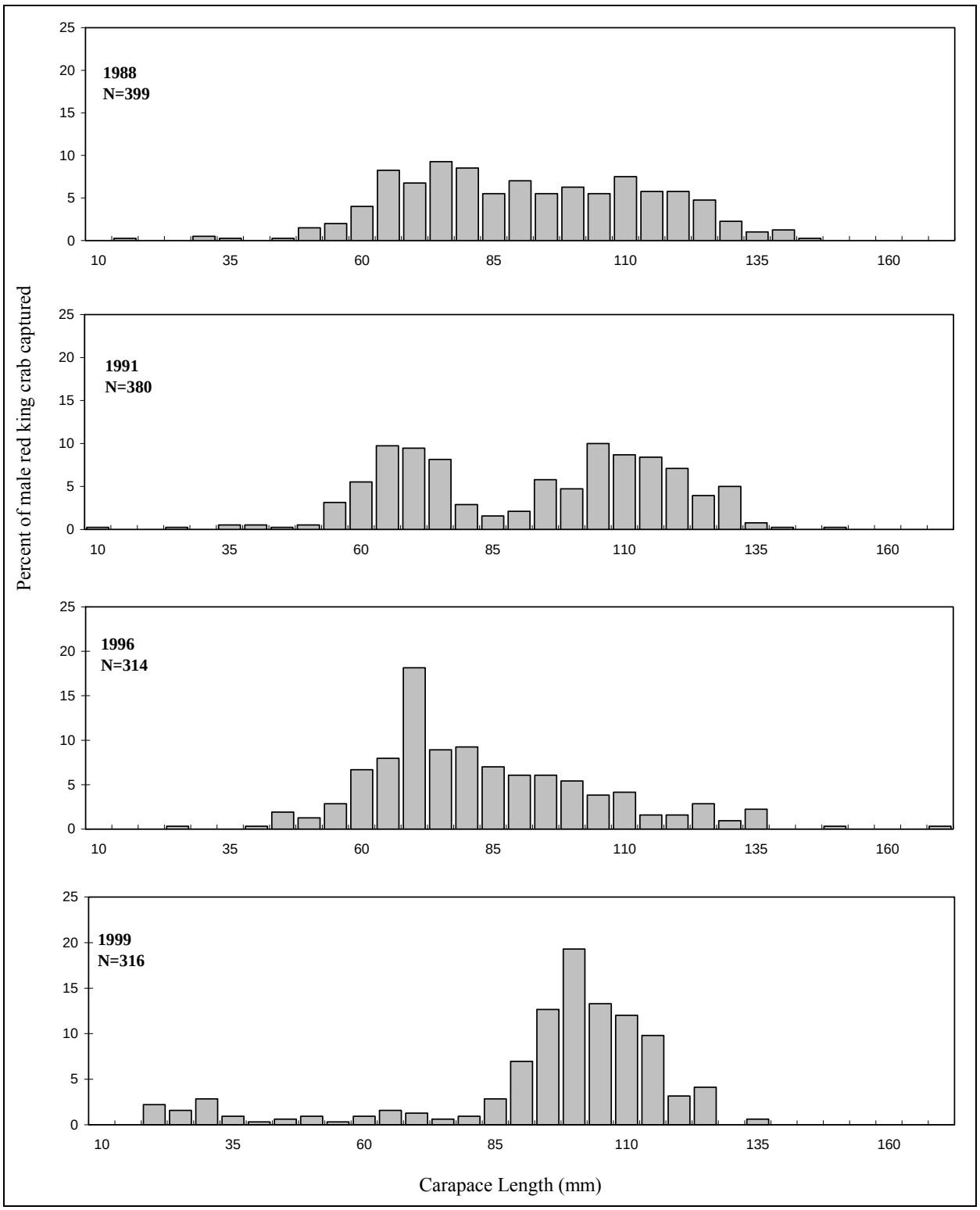


Figure 25.–Norton Sound male red king crab size distribution from trawl assessment surveys conducted by the National Marine Fisheries Service in 1988 and 1991, and by ADF&G in 1996 and 1999.

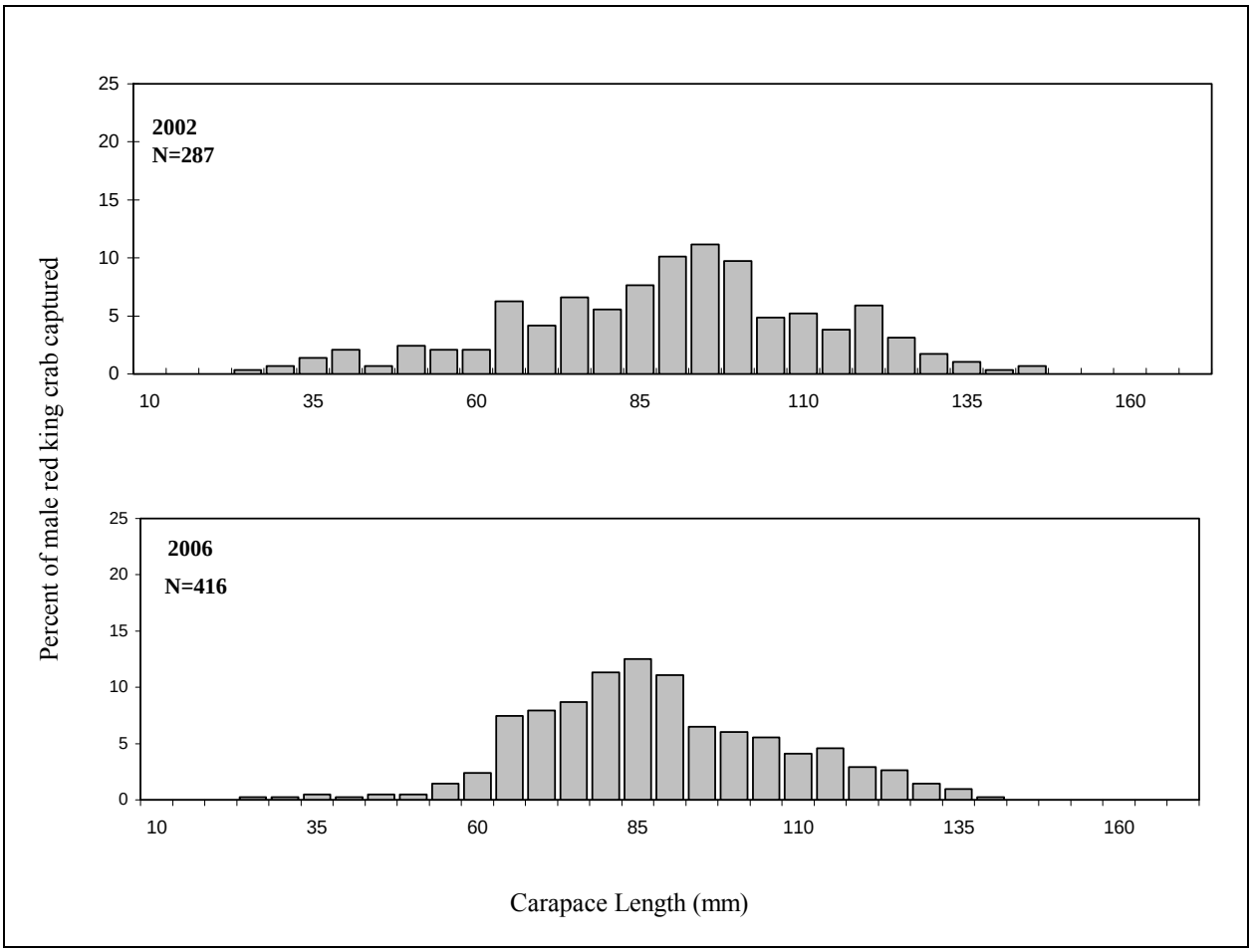


Figure 26.–Norton Sound male red king crab size distribution from trawl assessment surveys conducted by ADF&G in 2002 and 2006.

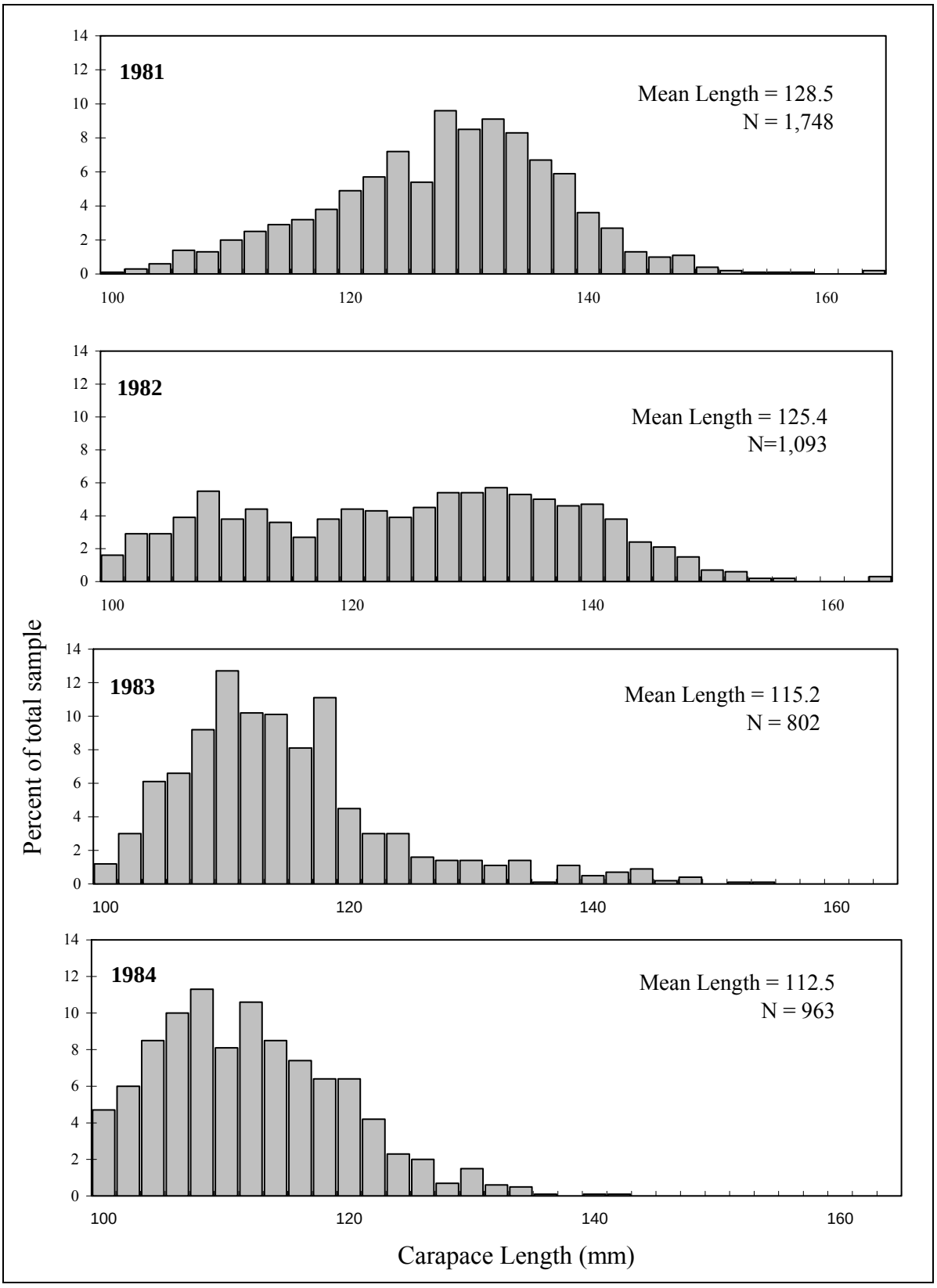


Figure 27.–Length composition of Norton Sound red king crab summer commercial harvests, 1981–1984.

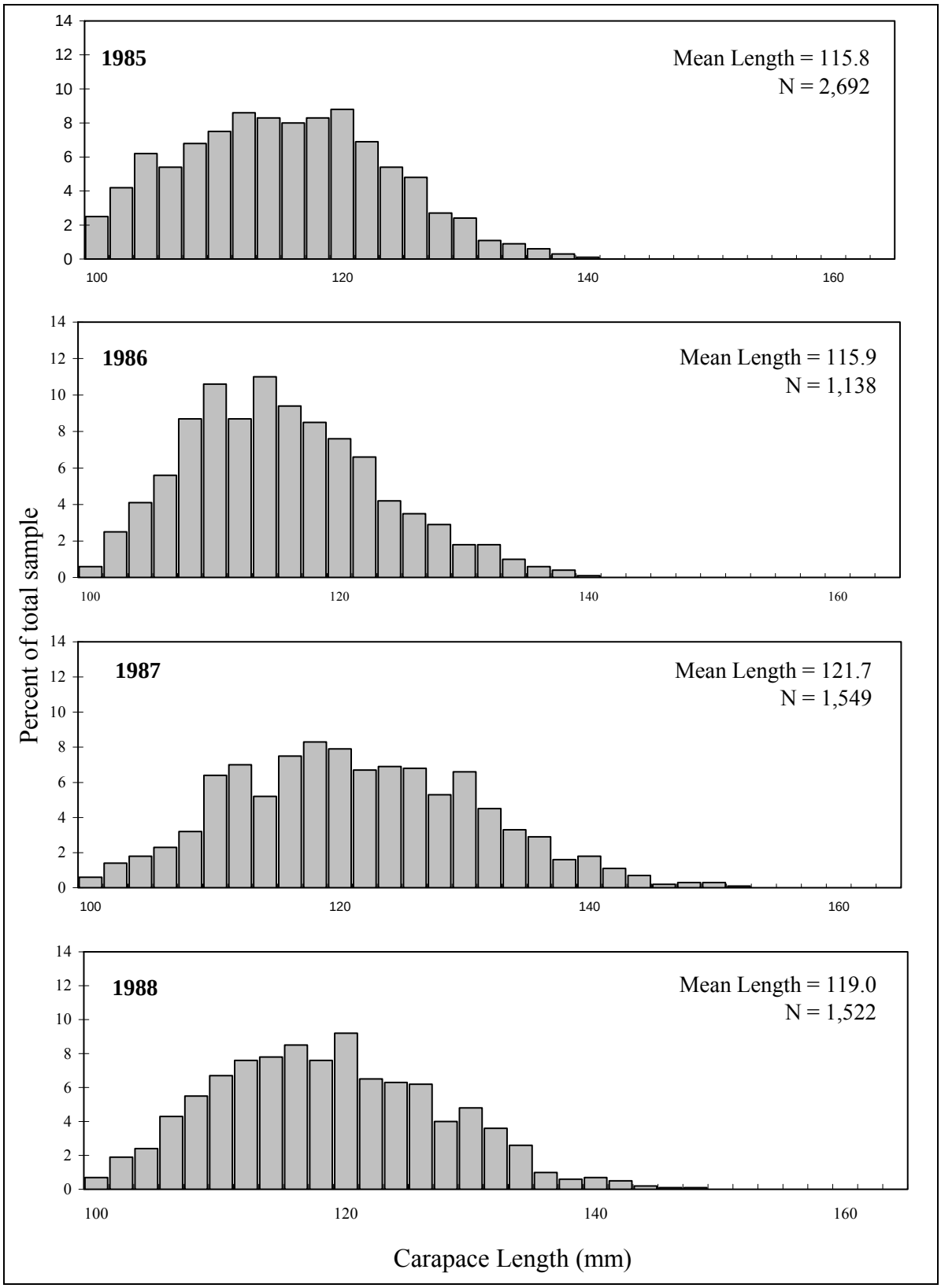
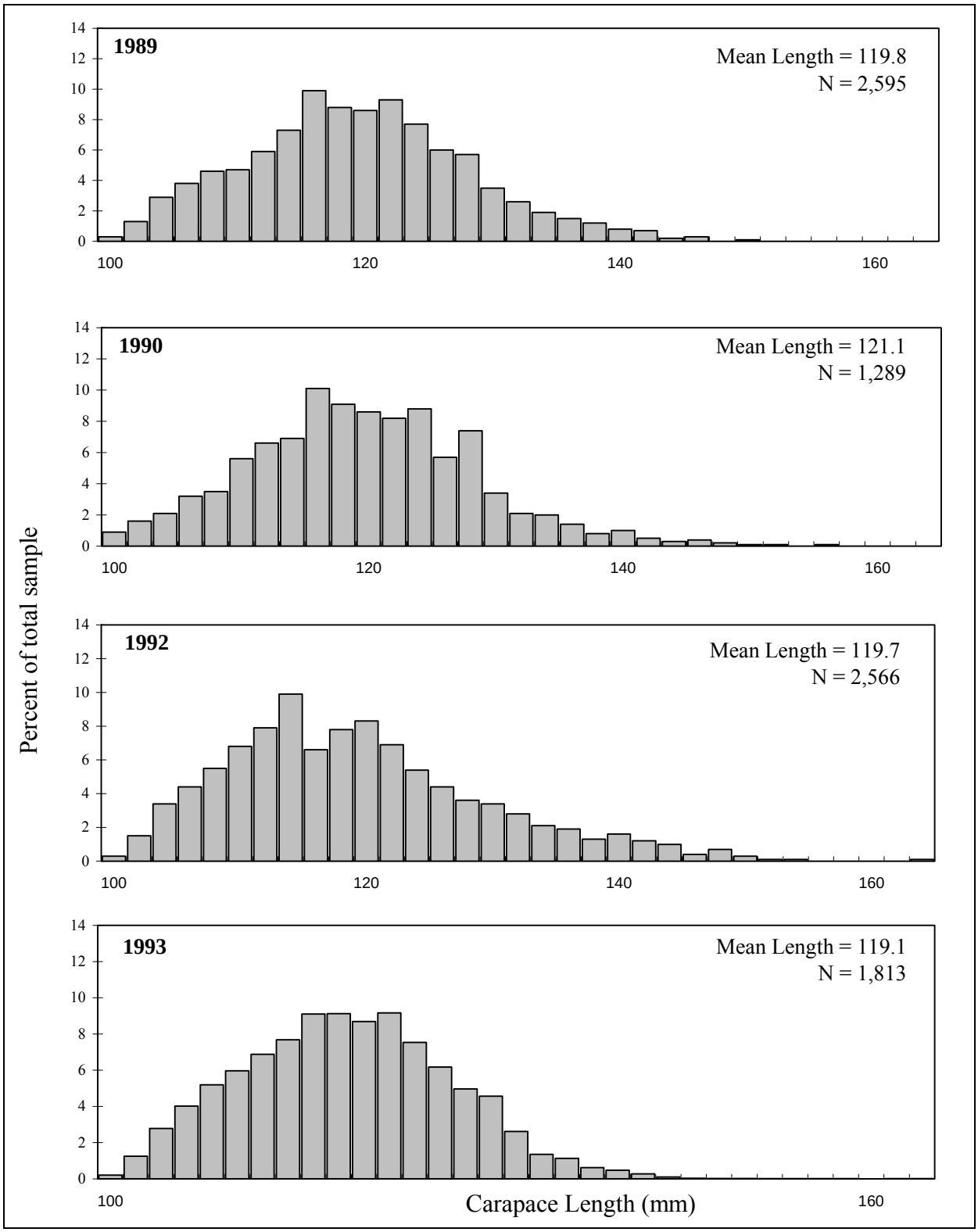


Figure 28.–Length composition of Norton Sound red king crab summer commercial harvests, 1985–1988.



Note: No fishery in 1991.

Figure 29.–Length composition of Norton Sound red king crab summer commercial harvests, 1989–1993.

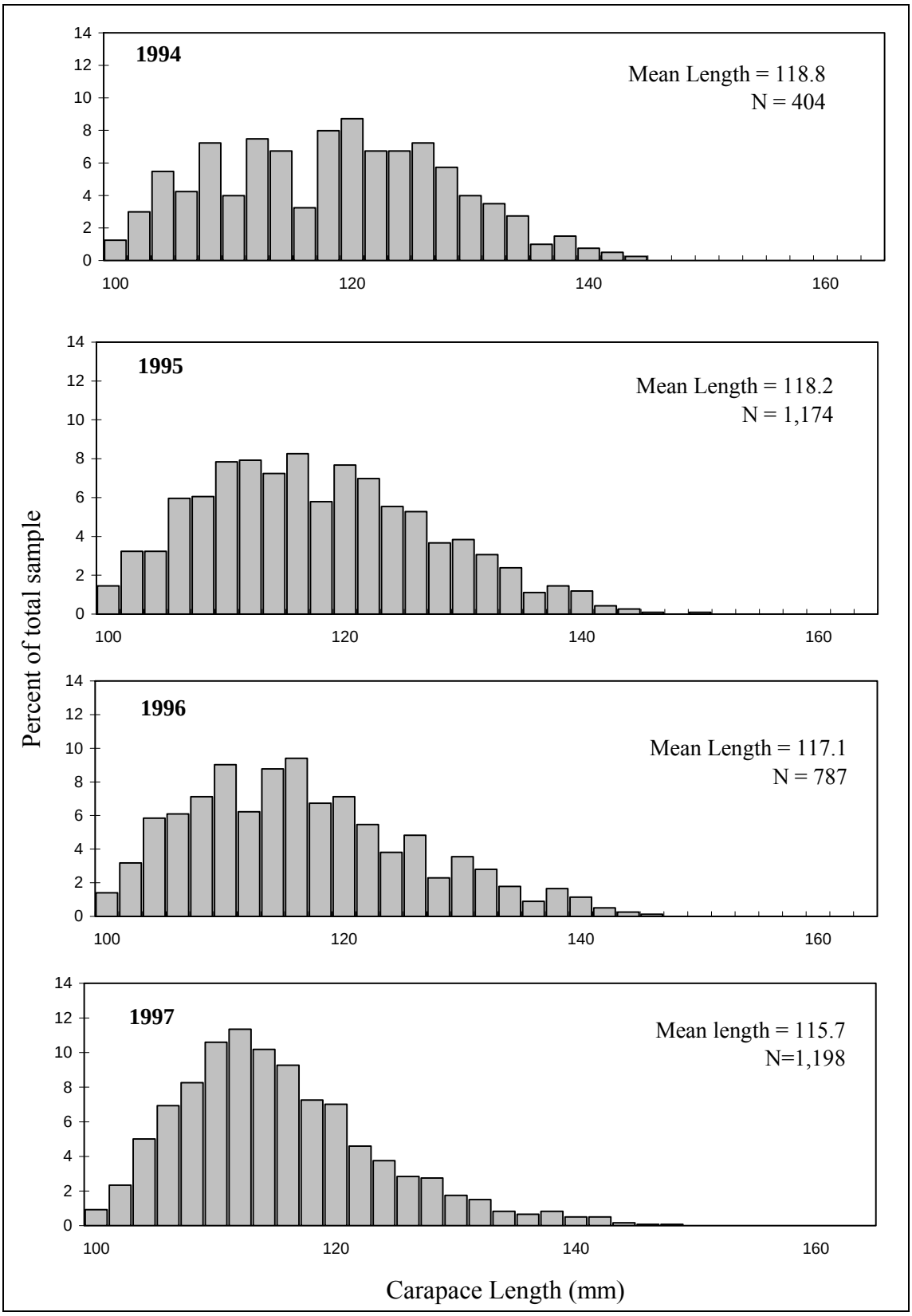


Figure 30.–Length composition of Norton Sound red king crab summer commercial harvests, 1994–1997.

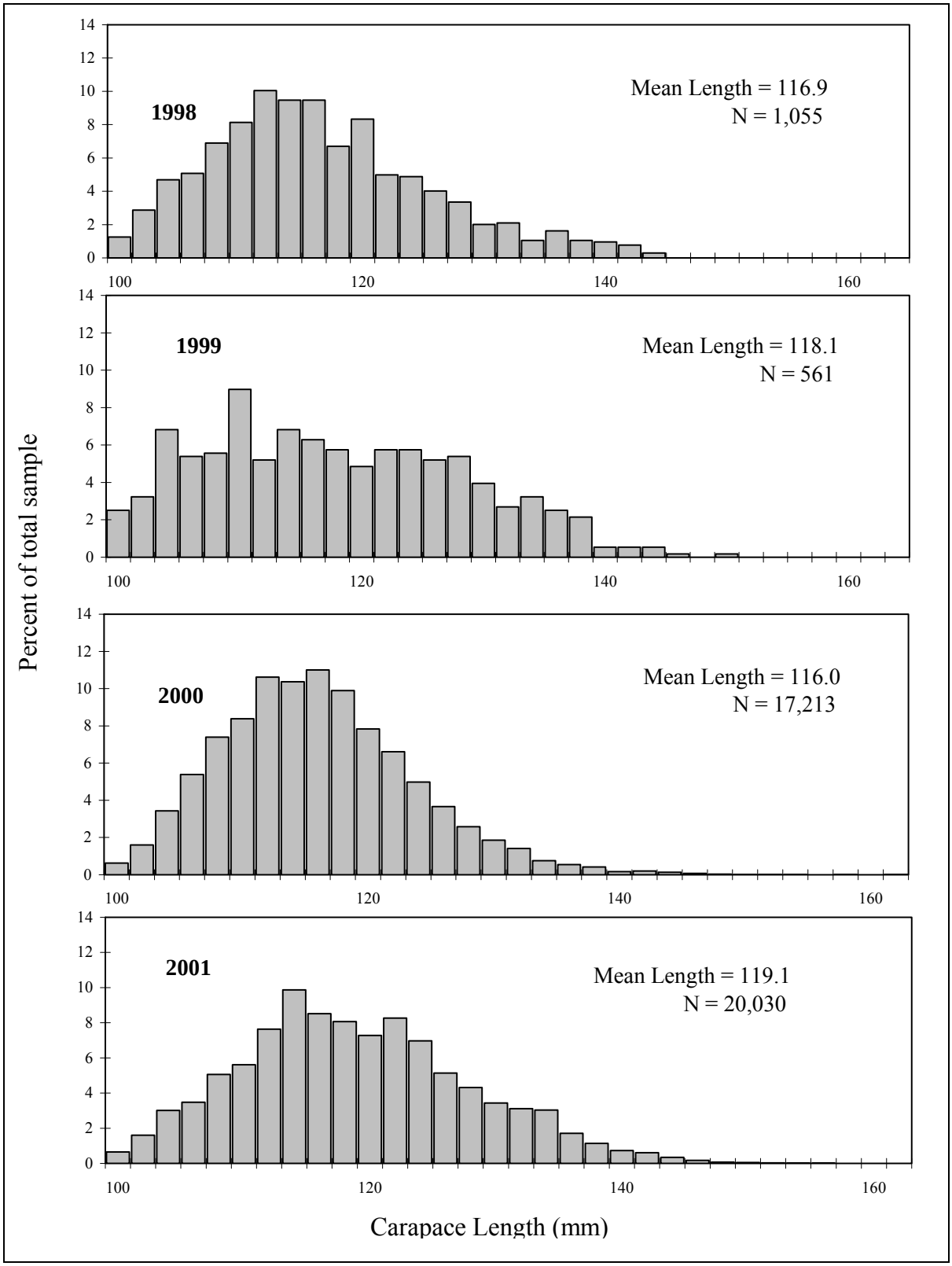


Figure 31.–Length composition of Norton Sound red king crab summer commercial harvests, 1998–2001.

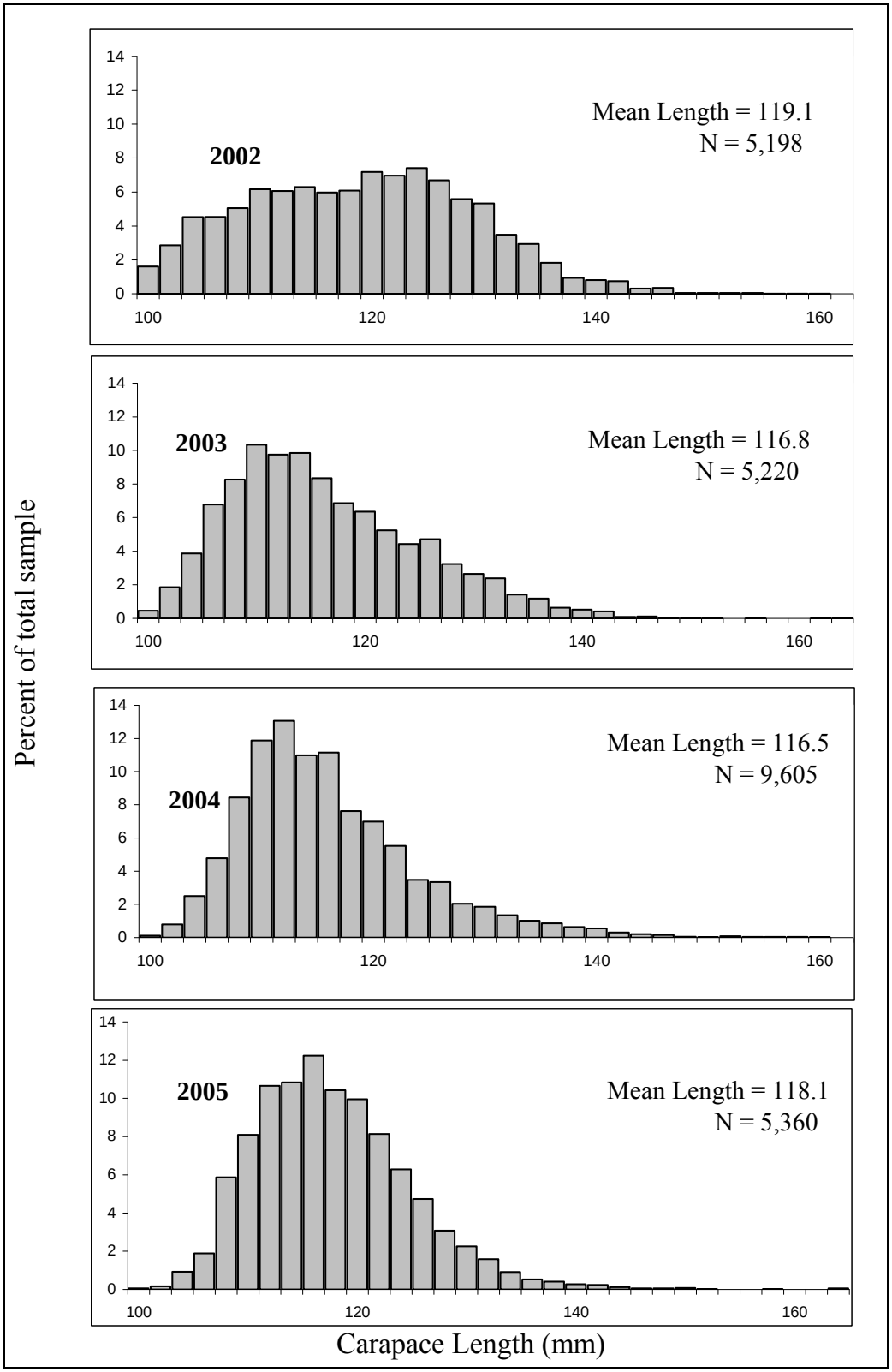


Figure 32.–Length composition of Norton Sound red king crab summer commercial harvests, 2002–2005.

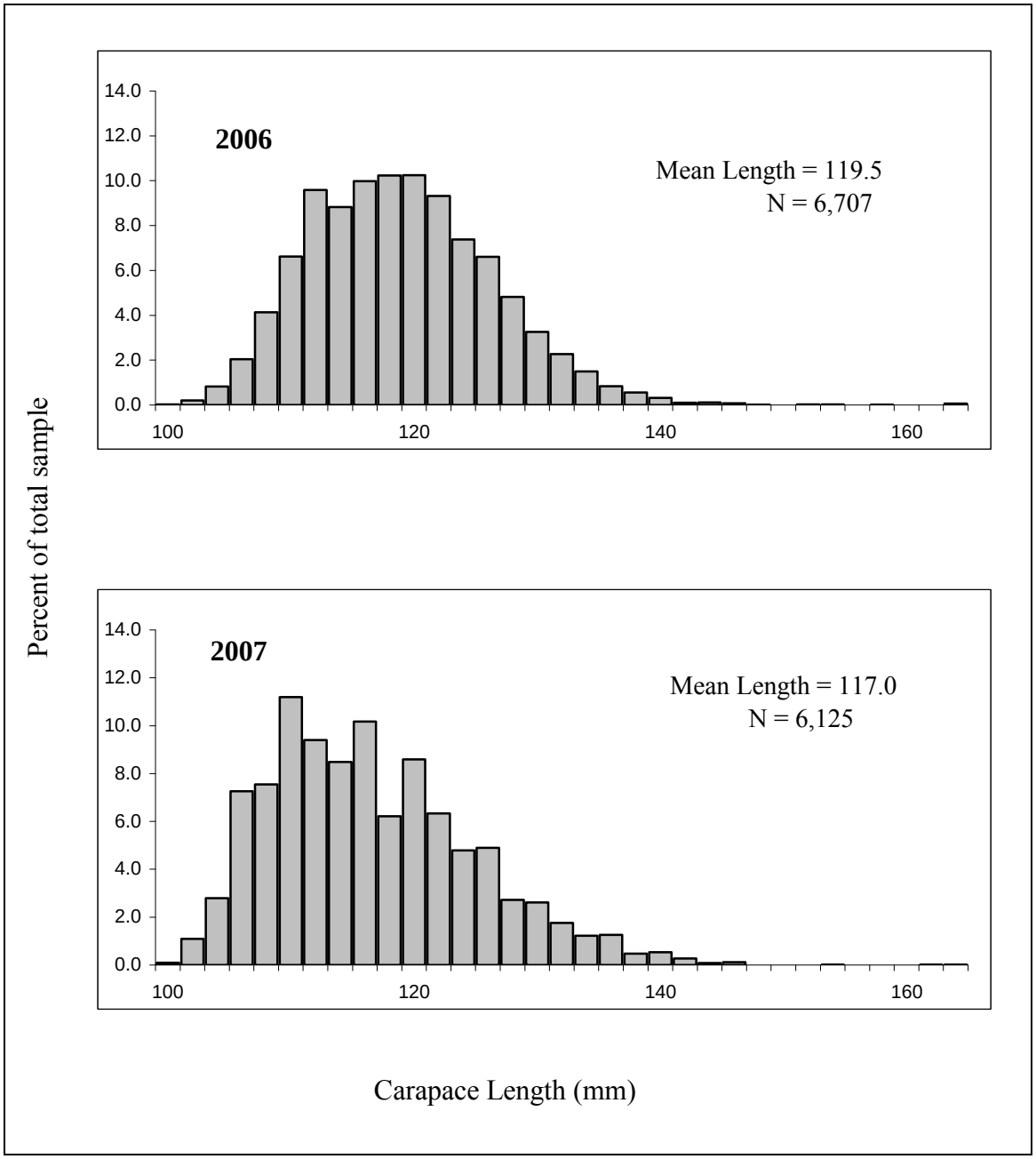


Figure 33.–Length composition of Norton Sound red king crab summer commercial harvest, 2006-2007.

APPENDIX A.

Appendix A1.–Commercial salmon catch by species, Norton Sound District, 1961–2007.

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 2002–2006	36	68	55,379	0	4,896	60,379
Average 1997–2006	2,963	71	40,458	106,222	13,834	163,547

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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	16	17,058	0	3,560	20,646
2004	0	40	42,016	0	6,296	48,352
2005	151	280	85,255	0	3,983	89,669
2006	12	3	130,808	0	10,042	140,865
2007	19	2	126,115	3,769	22,431	152,336
Average 2002–2006	36	68	55,379	0	4,896	60,379
Average 1997–2006	2,963	71	40,458	106,222	13,834	163,547

Appendix A2.–Number of commercial salmon permits fished, Norton Sound, 1970–2007.

	Subdistrict						District
Year	1	2	3	4	5	6	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
Average 2002–2006	0	0	0	0	12	24	36
Average 1997–2006	0	4	6	1	16	35	55

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

[b] Data not available.

Appendix A3.–Round weight and value of commercially caught salmon by species, Norton Sound District, 1961–2007.

Year	Pounds Caught (Round Wt. in lbs)				Salmon Roe (lbs)	Value of Catch($)
	Chinook	Coho	Pink	Chum		
1961	120,405	96,649	102,711	347,990		[b]
1962[a]	157,000	[b]	10,569	221,645		105,800
1963[a]	89,700	51,750	[b]	[b]		104,000
1964[a]	39,169	686	[b]	249,890		51,000
1965	33,327	14,210	660	264,924	[b]	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	[b]	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	[b]	285,283
1977	102,341	28,044	162,457	1,415,981	[b]	546,010
1978	222,974	50,872	1,164,174	1,389,806	[b]	907,330
1979	231,988	251,129	598,785	1,001,548	[b]	878,792
1980	135,646	204,498	719,368	1,301,693	[b]	572,125
1981	164,182	212,065	719,102	1,284,193	[b]	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
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

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

[b] Information not available.

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

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

Appendix A4.–Estimated mean prices paid to commercial salmon fishers in dollars, Norton Sound District, 1962–2007.

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	
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
Avg 2002-06	0.94	0.38	-	0.13	0.45

Note: Sockeye salmon was only purchased in 1993, 2001, 2003, 2005, and 2007.

Appendix A5.–Mean commercial salmon harvest weights, Norton Sound District, 1964–2007.

Year	Mean Round Weight in Pounds [a]			
	Chinook	Coho	Pink	Chum
1964	-	-	-	7.0
1965	-	-	2.3	7.1
1966	-	-	3.5	7.8
1967	23.7	7.0	3.6	7.2
1968	20.0	7.0	4.0	7.5
1969	19.3	7.5	3.6	6.4
1970	20.0	7.0	3.5	7.8
1971	23.7	7.0	3.6	7.2
1972	20.0	7.3	2.8	6.9
1973	20.3	6.8	3.9	7.1
1974	18.2	6.7	3.4	6.6
1975	10.8	7.4	2.9	6.5
1976	15.2	7.2	3.1	7.0
1977	22.7	7.6	3.3	7.0
1978	22.8	6.9	3.6	7.4
1979	22.9	7.1	3.6	7.2
1980	21.5	6.8	3.2	7.2
1981	20.7	6.7	3.5	7.6
1982	16.5	7.1	2.9	7.3
1983	17.4	7.2	3.6	7.4
1984	20.0	7.7	2.9	7.0
1985	21.5	7.7	3.1	7.0
1986	20.8	6.9	3.2	6.9
1987	20.0	7.3	3.0	7.1
1988	16.4	7.5	3.0	7.1
1989	18.4	7.6	3.6	7.0
1990	19.0	7.5	-	7.4
1991	17.7	7.4	-	6.9
1992[b]	12.7	7.8	2.9	7.1
1993	16.9	6.6	2.6	6.5
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	14.4	6.6	[c]	6.8
2007	10.8	7.9	2.8	6.7

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

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

[c] None caught commercially.

Appendix A6.–Commercial and subsistence salmon catch by species, by year in Nome Subdistrict, Norton Sound District, 1964–2007.

	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	-	-	1	1,194	1,200	-	-	-	-	-	-	5	-	-	1	1,194	1,200
1965	1	-	-	193	1,941	2,135	-	-	-	780	1,825	2,605	1	-	-	973	3,766	4,740
1966	1	-	32	1	581	615	12	-	-	1,794	1,762	3,568	13	-	32	1,795	2,343	4,183
1967	-	-	-	72	406	478	11	-	-	349	627	987	11	-	-	421	1,033	1,465
1968	-	-	-	50	102	152	7	-	-	6,507	621	7,135	7	-	-	6,557	723	7,287
1969	-	-	63	330	601	994	2	-	-	3,649	508	4,159	2	-	63	3,979	1,109	5,153
1970	-	-	6	55	960	1,021	-	-	35	5,001	458	5,494	0	-	41	5,056	1,418	6,515
1971	11	-	-	14	2,315	2,340	-	-	122	5,457	2,900	8,479	11	-	122	5,471	5,215	10,819
1972	15	-	-	12	2,643	2,670	19	-	52	4,684	315	5,070	34	-	52	4,696	2,958	7,740
1973	-	-	-	321	1,132	1,453	14	-	120	5,108	1,863	7,105	14	-	120	5,429	2,995	8,558
1974	19	-	123	7,722	10,431	18,295	8	-	5	3,818	183	4,014	27	-	128	11,540	10,614	22,309
1975	2	-	319	2,163	8,364	10,848	2	-	97	6,267	2,858	9,224	4	-	416	8,430	11,222	20,072
1976	2	10	26	1,331	7,620	8,989	13	-	189	5,492	1,705	7,399	15	10	215	6,823	9,325	16,388
1977	8	-	58	65	15,998	16,129	35	-	498	2,773	12,192	15,498	43	-	556	2,838	28,190	31,627
1978	19	-	-	22,869	8,782	31,670	35	-	225	13,063	4,295	17,618	54	-	225	35,932	13,077	49,288
1979	9	-	29	5,860	5,391	11,289	11	-	1,120	6,353	3,273	10,757	20	-	1,149	12,213	8,664	22,046
1980	8	-	-	10,007	13,922	23,937	129	-	2,157	22,246	5,983	30,515	137	-	2,157	32,253	19,905	54,452
1981	4	-	508	3,202	18,666	22,380	35	14	1,726	5,584	8,579	15,938	39	14	2,234	8,786	27,245	38,318
1982	20	-	1,183	18,512	13,447	33,162	21	6	1,829	19,202	4,831	25,889	41	6	3,012	37,714	18,278	59,051
1983	23	-	261	308	11,691	12,283	74	53	1,911	8,086	7,091	17,215	97	53	2,172	8,394	18,782	29,498
1984	7	-	820	-	3,744	4,571	83	16	1,795	17,182	4,883	23,959	90	16	2,615	17,182	8,627	28,530
1985	21	-	356	-	6,219	6,596	56	114	1,054	2,117	5,667	9,008	77	114	1,410	2,117	11,886	15,604
1986	6	-	50	-	8,160	8,216	150	107	688	8,720	8,085	17,750	156	107	738	8,720	16,245	25,966
1987	3	-	577	-	5,646	6,226	200	107	1,100	1,251	8,394	11,052	203	107	1,677	1,251	14,040	17,278
1988	2	-	54	182	1,628	1,866	63	133	1,076	2,159	5,952	9,383	65	133	1,130	2,341	7,580	11,249
1989	2	0	0	123	492	617	24	131	469	924	3,399	4,947	26	131	469	1,047	3,891	5,564
1990	0	0	0	0	0	0	58	234	510	2,233	4,246	7,281	58	234	510	2,233	4,246	7,281
1991	0	0	0	0	0	0	83	166	1,279	194	3,715	5,437	83	166	1,279	194	3,715	5,437
1992	1	2	693	185	881	1,762	152	163	1,481	7,351	1,684	10,831	153	165	2,174	7,536	2,565	12,593
1993	0	2	611	0	132	745	52	80	2,070	873	1,766	4,841	52	82	2,681	873	1,898	5,586
1994	0	1	287	0	66	354	23	69	983	6,556	1,673	9,304	23	70	1,270	6,556	1,739	9,658
1995	0	1	369	0	122	492	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	0	0	0	0	0	0	11	85	161	58	337	652	11	85	161	58	337	652

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	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
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	0	0	0	0	0	0	24	159	3,808	9,329	940	14,260	24	159	3,808	9,329	940	14,260
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
5-year avg.[a]	0	0	0	0	0	0	51	119	1,537	6,624	821	9,152	51	119	1,537	6,624	821	9,152
10-year avg.[b]	0	0	0	0	0	0	25	79	867	3,720	863	5,634	25	79	867	3,720	863	5,634

[a] 2002–2006.

[b] 1997–2006.

Appendix A7.–Commercial and subsistence salmon catch by species, by year in Golovin Subdistrict, Norton Sound District, 1962–2007.

	GOLOVIN (SUBDISTRICT 2)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	45	11	264	10,276	68,720	79,316	-	-	-	-	-	-	45	11	264	10,276	68,720	79,316
1963	40	40	-	19,677	49,850	69,607	-	-	118	5,702	9,319	15,139	40	40	118	25,379	59,169	84,746
1964	27	40	3	7,236	58,301	65,607	-	-	-	-	-	-	27	40	3	7,236	58,301	65,607
1965	-	-	-	-	-	-	2	-	49	1,523	3,847	5,421	2	-	49	1,523	3,847	5,421
1966	17	14	584	4,665	29,791	35,071	4	-	176	1,573	3,520	5,273	21	14	760	6,238	33,311	40,344
1967	10	-	747	5,790	31,193	37,740	3	-	185	2,774	4,803	7,765	13	-	932	8,564	35,996	45,505
1968	12	-	205	18,428	10,011	28,656	4	-	181	4,955	1,744	6,884	16	-	386	23,383	11,755	35,540
1969	28	-	1,224	23,208	20,949	45,409	2	-	190	2,760	2,514	5,466	30	-	1,414	25,968	23,463	50,875
1970	13	-	3	18,721	20,566	39,303	4	-	353	2,046	2,614	5,017	17	-	356	20,767	23,180	44,320
1971	37	-	197	2,735	33,824	36,793	7	-	191	1,544	1,936	3,678	44	-	388	4,279	35,760	40,471
1972	36	-	20	6,562	27,097	33,715	4	-	62	1,735	2,028	3,829	40	-	82	8,297	29,125	37,544
1973	70	-	183	14,145	41,689	56,087	1	-	48	9	74	132	71	-	231	14,154	41,763	56,219
1974	30	-	3	28,340	30,173	58,546	3	-	-	967	205	1,175	33	-	3	29,307	30,378	59,721
1975	17	-	206	10,770	41,761	52,754	-	-	1	2,011	2,025	4,037	17	-	207	12,781	43,786	56,791
1976	12	-	1,311	24,051	30,219	55,593	-	-	-	1,995	1,128	3,123	12	-	1,311	26,046	31,347	58,716
1977	26	-	426	7,928	53,912	62,292	3	-	80	703	2,915	3,701	29	-	506	8,631	56,827	65,993
1978	22	-	94	72,033	41,462	113,611	1	-	-	2,470	1,061	3,532	23	-	94	74,503	42,523	117,143
1979	75	49	1,606	45,948	30,201	77,879	-	-	845	2,546	2,840	6,231	75	49	2,451	48,494	33,041	84,110
1980	36	36	328	10,774	52,609	63,783	12	-	692	10,727	4,057	15,488	48	36	1,020	21,501	56,666	79,271
1981	23	5	13	49,755	58,323	108,119	8	-	1,520	5,158	5,543	12,229	31	5	1,533	54,913	63,866	120,348
1982	78	5	4,281	39,510	51,970	95,844	7	-	1,289	4,752	1,868	7,916	85	5	5,570	44,262	53,838	103,760
1983	52	10	295	17,414	48,283	66,054	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1984	31	-	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]
1991	49	1	0	0	14,839	14,889	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1992	6	9	2,085	0	1,002	3,102	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1993	1	4	2	8,480	2,803	11,290	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1994 [b]	0	0	3,424	0	111	3,535	253	168	733	8,410	1,337	10,901	253	168	4,157	8,410	1,448	14,436
1995 [b]	0	0	1,616	4,296	1,987	7,899	165	34	1,649	7,818	10,373	20,039	165	34	3,265	12,114	12,360	27,938
1996 [b]	0	0	638	0	0	638	86	134	3,014	17,399	2,867	23,500	86	134	3,652	17,399	2,867	24,138
1997 [b]	19	2	102	20	8,003	8,146	138	427	555	4,570	4,891	10,581	157	429	657	4,590	12,894	18,727

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	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
1998 [b]	1	0	3	106,761	723	107,488	184	37	1,292	13,340	1,893	16,746	185	37	1,295	120,101	2,616	124,234
1999 [b]	0	0	0	0	0	0	60	48	1,234	469	3,656	5,467	60	48	1,234	469	3,656	5,467
2000 [b]	0	0	1,645	17,408	164	19,217	169	18	2,335	10,906	1,155	14,583	169	18	3,980	28,314	1,319	33,800
2001 [b]	0	43	30	0	7,094	7,167	89	72	880	1,665	3,291	5,997	89	115	910	1,665	10,385	13,164
2002 [b]	0	0	0	0	0	0	69	66	1,640	14,430	1,882	18,087	69	66	1,640	14,430	1,882	18,087
2003 [b]	0	0	0	0	0	0	166	28	309	5,012	1,477	6,992	166	28	309	5,012	1,477	6,992
2004 [c]	0	0	0	0	0	0	164	6	654	19,936	880	21,640	164	6	654	19,936	880	21,640
2005 [c]	0	0	0	0	0	0	96	15	686	11,467	1,852	14,116	96	15	686	11,467	1,852	14,116
2006 [c]	0	0	0	0	0	0	136	38	1,760	14,670	722	17,326	136	38	1,760	14,670	722	17,326
2007	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
5-year avg. [d]	0	0	0	0	0	0	126	31	1,010	13,103	1,363	15,632	126	31	1,010	13,103	1,363	15,632
10-year avg. [e]	2	4	162	11,290	1,453	12,911	106	38	1,031	8,770	1,973	11,958	106	38	1,031	8,770	1,973	11,958

[a] Subsistence surveys were not conducted.

[b] Subsistence harvests were estimated from Division of Subsistence surveys.

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

[d] 2002–2006.

[e] 1997–2006.

Appendix A8.–Commercial and subsistence salmon catch by species, by year in Moses Point Subdistrict, Norton Sound District, 1962–2007.

	MOSES POINT (SUBDISTRICT 3)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	27	-	-	11,100	50,683	61,810	-	-	-	-	-	-	-	-	-	-	-	-
1963	15	-	-	2,549	46,274	48,838	5	-	-	5,808	8,316	14,129	20	-	-	8,357	54,590	62,967
1964	32	3	-	3,372	28,568	31,975	-	-	-	63	348	411	-	-	-	3,435	28,916	32,386
1965	-	-	-	-	-	-	16	-	72	1,325	9,857	11,270	-	-	-	-	-	-
1966	17	-	-	2,745	24,741	27,503	14	-	250	2,511	5,409	8,184	31	-	-	5,256	30,150	35,687
1967	-	-	-	-	-	-	39	-	116	1,322	9,913	11,390	-	-	-	-	-	-
1968	12	-	1	9,012	17,908	26,933	2	-	80	6,135	2,527	8,744	14	-	81	15,147	20,435	35,677
1969	29	-	-	11,807	26,594	38,430	9	-	109	1,790	1,303	3,211	38	-	-	13,597	27,897	41,641
1970	39	-	-	13,052	29,726	42,817	16	-	160	4,661	6,960	11,797	55	-	-	17,713	36,686	54,614
1971	95	-	4	922	43,831	44,852	16	-	271	1,046	2,227	3,560	111	-	275	1,968	46,058	48,412
1972	190	-	11	5,866	30,919	36,986	44	-	108	1,579	2,070	3,801	234	-	119	7,445	32,989	40,787
1973	134	-	-	10,603	31,389	42,126	2	-	-		298	300	136	-	-	10,603	31,687	42,426
1974	198	-	9	12,821	55,276	68,304	3	-	-	2,382	1,723	4,108	201	-	-	15,203	56,999	72,412
1975	16	-	-	4,407	46,699	51,122	2	-	6	1,280	508	1,796	18	-	-	5,687	47,207	52,918
1976	24	-	232	5,072	10,890	16,218	22	-	-	5,016	1,548	6,586	46	-	-	10,088	12,438	22,804
1977	96	-	6	9,443	47,455	57,000	22	-	225	1,145	1,170	2,562	118	-	231	10,588	48,625	59,562
1978	444	-	244	39,694	44,595	84,977	38	-	407	1,995	1,229	3,669	482	-	651	41,689	45,824	88,646
1979	1,035	-	177	40,811	37,123	79,146	16	-	890	6,078	1,195	8,179	1,051	-	1,067	46,889	38,318	87,325
1980	502	-	-	1,435	14,755	16,692	131	-	229	4,232	1,393	5,985	633	-	-	5,667	16,148	22,677
1981	198	-	5	26,417	29,325	55,945	32	-	2,345	6,530	2,819	11,726	230	-	2,350	32,947	32,144	67,671
1982	253	-	318	9,849	40,030	50,450	1	-	1,835	3,785	3,537	9,158	254	-	2,153	13,634	43,567	59,608
1983	254	-	-	17,027	65,776	83,057	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1984	-	-	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]
1991 [b]	161	0	0	0	804	965	312	-	2,153	3,555	2,660	8,680	473	-	2,153	3,555	3,464	9,645
1992 [b]	0	0	3,531	0	6	3,537	100	-	1,281	6,152	1,260	8,793	100	-	4,812	6,152	1,266	12,330
1993 [b]	3	0	4,065	0	167	4,235	368	-	1,217	1,726	1,635	4,946	371	-	5,282	1,726	1,802	9,181
1994 [b]	0	0	5,345	0	414	5,759	322	104	1,180	9,345	3,476	14,427	322	104	6,525	9,345	3,890	20,186
1995 [b]	4	44	3,742	2,962	1,171	7,923	284	17	1,353	2,046	3,774	7,474	288	61	5,095	5,008	4,945	15,397
1996 [b]	0	0	1,915	68,609	0	70,524	417	52	1,720	9,442	2,319	13,950	417	52	3,635	78,051	2,319	84,474
1997 [b]	844	0	1,409	0	2,683	4,936	619	50	1,213	1,314	2,064	5,260	1,463	50	2,622	1,314	4,747	10,196

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	MOSES POINT (SUBDISTRICT 3)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1998 [b]	105	0	1,462	145,669	2,311	149,547	414	49	1,831	6,891	1,376	10,561	519	49	3,293	152,560	3,687	160,108
1999 [b]	0	0	0	0	0	0	424	13	975	1,564	744	3,720	424	13	975	1,564	744	3,720
2000 [b]	10	0	5,182	46,369	535	52,096	248	46	1,429	5,983	1,173	8,879	258	46	6,611	52,352	1,708	60,975
2001 [b]	7	0	1,696	0	681	2,384	427	70	1,352	1,390	898	4,137	434	70	3,048	1,390	1,579	6,521
2002 [b]	0	0	0	0	0	0	565	14	1,801	8,345	1,451	12,176	565	14	1,801	8,345	1,451	12,176
2003 [b]	0	0	0	0	0	0	660	39	1,143	2,524	1,687	6,053	660	39	1,143	2,524	1,687	6,053
2004 [c]	0	0	0	0	0	0	412	0	704	7,858	683	9,657	412	0	704	7,858	683	9,657
2005 [c]	0	0	0	0	0	0	225	9	1,011	3,721	598	5,564	225	9	1,011	3,721	598	5,564
2006 [c]	0	0	0	0	0	0	179	13	1,769	5,216	1,267	8,444	179	13	1,769	5,216	1,267	8,444
2007	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
5-year avg.[d]	0	0	0	0	0	0	408	15	1,286	5,533	1,137	8,379	408	15	1,286	5,533	1,137	8,379
10-year avg.[e]	97	0	975	19,204	621	20,896	417	30	1,323	4,481	1,194	7,445	514	30	2,298	23,684	1,815	28,341

[a] Subsistence surveys were not conducted.

[b] Subsistence harvests were estimated from Division of Subsistence surveys.

[c] 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.

[d] 2002–2006.

[e] 1997–2006.

Appendix A9.–Commercial and subsistence salmon catch by species, by year in Norton Bay Subdistrict, Norton Sound District, 1962–2007.

NORTON BAY (SUBDISTRICT 4)																		
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	387	7	40	4,402	24,380	29,216	-	-	-	-	-	-	387	7	40	4,402	24,380	29,216
1963	137	2	-	17,676	12,469	30,284	-	-	-	5,097	-	5,097	137	2	-	22,773	12,469	35,381
1964	50	3	-	988	5,916	6,957	-	-	-	-	-	-	50	3	-	988	5,916	6,957
1965	-	-	-	-	-	-	4	-	22	252	3,032	3,310	4	-	22	252	3,032	3,310
1966	-	-	-	-	-	-	7	-	41	929	3,612	4,589	7	-	41	929	3,612	4,589
1967	-	-	-	-	-	-	12	-	14	1,097	2,945	4,068	12	-	14	1,097	2,945	4,068
1968	-	-	-	-	-	-	28	-	71	1,916	1,872	3,887	28	-	71	1,916	1,872	3,887
1969	26	-	-	4,849	3,974	8,849	59	-	189	2,115	3,855	6,218	85	-	189	6,964	7,829	15,067
1970	-	-	-	-		-	3	-	10	840	3,500	4,353	3	-	10	840	3,500	4,353
1971	-	-	-	-	-	-	5	-	47	92	2,619	2,763	5	-	47	92	2,619	2,763
1972	43	-	-	1,713	7,799	9,555	30	-	44	2,089	2,022	4,185	73	-	44	3,802	9,821	13,740
1973	28	-	-	1,645	4,672	6,345	1	-	-	10	130	141	29	-	-	1,655	4,802	6,486
1974	21	-	-	654	3,826	4,501	-	-	-	17	900	917	21	-	-	671	4,726	5,418
1975	68	-	89	1,137	17,385	18,679	1	-	-	93	361	455	69	-	89	1,230	17,746	19,134
1976	102	-	95	4,456	7,161	11,814	2	-	-	41	236	279	104	-	95	4,497	7,397	12,093
1977	158	-	1	2,495	13,563	16,217	14	-	-	420	2,055	2,489	172	-	1	2,915	15,618	18,706
1978	470	-	144	8,471	21,973	31,058	12	-	21	1,210	1,060	2,303	482	-	165	9,681	23,033	33,361
1979	856	-	2,547	6,201	15,599	25,203	12	-	697	735	1,400	2,844	868	-	3,244	6,936	16,999	28,047
1980	340	-	-	47	7,855	8,242	22	-	33	4,275	1,132	5,462	362	-	33	4,322	8,987	13,704
1981	63	-	-	177	3,111	3,351	7	-	82	2,314	3,515	5,918	70	-	82	2,491	6,626	9,269
1982	96	-	2,332	2,535	7,128	12,091	1	-	484	2,600	2,485	5,570	97	-	2,816	5,135	9,613	17,661
1983	215	-	204	3,935	17,157	21,511	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1984	-	-	-	1,162	3,442	4,604	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1985	528	-	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	-	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	-	-	-	-	-	-	[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]
1991	0	0	0	0	0	0	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1992	27	0	0	0	1,787	1,814	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1993	267	0	0	290	1,378	1,935	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1994 [b]	0	0	0	0	0	0	308	1	370	6,049	4,581	11,309	308	1	370	6,049	4,581	11,309
1995 [b]	0	0	0	0	0	0	475	46	985	3,514	5,828	10,848	475	46	985	3,514	5,828	10,848
1996 [b]	0	0	0	0	0	0	295	3	676	3,929	4,161	9,064	295	3	676	3,929	4,161	9,064

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Appendix A9.–Page 2 of 2.

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
1997 [b]	194	0	0	0	531	725	656	54	322	1,795	4,040	6,867	850	54	322	1,795	4,571	7,592
1998 [b]	0	0	0	0	0	0	684	0	388	2,009	6,192	9,273	684	0	388	2,009	6,192	9,273
1999 [b]	0	0	0	0	0	0	327	0	167	1,943	4,153	6,590	327	0	167	1,943	4,153	6,590
2000 [b]	0	0	0	0	0	0	397	2	267	2,255	4,714	7,635	397	2	267	2,255	4,714	7,635
2001 [b]	0	0	0	0	0	0	460	14	276	5,203	4,445	10,398	460	14	276	5,203	4,445	10,398
2002 [b]	0	0	0	0	0	0	557	0	509	6,049	3,971	11,086	557	0	509	6,049	3,971	11,086
2003 [b]	0	0	0	0	0	0	373	46	510	4,184	3,397	8,510	373	46	510	4,184	3,397	8,510
2004	0	0	0	0	0	0	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
2005	0	0	0	0	0	0	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
2006	0	0	0	0	0	0	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
2007	0	0	0	0	0	0	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
5-year avg. [c]	0	0	0	0	0	0	186	9	204	2,047	1,474	3,919	186	9	204	2,047	1,474	3,919
10-year avg. [d]	19	0	0	0	53	73	345	12	244	2,344	3,091	6,036	365	12	244	2,344	3,144	6,108

[a] Subsistence surveys were not conducted.

[b] Subsistence harvests were estimated from Division of Subsistence surveys.

[c] 2002–2006.

[d] 1997–2006.

Appendix A10.–Commercial and subsistence salmon catch by species, by year in Shaktoolik Subdistrict, Norton Sound District, 1961–2007.

	SHAKTOOLIK (SUBDISTRICT 5)																	
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	140	-	-	29,075	24,746	53,961	-	-	-	-	-	-	140	-	-	29,075	24,746	53,961
1962	1,738	-	2,113	640	8,718	13,209	-	-	-	-	-	-	1,738	-	2,113	640	8,718	13,209
1963	480	11	563	5,138	19,153	25,345	-	-	-	-	-	-	480	11	563	5,138	19,153	25,345
1964	631	79	16	1,969	35,272	37,967	77	-	340	2,132	5,412	7,961	708	79	356	4,101	40,684	45,928
1965	127	30	-	3	8,356	8,516	31	-	107	3,763	3,420	7,321	158	30	107	3,766	11,776	15,837
1966	310	-	956	344	8,292	9,902	142	-	762	1,445	4,183	6,532	452	-	1,718	1,789	12,475	16,434
1967	43	-	88	1,050	1,655	2,836	262	-	387	2,010	4,436	7,095	305	-	475	3,060	6,091	9,931
1968	61	-	130	2,205	2,504	4,900	10	-	458	6,355	1,915	8,738	71	-	588	8,560	4,419	13,638
1969	33	-	276	6,197	8,645	15,151	40	-	193	4,018	3,439	7,690	73	-	469	10,215	12,084	22,841
1970	197	-	155	2,301	15,753	18,406	43	-	210	2,474	2,016	4,743	240	-	365	4,775	17,769	23,149
1971	284	-	238	28	13,399	13,949	87	-	329	494	5,060	5,970	371	-	567	522	18,459	19,919
1972	419	-	11	2,798	12,022	15,250	64	-	235	939	3,399	4,637	483	-	246	3,737	15,421	19,887
1973	289	-	177	6,450	14,500	21,416	51	-	130	3,410	1,397	4,988	340	-	307	9,860	15,897	26,404
1974	583	-	179	5,650	26,391	32,803	93	-	353	1,901	358	2,705	676	-	532	7,551	26,749	35,508
1975	651	2	812	1,774	49,536	52,775	18	-	14	1,394	334	1,760	669	2	826	3,168	49,870	54,535
1976	892	-	129	15,803	15,798	32,622	24	-	121	1,188	269	1,602	916	-	250	16,991	16,067	34,224
1977	1,521	4	418	7,743	36,591	46,277	49	-	170	585	2,190	2,994	1,570	4	588	8,328	38,781	49,271
1978	1,339	7	1,116	46,236	35,388	84,086	81	-	15	3,275	1,170	4,541	1,420	7	1,131	49,511	36,558	88,627
1979	2,377	-	3,383	18,944	22,030	46,734	62	-	1,605	2,575	1,670	5,912	2,439	-	4,988	21,519	23,700	52,646
1980	1,086	-	8,001	1,947	27,453	38,487	57	-	756	3,227	1,827	5,867	1,143	-	8,757	5,174	29,280	44,354
1981	1,484	4	1,191	29,695	21,097	53,471	8	-	525	2,225	3,490	6,248	1,492	4	1,716	31,920	24,587	59,719
1982	1,677	3	22,233	17,019	26,240	67,172	68	-	2,138	3,865	1,165	7,236	1,745	3	24,371	20,884	27,405	74,408
1983	2,742	4	12,877	12,031	67,310	94,964	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1984	1,613	-	10,730	1,596	32,309	46,248	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1985	5,312	-	2,808	-	13,403	21,523	298	-	1,379	24	298	1,999	5,610	-	4,187	24	13,701	3,522
1986	1,075	29	6,626	-	16,126	23,856	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1987	2,214	-	6,193	-	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]
1991	1,324	55	11,614	0	31,619	44,612	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1992	1,098	56	14,660	0	27,867	43,681	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1993	2,756	20	11,130	106,743	20,864	141,513	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1994 [b]	885	8	22,065	502,231	5,411	530,600	1,175	1	2,777	9,133	1,221	14,307	2,060	9	24,842	511,364	6,632	544,907
1995 [b]	1,239	5	10,856	37,377	14,775	64,252	1,275	2,480	2,626	7,024	2,480	15,885	2,514	2,485	13,482	44,401	17,255	80,137

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	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
1996 [b]	1,340	1	13,444	304,982	3,237	323,004	1,114	31	3,615	8,370	4,425	17,555	2,454	32	17,059	313,352	7,662	340,559
1997 [b]	2,449	0	4,694	-	5,747	12,890	1,146	62	2,761	5,779	1,612	11,360	3,595	62	7,455	5,779	7,359	24,250
1998 [b]	910	0	3,624	236,171	7,080	247,785	982	92	1,872	6,270	1,034	10,250	1,892	92	5,496	242,441	8,114	258,035
1999 [b]	581	0	2,398	0	2,181	5,160	818	183	1,556	5,092	467	8,116	1,399	183	3,954	5,092	2,648	13,276
2000 [b]	160	3	7,779	85,493	2,751	96,186	440	20	2,799	5,432	2,412	11,103	600	23	10,578	90,925	5,163	107,289
2001 [b]	90	0	2,664	0	1,819	4,573	936	143	2,090	10,172	1,553	14,894	1,026	143	4,754	10,172	3,372	19,467
2002 [b]	1	0	680	0	261	942	1,230	4	2,169	8,769	800	12,972	1,231	4	2,849	8,769	1,061	13,914
2003 [b]	2	0	4,031	0	485	4,518	881	50	2,941	12,332	587	16,791	883	50	6,972	12,332	1,072	21,309
2004	0	0	12,734	0	1,372	14,106	943	12	1,994	7,291	139	10,379	943	12	14,728	7,291	1,511	24,485
2005	50	0	21,818	0	791	22,659	807	0	1,913	12,075	202	14,997	857	0	23,731	12,075	993	37,656
2006	0	0	32,472	0	3,321	35,793	382	36	1,968	4,817	351	7,554	382	36	34,440	4,817	3,672	43,347
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
5-year avg. [c]	11	0	14,347	0	1,246	15,604	849	20	2,197	9,057	416	12,539	859	20	16,544	9,057	1,662	28,142
10-year avg. [d]	424	0	9,289	32,166	2,581	44,461	857	60	2,206	7,803	916	11,842	1,281	61	11,496	39,969	3,497	56,303

[a] Subsistence surveys were not conducted.

[b] Subsistence harvests were estimated from Division of Subsistence surveys.

[c] 2002–2006.

[d] 1997–2006.

Appendix A11.–Commercial and subsistence salmon catch by species, by year in Unalakleet Subdistrict, Norton Sound District, 1961–2007.

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	-	-	-	-	-	-	-	-	-	-	-	-
1962	5,089	-	6,739	6,769	30,283	48,880	-	-	-	-	-	-	-	-	-	-	-	-
1963	5,941	18	16,202	1,140	27,003	50,304	-	-	-	-	-	-	-	-	-	-	-	-
1964	1,273	1	79	1	19,611	20,965	488	-	2,227	7,030	6,726	16,471	1,761	-	2,306	7,031	26,337	37,436
1965	1,321	-	2,030	24	26,498	29,873	521	-	4,562	11,488	8,791	25,362	1,842	-	6,592	11,512	35,289	55,235
1966 [a]	1,208	-	4,183	5,023	16,840	27,254	90	-	789	6,083	3,387	10,349	1,298	-	4,972	11,106	20,227	37,603
1967 [a]	1,751	-	1,544	21,961	8,502	33,758	490	-	484	9,964	-	10,938	2,241	-	2,028	31,925	-	44,696
1968 [a]	960	-	6,549	41,474	14,865	63,848	186	-	1,493	11,044	2,982	15,705	1,146	-	8,042	52,518	17,847	79,553
1969 [a]	2,276	-	5,273	40,558	22,032	70,139	324	-	1,483	4,230	4,196	10,233	2,600	-	6,756	44,788	26,228	80,372
1970 [a]	1,604	-	4,261	30,779	40,029	76,673	495	-	3,907	10,104	7,214	21,720	2,099	-	8,168	40,883	47,243	98,393
1971 [a]	2,166	-	2,688	1,196	37,543	43,593	911	-	3,137	2,230	7,073	13,351	3,077	-	5,825	3,426	44,616	56,944
1972 [a]	2,235	-	412	28,231	20,440	51,318	643	-	1,818	3,132	4,132	9,725	2,878	-	2,230	31,363	24,572	61,043
1973	1,397	-	8,922	13,335	25,716	49,370	323	-	213	6,233	3,426	10,195	1,720	-	9,135	19,568	29,142	59,565
1974	2,100	-	1,778	93,332	36,170	133,380	313	-	706	7,341	588	8,948	2,413	-	2,484	100,673	36,758	142,328
1975	1,638	-	3,167	12,137	48,740	65,682	163	-	74	4,758	2,038	7,033	1,801	-	3,241	16,895	50,778	72,715
1976	1,211	1	5,141	37,203	24,268	67,824	142	-	694	4,316	2,832	7,984	1,353	-	5,835	41,519	27,100	75,808
1977	2,691	1	2,781	21,001	32,936	59,410	723	-	1,557	8,870	6,085	17,235	3,414	-	4,338	29,871	39,021	76,645
1978	7,525	5	5,737	136,200	37,079	186,546	1,044	-	2,538	13,268	3,442	20,292	8,569	-	8,275	149,468	40,521	206,838
1979	6,354	8	23,696	49,647	30,445	110,150	640	-	3,330	6,960	1,597	12,527	6,994	-	27,026	56,607	32,042	122,677
1980	4,339	3	21,512	203,142	64,198	293,194	1,046	-	4,758	19,071	5,230	30,105	5,385	-	26,270	222,213	69,428	323,299
1981	6,157	47	29,845	123,233	39,186	198,468	869	24	5,808	5,750	4,235	16,686	7,026	71	35,653	128,983	43,421	215,154
1982	3,768	2	61,343	142,856	44,520	252,489	913	2	7,037	20,045	4,694	32,691	4,681	4	68,380	162,901	49,214	285,180
1983	7,022	13	36,098	26,198	109,220	178,551	1,868	33	6,888	13,808	4,401	26,998	8,890	46	42,986	40,006	113,621	205,549
1984	6,804	6	47,904	-	43,317	98,031	1,650	1	6,675	17,418	3,348	29,092	8,454	7	54,579	-	46,665	127,123
1985	12,621	21	15,421	1	25,111	53,175	1,397	3	2,244	55	1,968	5,667	14,018	24	17,665	56	27,079	58,842
1986	4,494	153	20,580	-	30,239	55,466	[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 [c]	4,402	222	36,025	-	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	-	23,659	82,030	2,476 [d]	[b]	[b]	[b]	[b]	[b]	8,474	[b]	[b]	[b]	[b]	[b]
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 [d]	4,400	71	71,019	480,158	12,288	567,936	5,294	819	16,081	31,572	12,732	66,498	9,694	890	87,100	511,730	25,020	634,434
1995 [d]	7,617	78	31,280	37,009	24,843	100,827	5,049	807	13,110	17,246	13,460	49,672	12,666	885	44,390	54,255	38,303	150,499

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Appendix A11.–Page 2 of 2.

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
1996 [d]	3,644	-	52,200	113,837	7,369	177,050	5,324	608	15,963	19,782	16,481	58,158	8,968	-	68,163	133,619	23,850	235,208
1997 [d]	9,067	159	26,079	-	17,139	52,444	6,325	353	9,120	10,804	7,649	34,251	15,392	512	35,199	-	24,788	86,695
1998 [d]	6,413	7	24,534	99,412	6,210	136,576	5,915	639	11,825	17,259	7,962	43,600	12,328	646	36,359	116,671	14,172	180,176
1999 [d]	1,927	0	10,264	0	5,700	17,891	4,504	848	10,250	10,791	10,040	36,433	6,431	848	20,514	10,791	15,740	54,324
2000 [d]	582	11	29,803	17,278	2,700	50,374	2,887	569	9,487	11,075	7,294	31,312	3,469	580	39,290	28,353	9,994	81,686
2001 [d]	116	1	15,102	0	1,512	16,731	3,662	376	9,520	11,710	9,163	34,431	3,778	377	24,622	11,710	10,675	51,162
2002 [d]	4	1	1,079	0	339	1,423	3,044	600	8,301	23,599	8,599	44,143	3,048	601	9,380	23,599	8,938	45,566
2003	10	0	13,027	0	3,075	16,112	2,585	283	6,192	21,777	1,785	32,622	2,595	283	19,219	21,777	4,860	48,734
2004	0	40	29,282	0	4,924	34,246	2,801	334	5,978	20,883	1,211	31,207	2,801	374	35,260	20,883	6,135	65,453
2005	101	280	63,437	0	3,192	67,010	2,115	593	6,949	21,836	1,506	32,999	2,216	873	70,386	21,836	4,698	100,009
2006	11	3	98,336	0	6,721	105,071	2,155	326	7,937	22,547	2,712	35,677	2,166	329	106,273	22,547	9,433	140,748
2007	13	2	88,397	2,121	11,788	102,321	1,665	292	6,003	11,759	2,094	21,813	1,678	294	94,400	13,880	13,882	124,134
5-year avg. [e]	25	65	41,032	0	3,650	44,772	2,540	427	7,071	22,128	3,163	35,330	2,565	492	48,104	22,128	6,813	80,102
10-year avg. [f]	1,823	50	31,094	11,669	5,151	49,788	3,599	492	8,556	17,228	5,792	35,668	5,422	542	39,650	27,817	10,943	85,455

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

[b] Subsistence surveys were not conducted.

[c] In-depth survey by the Division of Subsistence.

[d] Subsistence harvests were estimated from Division of Subsistence surveys and included harvests in Stebbins and St. Michael.

[e] 2002–2006.

[f] 1997–2006.

Appendix A12.–Subsistence salmon catch by species and year for St. Michael and Stebbins in Norton Sound District, 1993–2007.

Year[a]	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	491	3,265
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
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	4236	4321	140	4856	13,908
2007	763	4,980	1,881	0	2,006	9,630

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, 1961–2007.

	SUBDISTRICTS 1-6																	
	Commercial						Subsistence						Sport					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,300	35	13,807	34,237	48,332	101,711	-	-	-	-	-	-	-	-	-	-	-	-
1962	7,286	18	9,156	33,187	182,784	232,431	-	-	-	-	-	-	-	-	-	-	-	-
1963	6,613	71	16,765	46,180	154,749	224,378	5	-	118	16,607	17,635	34,365	-	-	-	-	-	-
1964	2,018	126	98	13,567	148,862	164,671	565	-	2,567	9,225	12,486	24,843	-	-	-	-	-	-
1965	128	30	2,030	220	36,795	39,203	574	-	4,812	19,131	30,772	55,289	-	-	-	-	-	-
1966	1,553	14	5,755	12,778	80,245	100,345	269	-	2,210	14,335	21,873	38,687	-	-	-	-	-	-
1967	1,804	-	2,379	28,879	41,756	74,818	817	-	1,222	17,516	22,724	42,279	-	-	-	-	-	-
1968	1,045	-	6,885	71,179	45,300	124,409	237	-	2,391	36,912	11,661	51,201	-	-	-	-	-	-
1969	2,392	-	6,836	86,949	82,795	178,972	436	-	2,191	18,562	15,615	36,804	-	-	-	-	-	-
1970	1,853	-	4,423	64,908	107,034	178,218	561	-	4,675	26,127	22,763	54,126	-	-	-	-	-	-
1971	2,593	-	3,127	4,895	131,362	141,977	1,026	197	4,097	10,863	21,618	37,801	-	-	-	-	-	-
1972	2,938	-	454	45,182	100,920	149,494	804	93	2,319	14,158	13,873	31,247	-	-	-	-	-	-
1973	1,918	-	9,282	46,499	119,098	176,797	392	-	520	14,770	7,185	22,867	-	-	-	-	-	-
1974	2,951	-	2,092	148,519	162,267	315,829	420	-	1,064	16,426	3,958	21,868	-	-	-	-	-	-
1975	2,393	2	4,593	32,388	212,485	251,861	186	11	192	15,803	8,113	24,305	-	-	-	-	-	-
1976	2,243	11	6,934	87,919	95,956	193,063	203	-	1,004	18,048	7,718	26,973	-	-	-	-	-	-
1977	4,500	5	3,690	48,675	200,455	257,325	846	-	2,530	14,296	26,607	44,279	197	0	449	2,402	670	3,718
1978	9,819	12	7,335	325,503	189,279	531,948	1,211	-	2,981	35,281	12,257	51,730	303	0	742	7,399	546	8,990
1979	10,706	57	31,438	167,411	140,789	350,401	747	-	8,487	25,247	11,975	46,456	-	-	-	-	-	-
1980	6,311	40	29,842	227,352	180,792	444,337	1,397	-	8,625	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	1,416	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	1,612	54,249	18,580	88,460	409	0	2,986	13,742	2,620	19,757
1983 [b]	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 [b]	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 [b]	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 [b]	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 [b]	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 [b]	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 [b]	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 [b]	8,895	434	56,712	501	65,123	131,665	58	234	510	2,233	4,246	7,281	364	198	3,305	7,647	925	12,439
1991 [b]	6,068	203	63,647	-	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 [b]	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 [b]	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	7,375	1,162	22,124	71,065	25,020	126,746	600	18	5,547	7,051	536	13,752

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	SUBDISTRICTS 1-6																	
	Commercial						Subsistence						Sport					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1995	8,860	128	47,863	81,644	42,898	181,393	7,274	3,532	21,088	37,984	39,709	109,587	438	104	3,705	928	394	5,569
1996	4,984	1	68,206	487,441	10,609	571,241	7,245	1,013	25,816	62,432	32,540	129,046	662	100	7,289	5,972	662	14,685
1997 [a]	12,573	161	32,284	20	34,103	79,141	8,989	1,843	16,267	27,088	24,503	78,690	1,106	30	4,393	1,458	278	7,265
1998 [a]	7,429	7	29,623	588,013	16,324	641,396	8,295	1,214	19,007	51,933	20,032	100,480	590	16	4,441	6,939	682	12,668
1999	2,508	0	12,662	0	7,881	23,051	6,144	1,177	14,343	19,917	19,397	60,978	630	0	5,582	3,039	211	9,462
2000	752	14	44,409	166,548	6,150	217,873	4,148	681	17,064	38,308	17,283	77,484	889	45	7,441	2,886	1,097	12,358
2001	213	44	19,492	0	11,106	30,855	5,576	767	14,543	30,253	20,208	71,347	271	39	4,802	360	1,709	7,181
2002	5	1	1,759	0	600	2,365	5,469	763	15,086	64,353	17,817	103,488	802	0	4,211	4,303	818	10,134
2003	12	0	17,058	0	3,560	20,630	4,728	522	11,446	46,336	9,498	72,530	239	572	3,039	2,222	292	6,364
2004 [b]	0	40	42,016	0	6,296	48,352	4,420	458	10,904	71,015	3,598	90,395	535	404	5,806	8,309	498	15,552
2005 [b]	151	280	85,255	0	3,983	89,669	3,305	794	11,846	54,174	4,961	75,080	216	0	3,959	473	36	4,684
2006 [b]	11	3	130,808	0	10,042	140,864	2,876	572	17,242	56,579	5,992	83,261	427	22	11,427	5,317	344	17,110
2007	19	2	126,115	3,769	22,431	152,336	2,646	938	12,023	12,039	12,048	48,694		Harvest	numbers	not yet	available	
5-year avg. [c]	36	65	55,379	0	4,896	60,376	4,160	622	13,305	58,491	8,373	84,951	444	200	5,688	4,125	398	10,769
10-year avg. [d]	2,365	55	41,537	75,458	10,005	129,420	5,395	879	14,775	45,996	14,329	81,373	571	113	5,510	3,531	597	10,278

[a] Subsistence totals include data from Savoonga and Gamble.

[b] Not all subdistricts were surveyed.

[c] 2002–2006.

[d] 1997–2006.

Appendix A14.–Sport salmon harvest by species, by year for the Unalakleet River, 1990–2007.

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	Harvest numbers not yet available				
2002–2006 avg.	321	3,402	221	955	4,899
1997–2006 avg.	397	3,214	311	1,036	4,958

Appendix A15.–Sport salmon harvest by species, by year for the Fish/Niukluk Rivers, 1990–2007.

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	Harvest numbers not yet available				
2002–2006 avg.	35	431	116	199	780
1997–2006 avg.	46	643	102	135	926

Appendix A16.–Comparative salmon aerial survey escapement indices of Norton Sound streams unless noted otherwise, 1961–2007.

	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	211,000	2,045	2	2,082	212,000	3,541
2006	0	1,115	515,000	2,147	0	394	1,121,000	3,650
2007	3	7,210	6,810	668	4	1,449	3,378	1,442

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	Flambeau River					Eldorado River			
Year[a]	Chinook	Chum	Pink	Pink & Chum[e]	Coho	Chinook	Chum	Pink	Coho
1961	-	400	80	-					
1962									
1963						-	400	2,000	-
1964									
1966									
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	-	2,250	200	-	751	-	109[d]	52,000[d]	755
2005	-	2,261	100	-	154	2	5,445	2,050	376
2006	0	16,000	8,800	0	0	0	2,355	156,500	523
2007	1	4,452	0	0	38	2	6,315	318	34

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	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	-	-
2006	-	-	-	-	532	-	-	-	-	

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	Niukluk River					Kwiniuk River				
Year[a]	Chinook	Chum	Pink	Pink & Chum[e]	Coho	Chinook[g]	Chum[g]	Pink[g]	Pink & Chum[e]	Coho[g]
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[h]	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[c]	-	1,095[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[k]	587	18,802	53,499	-	809 [i]
1992	-	7,770	803,200	-	812	479	12,077	1,464,717	-	532 [i]
1993	15	19,910	2,840	-	2,104	565	15,823	43,065	-	1,238 [i]
1994	7	16,470	1,294,100	-	274	627	33,010	2,304,099	-	2,547
1995	48	25,358	200	-	2,136	468	42,161	17,509	-	1,625 [i]
1996	25	9,732[c]	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	3,054,684	-	11,240
2005	6	3,225	154,000	-	-	342	12,083	341,048	-	12,950
2006	-	-	-	-	737	195	39,519	1,347,090-	-	22,341
2007	-	-	-	-	-	258	27,756	54,225	-	9,429

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	Tubutulik River					North River				
Year[a]	Chinook	Chum	Pink	Pink & Chum[e]	Coho	Chinook	Chum	Pink	Pink & Chum[e]	Coho
1962	3	-	-	16,690	-	162	-	-	16,087	-
1963	9	16,069	4,355	-	-	287[h]	-	-	73,274[h]	-
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[h]	1,240[h]	-	-
1971	-	16,820	7,500	5,065	-	256[h]	-	-	1,047[h]	-
1972	-	8,070	21,100	-	-	561[g]	2,332[d]	54,934[g]	-	-
1973	131	5,383	15,665	-	-	298[g]	4,332[d]	26,542[g]	-	-
1974	136	9,560	17,940	-	-	196[g]	826[d]	143,789[g]	-	-
1975[h]	7	17,141	38,003	-	-	60	5,237	17,885	-	-
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	21,616	663,937	-	-	61	2,300	127,900	-	204
1981	30	2,105	480			68	405	575	-	263
1982	49	2,044	53,605	-	-	8	599	168,902	-	4,145
1983	135[l]	16,345[l]	40,797[l]	-	-	347	4,135	4,980	-	-
1984	270	56,210	93,600	-	-	2,844[g]	2,915[g]	458,387[g]	-	152
1985[h]	472	13,645	8,940	-	-	1,426[g]	4,567[g]	4,360[g]	-	2,045[g]
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[h]	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	1,124,800	-	-	591	50	153,150	-	233
1999	-	-	-	-	-	18	1,480	3,790	-	533
2001	77	863	-	-	-	367	330	-	-	-
2002	42	180	182,000	-	-	122	217	4,590	-	800
2003	50	1,352	60	-	292	131	222	11,010	-	-
2004	321	1,117	391,000	-	779	189	283	264,000	-	1,386
2005	78	1,336	48,203	-	-	156	310	381,150	-	1,963
2007	823	7,045	32,250	-	4,552	554	295	50,100	-	2,349

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 A17.–Historical migration of salmon and Dolly Varden at Eldorado River counting tower, 1997–2002 and weir, 2003–2007.

Year	Operating Period	Chinook	Chum	Pink	Coho	Sockeye	Dolly Varden
1997	June 29 - Aug 19	98	14,302	1,022	194	n/a	n/a
1998	June 29 - Aug 12	446	13,808	137,283	21	n/a	n/a
1999	July 10 - Sept 01	28	4,218	977	510	n/a	n/a
2000	June 29 - Aug 25	33	11,617	55,992	192	n/a	n/a
2001	July 08 - Sept 13	50	11,635	488	1,509	n/a	n/a
2002	June 24 - Sept 10	26	10,215	119,098	540	10	377
2003	June 21 - Sept 08	29	3,591	173	115	0	60
2004	June 22 - Sept 09	25	3,277	60,866	1,151	57	0
2005	June 23 - Sept 02	32	10,369	12,356	689	10	23
2006	June 26 - Aug 03	41	42,105	222,348	55	1	65
2007	June 26 - Aug 06	14	21,312	833	2	22	60

Appendix A18.–Historical migration of salmon and Dolly Varden at Pilgrim River counting tower, 1997, and weir, 2003–2007.

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
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
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

[a] Chum and sockeye escapements were combined due to species identification problems during 1997.

[b] Coho were misidentified. Nearly 30% of scale samples in 2004 were actually sockeye.

Appendix A19.–Historical migration of salmon and Dolly Varden at Snake River counting tower, 1995–2002 and weir, 2003–2007.

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

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

Appendix A20.–Historical salmon migration at Kwiniuk River counting tower, 1965–2007.

Year[a]	Operating period	Chum	Pink	Chinook	Coho
1965	June 18 - Jul 19	32,861	8,668	19	
1966	June 19 - Jul 28	32,786	10,629	7	
1967	June 18 - Jul 28	26,661	3,587	13	
1968	June 18 - Jul 24	19,976	129,052	27	
1969	June 26 - Jul 26	19,687	56,683	12	
1970	June 25 - Jul 29	66,604	226,831		
1971	June 29 - Jul 29	38,679	16,634		
1972	June 28 - Jul 27	30,686	62,461	65	
1973	June 25 - Jul 25	28,029	37,070	57	
1974	June 20 - Jul 26	35,161	39,375	62	
1975	July 04 - Jul 26	14,049	55,293	44	
1976	July 04 - Jul 25	8,508	35,226	12	
1977	June 26 - Jul 25	21,798	47,934		
1978	July 04 - Jul 22	11,049	70,148		
1979	June 28 - Jul 25	12,355	167,492	107	
1980	June 22 - Jul 28	19,374	319,363	177	
1981	June 19 - Aug 02	34,565	566,534	136	
1982	June 21 - Jul 26	44,099	469,674	138	
1983	June 19 - Jul 27	56,907	251,965	267	
1984	June 19 - Jul 25	54,043	736,544	736 [b]	
1985	June 26 - Jul 28	9,013	18,237	955 [c]	
1986	June 19 - Jul 26	24,700	241,446	654	
1987	June 25 - Jul 23	16,133	5,566	317	
1988	June 18 - Jul 26	13,303	187,907	321	
1989	June 27 - Jul 27	14,529	27,488	248	
1990	June 21 - Jul 25	13,957	416,512	900	
1991	June 18 - Jul 27	19,801	53,499	708	
1992	June 27 - Jul 28	12,077	1,464,716	479	
1993	June 27 - Jul 27	15,824	43,063	600	
1994	June 23 - Aug 09	33,012	2,303,114	625	2,547
1995	June 21 - Jul 26	42,500	17,511	498	114
1996	June 20 - Jul 25	28,493	907,893	577	461
1997	June 18 - Jul 27	20,119	9,535	974	
1998	June 18 - Jul 27	24,247	655,934	303	
1999	June 25 - Jul 28	8,763	607	116	
2000	June 22 - Jul 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

Note: Data not available for all species in all years.

[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 A21.–Historical salmon migration at Niukluk River counting tower, 1995–2007.

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 09	45,588	1,624,438	260	840
1999	June 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

Appendix A22.–Historical salmon migration at Nome River counting tower, 1993–1995, and weir, 1996–2007.

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 - Jul 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

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

Appendix A23.–Historical sockeye salmon migration at Glacial Lake weir, 2001–2007.

Year	Operating period	Sockeye
2001	July 02 - July 28	2,487
2002	June 25 - July 26	1,047
2003	June 24 - July 28	2,004
2004	June 18 - July 25	8,115
2005	June 20 - July 25	11,135
2006	July 04 - July 18	6,849
2007	July 05 - July 20	4,533

Appendix A24.–Historical salmon and Dolly Varden migration at Pikmiktalik River counting tower, 2003–2007.

Year	Operating period	Chum	Pink	Chinook	Coho	Dolly Varden
2003	June 19 - July 27	7,707	13,165	345	87	527
2004	June 18 - Aug 31	8,051	50,621	225	11,799	616
2005	June 21 - Sept 07	8,824	56,469	153	17,718	123
2006	June 25 - Sept 10	12,711	45,938	99	9,376	837
2007	June 27 - Sept 07	21,080	21,489	123	13,522	192

Appendix A25.–Historical salmon migration at North River counting tower, 1972–1974, 1984–1986, and 1996–2007.

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	2,263	4,792
2000	June 17 - Aug 12	4,971	69,703	1,046	6,961
2001	July 05 - Sept 15	6,515	24,737	1,337	12,383
2002	June 19 - Aug 29	6,143	324,595	1,505	3,210
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	8,046	583,320	1,950	19,944

Appendix A26.–Total escapement for chum, pink, coho, and Chinook salmon for Kwiniuk, Niukluk, Nome, and Snake Rivers (starting 1995), North River (starting 1996), and Eldorado River (starting 1997).

Year	Chum	Pink	Coho[a]	Chinook
1995	138,317	49,409	7,333	626
1996[b]	124,571	2,535,593	16,175	2,027
1997	109,945	163,728	11,434	5,550
1998	98,166	3,070,848	4,496	3,179
1999	55,352	73,077	10,069	2,470
2000	65,007	1,883,867	19,680	1,324
2001	70,451	79,706	30,645	1,718
2002	94,156	2,242,404	21,869	2,946
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	171,406	5,763,830	56,484	1,256
2007	123,289	711,054	37,091	2,326

[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.

Appendix A27.–Total escapement (6 rivers) and catch (commercial, subsistence, and sport) for chum, pink, coho, and Chinook salmon for Norton Sound, 1995–2007.

Year[a,b]	Chum	Pink	Coho	Chinook
1995	221,318	169,965	79,989	17,198
1996[c]	168,382	3,091,438	117,486	14,918
1997[d]	168,829	192,294	64,378	28,218
1998[d]	135,204	3,717,733	57,567	19,493
1999	82,841	96,033	42,656	11,752
2000	89,537	2,091,609	88,594	7,113
2001	103,474	110,319	69,482	7,778
2002	113,391	2,311,060	42,925	9,222
2003	63,099	441,385	45,304	7,445
2004	50,886	6,511,810	87,125	6,977
2005	77,565	2,648,981	145,411	5,202
2006	187,784	5,825,726	215,961	4,570
2007[e]	157,768	735,862	175,229	4,991

[a] Kwiniuk, Niukluk, Nome, and Snake Rivers (starting 1995), North River (starting 1996), and Eldorado River (starting 1997).

[b] Not all subdistricts from 2004 to present 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 Gamble.

[e] Information not yet available from Division of Sport Fish.

Appendix A28.–Aerial survey numbers of chum, pink, coho, and Chinook salmon for Norton Sound, 1985–2007.

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	459,258	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	3,148,390	29,930	195
2007	54,522	147,081	18,512	1,645

[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.

APPENDIX B.

Appendix B1.–Comparative sockeye salmon aerial survey indices, Port Clarence District, 1963–2007.

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

[a] Poor survey.

[b] No survey made.

[c] Boat survey.

[d] Early count.

Appendix B2.–Subsistence surveys conducted in Port Clarence District 1963–1983, 1989, and 1994–2007.

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	181	1,979	1,692	3,849	2,042	9,743
1995 [e]	122	76	4,481	1,739	3,293	6,011	15,600
1996 [e]	117	195	4,558	2,079	2,587	1,264	10,684
1997 [e]	126	158	3,177	829	755	2,099	7,019
1998 [e]	138	287	1,665	1,759	7,812	2,621	14,144
1999 [e]	155	89	2,392	1,030	786	1,936	6,233
2000 [e]	134	72	2,851	935	1,387	1,275	6,521
2001 [e]	160	84	3,692	1,299	1,183	1,910	8,167
2002 [e]	159	133	3,732	2,194	3,394	2,699	12,152
2003 [e f]	204	177	4,495	1,434	4,113	2,430	12,649
2004 [g]	376 [h]	276	8,288	1,031	5,817	2,501	17,913
2005 [g]	335 [h]	152	8,492	726	6,615	2,479	18,464
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

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

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

Appendix C1.–Kotzebue District chum salmon catch statistics, 1962–2007.

Year	Total Catch	Number of Fishers [a]	Season Catch per Fisher
1962	129,948	84	1,547
1963	54,445	61	893
1964	76,449	52	1,470
1965	40,025	45	889
1966	30,764	44	699
1967	29,400	30	980
1968	30,212	59	512
1969	59,335	52	1,141
1970	159,664	82	1,947
1971	154,956	91	1,703
1972	169,664	104	1,631
1973	375,432	148	2,537
1974 [b]	627,912	185	3,394
1975 [c]	563,345	267	2,110
1976	159,796	220	726
1977	195,895	224	875
1978	111,494	208	536
1979	141,623	181	782
1980	367,284	176	2,087
1981	677,239	187	3,622
1982	417,790	199	2,099
1983	175,762	189	930
1984	320,206	181	1,769
1985	521,406	189	2,759
1986	261,436	187	1,398
1987	109,467	160	684
1988	352,915	193	1,829
1989	254,617	165	1,543
1990	163,263	153	1,067
1991	239,923	142	1,690
1992	289,184	149	1,941
1993 [d]	73,071	114	641
1994 [e]	153,452	109	1,408
1995	290,730	92	3,160
1996 [f]	82,110	55	1,493
1997	142,720	68	2,099
1998	55,907	45	1,242
1999	138,605	60	2,310
2000	159,802	64	2,497
2001 [g]	211,672	66	3,207
2002	8,390	3	2,797
2003 [h]	25,423	4	6,356
2004	51,038	43	1,187
2005	75,971	41	1,853
2006	137,961	42	3,285
Ave. 1962–2006	197,060	117	1,813
2007	147,087	46	3,198

[a] During 1962–1966 and 1968–1971, figures represent number of vessels licensed to fish in the Kotzebue District, not number of fishers.
[b] Includes 6,567 chum salmon from the Deering experimental fishery.
[c] Includes 10,704 chum salmon from Deering experimental fishery.
[d] Includes 2,000 chum salmon from the Sikusuilaq Springs Hatchery terminal fishery.
[e] Includes 4,000 chum salmon commercially caught but not sold.
[f] Includes 2,200 chum salmon commercially caught but not sold.
[g] Includes 10 chum salmon commercially caught but not sold.
[h] An additional 340 chum salmon from the commercial catch were kept for subsistence use.

Appendix C2.–Kotzebue District chum salmon type of processing and weights, 1962–2007.

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

Note: Data not available for all years.

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

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

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

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

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

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

[g] There were 9 Chinook, 5 sockeye, and 3 pink salmon, and 278 Dolly Varden and 13 sheefish kept for personal use.

[h] There were 15 Chinook, 2 chum, 3 pink and 2 coho salmon, and 960 Dolly Varden and 13 sheefish kept for personal use.

Appendix C3.–Kotzebue District mean prices paid per pound in dollars to salmon fishers by species, 1962–2007.

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

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

[b] Price per fish.

[c] Includes price paid to fishers 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, 1962–2007.

Year	Gross Value of Catch to Fishers [a]
1962	4,500
1963	9,140
1964	34,660
1965	18,000
1966	25,000
1967	28,700
1968	46,000
1969	71,000
1970	186,000
1971	200,000
1972	260,000
1973	925,000
1974 [b]	1,822,784
1975 [c]	1,365,648
1976	580,375
1977	1,033,950
1978	575,260
1979	990,263
1980	1,446,633
1981	3,246,793
1982	1,961,518
1983	420,736
1984	1,148,884
1985	2,137,368
1986	931,241
1987	515,000
1988	2,581,333
1989	613,823
1990	438,044
1991	437,948
1992	533,731
1993 [d]	235,061
1994	233,512
1995	316,031
1996	56,310
1997	187,978
1998	70,587
1999	179,781
2000	246,789
2001	322,650
2002	7,572
2003	26,377
2004	64,420
2005	124,820
2006	229,086
Average 1962–2006	597,562
2007	243,149

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

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

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

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

Appendix C5.–Kotzebue District commercial and subsistence salmon catches, 1914–1918, and 1957–2007.

	Commercial Catch			Subsistence Chum Salmon Catch			
Year[a]	Chum [b]	Other [c]	Total	Chum	Number of Fishers Interviewed	Average Catch per Fisher	Total Documented Catch
1914	8,550		8,550				
1915	4,750		4,750				
1916	19,000		19,000				
1917	44,612		44,612				
1918	27,407		27,407				
1957				298,430 [d]			
1962	129,948	27	129,975	70,284	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]		30,384	20,814	65	320	51,198
1969	59,335	48	59,383	29,812	99	301	89,195
1970	159,664		159,664	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	634,527	26,744	88	304	661,271
1975	563,682 [g]	36	563,718	27,605	95	291	591,323
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	224	186,278
1984	320,206	107	320,313	15,420 [h]	66	234	335,733
1985	521,406	63	521,469	31,478 [i]	243	130	552,947
1986	261,436	106	261,542	50,458	837	60	312,000
1987	109,467	44	109,511	9,988	[j]	[j]	119,499

-continued-

Appendix C5.–Page 2 of 2.

	Commercial Catch				Subsistence Chum Salmon Catch				
Year	Chum	Other [c]	Total		Chum	Number of Fishers Interviewed	Average Catch per Fisher	Total Documented Catch
1988	352,915	152	353,067		13,723	[j]	[j]	366,790
1989	254,617	87	254,704		5,489	[j]	[j]	260,193
1990	163,263	32	163,295		8,268	[j]	[j]	171,563
1991	239,923	44	239,967		14,740	[j]	[j]	254,707
1992	289,184	204	289,388		14,303	[j]	[j]	303,691
1993	73,071 [k]	131	73,202		15,430	[j]	[j]	88,632
1994	153,452 [l]	3	153,455		36,226 [m]	375	97	189,681
1995	290,730	5	290,735		102,881	593	173	393,616
1996	82,110 [n]	3	82,113		99,740	596	167	181,853
1997	142,720	45	142,765		57,906	530	109	200,671
1998	55,907	210	56,117		48,980	592	83	105,097
1999	139,120	5	139,125		94,342	353	267	233,467
2000	159,802	10	159,812		65,975	422	156	225,787
2001	211,672	6	211,678		49,232	408	121	260,910
2002	8,390	0	8,390		16,880 [m,o]	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.			
1979-2006 Average	196,649	155	203,585	1994-2004 Average	56,000	450	124	176,070
2007	147,087	20	147,107		2007 subsistence surveys were not conducted.			

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.

	Village					Kobuk River	Noatak	Village						District
Year	Noorvik	Kiana	Ambler	Shungnak	Kobuk	Villages	Village	Kotzebue	Deering	Kivalina	Buckland	Candle	Shishmaref	Total
1962	15,934	3,139	[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,c]	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,d]	277	223	1,062	3,556	368	5,486	4,035	347	219	200	[a]	[a]	[a]	10,287
1984[b,e]	[a]	[a]	2,990	4,241	[a]	7,231	6,049	88[b]	1,940	200	[a]	[a]	[a]	15,420
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	102,881
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

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	Village					Kobuk River	Noatak	Village						District
Year	Noorvik	Kiana	Ambler	Shungnak	Kobuk	Villages	Village	Kotzebue	Deering	Kivalina	Buckland	Candle	Shishmaref	Total
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 after 2004.

[a] Not surveyed.

[b] No household survey; information is from return of mail 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. 2003).

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

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

Note: No subsistence surveys were conducted after 2004.

[a] Not surveyed.

[b] Number of fishers not known.

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

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

APPENDIX D.

Appendix D1.–Norton Sound herring and spawn-on-kelp harvests (in tons) by U.S. commercial fishers, 1909–2007.

Year	Sac Roe Herring	Food or Bait Herring	Total	Spawn on Kelp
1909–1916 [a]	-	-	-	-
1916–1928	-	1,881	1,881	-
1929	-	166	166	-
1930	-	441	441	-
1931	-	86	86	-
1932	-	529	529	-
1933	-	31	31	-
1934	-	4	4	-
1935	-	15	15	-
1936	-	-	-	-
1937	-	6	6	-
1938	-	10	10	-
1939	-	6	6	-
1940	-	14	14	-
1941	-	3	3	-
1942–1963	-	-	-	-
1964	20	-	-	-
1965	-	-	-	-
1966	12	-	-	-
1967	-	-	-	-
1968	-	-	-	-
1969	2	-	-	-
1970	8	-	-	-
1971	20	-	-	-
1972	17	-	-	-
1973	35	-	-	-
1974	2	-	-	-
1975	-	-	-	-
1976	9	-	-	-
1977	11	-	-	trace
1978	15	-	-	4
1979	1,292	-	-	13
1980	2,451	1	2,452	24
1981	4,371	-	-	47 [b]
1982	3,864	69	3,933	38
1983	4,181	401	4,582	29 [c]
1984	3,298	274	3,572	19 [d]
1985	3,420	128	3,548	- [e]
1986	4,926	268	5,194	-
1987	3,779	303	4,082	-
1988	4,256	416	4,672	-
1989	4,494	247	4,741	-

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Year	Sac Roe Herring	Food or Bait Herring	Total	Spawn on Kelp
1990	5,253	1,026	6,279	-
1991	5,465	207	5,672	-
1992 [f]	-	-	-	-
1993	4,713	321	5,034	-
1994	958	2	960	-
1995	6,647	116	6,763	-
1996 [g]	6,061	109	6,220	-
1997 [h]	3,709	262	3,976	-
1998	2,623	8	2,631	9.04 [i]
1999	2,693 [j]	53	2,751	3.74
2000	4,487 [k]	-	4,487	2.25
2001	2,245	-	2,245	2.20
2002	1,059	64	1,123	-
2003	1,587	21	1,608	0.88
2004 [f]	-	11	11	-
2005	1,951	-	1,951	-
2006	646	25	671	0.57
2007 [f]	-	33	33	0.14

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

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

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

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

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

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

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

[h] Total includes an estimate 5 st of wastage. Includes approximately 1,000 lbs taken as bait.

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

[j] Includes an estimate 5 st of wastage.

[k] Includes an estimate 15 st of wastage.

Appendix 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). Two vessels apprehended.
1970	69	
1971	703	
1972	15	
1973	38	
1974	764	
1975	-	
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, 1979–2007.

Year	Estimated Biomass (tons)	Catch Gillnet (tons)	Beach Seine (tons)	Wild Kelp (tons)	*Macrocystis* Kelp (lbs.)	Number of Fishers	Dollar Value (millions)	Number of Buyers	Average Roe %	Peak Catch Day	Fishery Duration
1979	7,700	1,292	0	13		67	0.6	7	7.0	25-May	19-May/14-June
1980	8,400	2,452	0	24		294	0.5	8	8.1	30-May	21-May/05-June
1981	25,100	4,371	0	47		332	1.5	13	8.8	24-May	18-May/28-May
1982	19,403	3,933	0	38		237	1.0	7	8.8	08-June	03-June/11-June
1983	28,100	4,541	41	29		272	1.4	9	8.6	23-May	18-May/28--May
1984	23,100	3,245	327	16	6,000	194	0.9	8	10.3	10-June	06-June/28-May
1985	20,000	3,379	169			277	1.4	11	9.9	20-June	13-June/21-June
1986	28,100	4,979	215			323	2.9	10	9.6	09-June	03-June/10-June
1987	32,370	3,759	323			564	2.6	11	8.6	07-June	07-June/08-June
1988	33,924	4,474	198			348	3.9	11	9.0	28-May	27-May/31-May
1989	25,981	4,351	390			357	2.3	9	9.2	28-May	27-May/30-May
1990	39,384	6,032	347			365	3.6	8	8.8	29-May	28-May/30-May
1991	42,854	5,150	522			279	2.4	8	9.3	25-May	23-May/25-May
1992[a]	57,974	0	0				0.0			20-June[b]	
1993	46,549	4,291	742			264	1.5	5	9.9	25-May	24-May/05-June
1994	31,088	921	40			215	0.3	6	10.3	08-June	05-June/09-June
1995	37,779	6,033	614			215	4.2	6	10.4	24-May	23-May/30-May
1996	26,596	5,581	589			287	4.5	10	10.6	25-May	24-May/25-May
1997	47,748	3,459	513			220	0.61	9	9.9	22-May	20-May/24-May
1998	52,033	2,632	0	1	16,083	47	0.20	2	9.2	25-May	22-May/09-June
1999	34,314	2,755	0		7,482	122	0.61	4	10.5	17-June	13-June/22-June
2000	32,680	4,390	81		4,500	97	0.89	4	9.5	11-June	07-June/15-June
2001	26,305	2,245	0		4,400	76	0.35	3	12.3	12-June	12-June/16-June
2002	27,068	1,123	0		0	46	0.16	2	10.6	24-May	22-May/03-June
2003	32,918	1,608	0		1,750	32	0.22	2	10.5	18-May	16-May/25-May
2004[a]	34,180	11	0	0	0	4	0.00	0		24-May[b]	
2005	43,013	1,951	0	0	0	56	0.32	1	11.4	04-June	03-June/10-June
2006	24,635[c]	671[d]	0	0.57	0	41	0.14	1	10.2	09-June	08-June/11-June
2007[a]	28,033	33	0	0.14	0	7	0.02	1		09-June	09-June/15-June

[a] No fishery due to late sea ice breakup in 1992 and no sac roe fishery in 2004 and 2007 due to lack of a buyer.

[b] Date of peak aerial survey biomass estimate, typically one or 2 days prior to peak catch.

[c] Biomass estimate does not include surveys of subdistricts 4-7 due to lack of funding and ice conditions.

[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, 1979–2007.

	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

[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 lbs 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 sac roe total due to dewatering by buyers. 3 tons added to 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 E.

Appendix E1.–Historical commercial summer harvest of red king crab from Norton Sound Section, Eastern Bering Sea, by statistical areas, 1977–2007 (catch in pounds).

Statistical Area	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
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		79,006
656401			138,011	121,147	253,387	60,480	11,422	183,119	246,200		194,408
656402	306,302	90,187	288,869	918	3,098	2,832			132,363		
666230		55,490			77						
666300		162,795	60,816	84,874	9,167	95		4,534			
666330		353,016	505,050	367,446	141,513	8,990	1,192		389	70,615	2,963
666401		179,212	486,947	205,400	381,510	79,580	325,045	116,254	5,341	408,848	50,744
666402	12,036	515,778	534,938	183,581		17,585			32,992		
666431			146,029								
676300		13,238		126,231							
676330		51,304	81,798	6,762	18,734						
676400		667,130	33,856	274	92,026	1,315	247		32		
676430		3,811	12,309		373	3,513			1,171		
676501					36						
686330			1,860								
Totals (tons)	259	1,046	1,466	593	690	114	184	194	214	240	164

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Statistical Area	1988	1989	1990	1991[a]	1992	1993	1994	1995	1996[b]	1997	1998
616331							48				
616401								35			
626331									61		
626401								18,971	45,045	18,066	8,065
626402											
636330									4,560	3,838	2,449
636401		22,030			1,159	1,373	8,087	24,329	70,677	59,206	10,771
636402							1,754	3,466			
646301								4,628	13,888		
646330		5,212						1,493	2,894	314	
646401						1,963	37,222	105,045	22,834	1,052	3,194
646402						730	143,511	66,821			
656300											
656330	36,129	1,757			4,814	265		19,745	15,446	4,661	4,078
656401	165,644	100,956	171		53,119	105,341	29,566	32,289	9,985	4,035	1,127
656402						193,079	106,053	44,000			
666230											
666300									25,519		
666330	13,020	1,275	27,185		4,305	31,758		730			
666401	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											
Totals (tons)	118	123	96		37	168	164	161	112	46	15

-continued-

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Statistical Area	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
616331	633	4,557		3,506	646			2357		19,640
616401									231	266
626331				2,455				1415	27,018	70,991
626401	508	4,689	61,620	53,722	15,899	23,113	94,130	118202	61,704	552,470
626402					1,352					40,347
636330			2,253				126	26680	10,253	47,710
636401	14,201	126,994	91,343	50,906	83,949	166,489	227,204	224531	123,092	1,408,849
636402										5,220
646301										18,516
646330	3,021		1,868	1,955		2,226	4,097	2629	5,290	35,715
646401	221		4,287		3,952	1,964	149	1660		355,172
646402										292,779
656300					14	932		284	1,909	180,012
656330	1,300		20,869	12,374	21,176	46,288	47,411	17752	4,911	1,166,153
656401	2,739	94,813	55,158	63,038	40,566	21,579	9,405	28434	70,065	1,900,669
656402					1,441		380	807	2,254	1,172,583
666230								1721		57,288
666300								18245		366,045
666330		5,839	7,030	1,332	1,296	12,359	142	5041	511	1,560,034
666401	930	60,762	43,771	35,970	83,998	42,452	727	600	2,498	2,775,851
666402				30,070	12,873	23,344	16,025	1050	2,959	1,384,987
666431				4,274	45					151,472
676300										140,015
676330										158,598
676400									180	808,047
676430										21,177
676501							1,008			1,044
686330										1,860
686431								340		340
Totals (tons)	12	149	144	130	134	170	200	226	156	

Note: Data not available or no harvests were recorded for all statistical areas or years.

[a] No commercial fishery occurred in 1991.

[b] Does not include approximately 2,490 lbs 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-two males [b]	Pre-one Males [b]	Legal Males [c]	Legal Male Biomass (millions of lbs.)
1976	9/02-9/05, 9/16-10/7	NMFS	Trawl	331,555	808,091	1,742,755	5,228,265
1979 [d]	7/26 - 8/05	NMFS	Trawl			809,799	2,429,397
1980 [e]	7/04 - 7/14	ADF&G	Pots			1,900,000	5,700,000
1981	6/28 - 7/14	ADF&G	Pots			1,285,195	3,855,585
1982	7/06 - 7/20	ADF&G	Pots			353,273	1,059,819
1982	9/05 - 9/11	NMFS	Trawl	356,724	832,581	877,722	2,633,166
1985	7/01 - 7/14	ADF&G	Pots			907,579	2,722,737
1985	9/16 - 10/1	NMFS	Trawl	466,858	707,140	1,051,857	3,155,571
1988	8/16 - 8/30	NMFS	Trawl	565,255	493,030	978,748	2,936,244
1991	8/22 - 8/30	NMFS	Trawl	294,801	303,682	1,287,486	3,862,458
1996	9/07 - 9/18	ADF&G	Trawl	452,580	325,699	536,235	1,608,705
1999	7/28 - 8/07	ADF&G	Trawl	103,832	940,198	1,594,341	4,783,023
2002	7/27 - 8/06	ADF&G	Trawl	427,703	518,638	771,569	2,314,707
2006	7/25 - 8/08	ADF&G	Trawl	775,076	569,833	726,251	2,178,753

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-two 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 legals 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-two male and pre-one male data is unavailable for the 1979 NMFS trawl survey.

[e] The 1980 pot survey estimate has been revised from the original estimate of 13.4 million pounds which was thought inaccurate due to an under-reporting of recovered tagged crab.

Appendix E3.–Historical summer commercial red king crab fishery economic performance, Norton Sound Section, Eastern Bering Sea, 1977–2007.

Year	Guideline Harvest Level (lbs) [b]	Legal Male Population Est. No. crab (millions)	Legal Male Population Est. lbs [b]	Commercial Harvest (lbs) [a, b] Open Access	Commercial Harvest (lbs) [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	3.8	8/01-8/05
1984	0.40			0.39		8	8	21	1,245	9,706	1.02	0.395	13.6	8/01-8/15
1985	0.45	1.1	3.3	0.43		6	6	72	1,116	13,209	1.00	0.427	21.7	8/01-8/23
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]	9.9	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]
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]

[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 fishers' 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.

Appendix E4.–Percentage of recruit and postrecruit male red king crab from summer commercial fishery catch samples in Norton Sound Section, Bering Sea, 1977–2007.

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

[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, 1978–2007.

Commercial			Subsistence						
Year [a]	Number of Fishers	No. Crab Harvested	Winter[b]	No. Permits Issued	No. Permits Returned	No. Permits Fished	Total Crab Caught [c]	Total Crab Harvested[d]	Average No./ Permits Fished
1978	37	9,625	1977–1978	290	206	149	[e]	12,506	84
1979	[f]	[f]	1978–1979	48	43	38	[e]	224	6
1980	[f]	[f]	1979–1980	22	14	9	[e]	213	24
1981	0	0	1980–1981	51	39	23	[e]	360	16
1982	[f]	[f]	1981–1982	101	76	54	[e]	1,288	24
1983	5	549	1982–1983	172	106	85	[e]	10,432	123
1984	8	856	1983–1984	222	183	143	15,923	11,220	78
1985	9	1,168	1984–1985	203	166	132	10,757	8,377	63
1986	5	2,168	1985–1986	136	133	107	10,751	7,052	66
1987	7	1,040	1986–1987	138	134	98	7,406	5,772	59
1988	10	425	1987–1988	71	58	40	3,573	2,724	68
1989	5	403	1988–1989	139	115	94	7,945	6,126	65
1990	13	3,626	1989–1990	136	118	107	16,635	12,152	114
1991	11	3,800	1990–1991	119	104	79	9,295	7,366	93
1992	13	7,478	1991–1992	158	105	105	15,051	11,736	112
1993	8	1,788	1992–1993	88	79	37	1,193	1,097	30
1994	25	5,753	1993–1994	118	95	71	4,894	4,113	58
1995	42	7,538	1994–1995	166	131	97	7,777	5,426	56
1996	9	1,778	1995–1996	84	44	35	2,936	1,679	48
1997	[f]	[f]	1996–1997	38	22	13	1,617	745	57
1998	5	984	1997–1998	94	73	64	20,327	8,622	135
1999	5	2,714	1998–1999	95	80	71	10,651	7,533	106
2000	10	3,045	1999–2000	98	64	52	9,816	5,723	107
2001	3	1,098	2000–2001	50	27	12	366	256	21
2002	11	2,591	2001–2002	114	101	67	8,805	3,669	55
2003	13	6,853	2002–2003	107	73	64	9,052	4,140	65
2004[g]	2	522	2003–2004	96	77	41	1,775	1,181	29
2005	4	2,121	2004–2005[h]	170	102	60	6,496	3,973	66
2006	[f]	[f]	2005-2006	98	97	67	2,083	1,239	18
2007	8	3,313	2006-2007	129	127	116	21,444	10,690	92
Avg 1978–2006	9	2,357	Avg 1977–2006	118	92	69	8,049	5,067	64

[a] Prior to 1985 the winter commercial fishery occurred from January 1–April 30; as of March 1985, fishing may occur from November 15–May 15.

[b] The winter subsistence fishery occurs during months of 2 calendar years (as early as December through May).

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

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

[e] Information not available.

[f] Confidential under AS 16.05.815.

[g] Confidentiality was waived by the fishers.

[h] Permits were only given out of the Nome ADF&G office, except during the 2004-5 season, when permits were also given out in Elim, Golovin, Shaktoolik, and White Mountain.

Appendix E6.–Size composition by percent of red king crab from winter research pots near Nome, Norton Sound, Bering Sea, 1983–2007.

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

[a] Sublegals = male crabs less than 4 3/4" carapace width. Legals = male king crabs greater than 4 3/4" 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.

APPENDIX F.

Appendix F1.–Kotzebue District winter commercial sheefish harvest statistics, 1967–2007.

Year	[b]	Number of Fishers	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	[e]						
2007	[e]						

[a] Data is 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 Fishers Interviewed	Reported Harvest	Average Catch per Fisher
1966-1967	135	22,400	166
1967-1968	146	31,293	214
1968-1969	144	11,872	82
1970	168	13,928	83
1971	155	13,583	88
1972	79	3,832	49
1973	65	4,883	75
1974	58	1,062	18
1975	69	1,637	24
1976	57	966	17
1977	95	1,810	19
1978	95	1,810	19
1979	75	3,985	53
1980	74	3,117	42
1981	62	6,651	107
5/82-4/83 [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]	16
2004 [h]	440	10,163	20

Note: Subsistence surveys were not conducted from 1988–1990 and after 2004.

[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 after 2004.

[c] Catch by village for these years are 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, 1978-2007.

	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	2,968	595	239	269	393
2006	3,180	419	2,198	760	810
2007	Harvest data is not yet available for 2007.				
Average					
1997–2006	4,279	1,054	1,127	1,389	1,031
2002–2006	3,650	1,036	1,228	1,296	1,169

Note: Data not available for all years.

Appendix F4.–Kotzebue District incidentally caught and sold Dolly Varden during the commercial salmon fishery, 1966–2007.

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	
1990	604	[h]	4,219	7.0	0.25
1991	6,136	[h]	40,747	6.6	0.18
1992	1,977	[h]	11,951	6.0	0.10
1993	76	[h]	540	7.1	0.10
1994	149	[h]	767	5.1	0.17
1995	2,090	[h]	13,195	6.3	0.20
1996	188	[h]	1,153	6.1	0.25
1997	3,320	[h]	23,203	7.0	0.20
1998	349	[h]	2,640	7.6	0.20
1999	1,502	[h]	11,352	7.6	0.20
2000	7	[h]	44	6.3	0.20
2001	0	[h]	0		
2002	0	30	0		
2003	20	176	160	8.0	0.50
2004	124	[h]	846	6.8	0.26
2005	181	[h]	1,158	6.4	0.30
2006	0	278	0	[i]	0.00
2007	0	960	0	[i]	0.00

Note: Data not available for all years.

[a] Estimate includes fish caught but not sold based on interviews of fishers 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, 1959–2004.

Year	Kivalina		Noatak
	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 [c]		2,676 [d, f]
1983	16,270 [e]		4,545
1984	12,000 [e]		2,542
1985	10,500 [e]		
1986	7,436 [e]		46 [h]
1987 [g]			1,376 [h]
1988			
1989			
1990			
1991 [g]			4,814
1992 [g]			4,395
1993 [g]			4,275
1994			
1995 [g]			5,762
1996 [g]			5,031
1997 [g]			4,763
1998 [g]			3,872
1999			
2000 [g]			3,315
2001 [g]			2,702
2002 [g]			3,242
2003 [g]			5,670
2004 [g]			10,914

Note: Subsistence surveys were not conducted in 1961, 1964–1967, 1974–1978, and after 2004.

[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 1982).

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

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

Appendix F6.–Dolly Varden sport fish harvests in Norton Sound, by river, 1988–2007.

	Areas									
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	Harvest data is not yet available for 2007.									
Average 1997-2006	199	528	96	1,570	770	236	54	111	580	4,144
2002-2006	47	694	113	1,265	327	295	22	45	772	3,580

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 1976–2007.

		Overwintering	
Year [a]	Noatak River Spawner Survey [b]	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]	100,806	[f]
2005	[f]	120,848	[f]
2006	[f]	108,352	[f]
2007	[f]	99,311	[f]

Note: Data not available for all years.

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

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

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

Note: Subsistence surveys were not conducted after 2004.

[a] Whitefish harvest information was collected during chum salmon subsistence surveys and is considered a fraction of the annual catch.

[b] Data unavailable.

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

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

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

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

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

APPENDIX G.

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

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

Appendix G2.–Alaska Department of Fish and Game and associated cooperative studies conducted within the Norton Sound, Port Clarence, and Kotzebue Districts, 2007.

HERRING

Herring Test Fishing

a) Location: Norton Sound ocean waters; field camp at Cape Denbigh.

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

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 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 commercial catch for age and size at Unalakleet. ADF&G 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. ADF&G project with additional funding from Norton Sound Initiative (NSI) and NSEDC.

Niukluk River Tower

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

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

-continued-

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 Unalakleet IRA, NSEDC, and ADF&G.

Eldorado River Weir

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

b) Description: Determine daily and seasonal timing and magnitude of chum and pink salmon escapements. Midseason, counting tower converted to a fixed weir. Cooperative project operated by Kawerak Inc. with assistance from ADF&G, and funded by Kawerak Inc. and NSEDC.

Glacial Lake Weir

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. Cooperative project by NSEDC and ADF&G.

Nome River Weir

a) Location: Nome River, approximately 1 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 NSI and NSEDC.

Pilgrim River Weir

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

b) Description: Determine daily and seasonal timing and magnitude of the salmon escapements. Cooperative project operated by Kawerak Inc. with assistance from ADF&G and NSEDC.

-continued-

Snake River Weir

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

b) Description: Determine daily and seasonal timing and magnitude of salmon escapements. Cooperative project operated by Kawerak Inc. with assistance from ADF&G, and funded by Kawerak Inc. and NSEDC.

Salmon Lake Limnology Project / Sockeye Salmon Restoration

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

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

Nome River Coho Salmon Smolt Abundance

a) Location: Nome River, throughout.

b) Description: Trap and tag coho salmon smolt to estimate abundance. To determine juvenile coho salmon seasonal migration patterns from fresh to marine waters, and changes in seasonal juvenile body length, weight, and condition. NSEDC and LGL project.

Hobson Creek Incubation Project

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

b) Description: Incubation facility for supplemental salmon production. Chum and coho salmon eggs were taken in 2007 and incubated over the winter. Nome Fishermen's Association project with funding from NSEDC. Land leased by ADF&G from Sitnasuak Native Corporation. ADF&G facility provided.

Mist Incubation and Egg Planting Project

a) Location: Snake and Solomon Rivers.

b) Description: Collection of chum salmon eggs from Solomon and Snake Rivers. Eggs where incubated and planted in both rivers. Collection of coho salmon eggs from the Snake River. Eggs were incubated and planted in Moonlight Springs off of the Snake River. NSEDC project.

-continued-

Subsistence Salmon Fishing Surveys

a) Location: Norton Sound District.

b) Description: Determine subsistence utilization of salmon for formulating management procedures and goals. Subsistence salmon permits were issued in northern Norton Sound and Port Clarence Districts by the Division of Commercial Fisheries. Saint Michael, Shaktoolik, Stebbins, and Unalakleet were surveyed by Commercial Fisheries Division. ADF&G project.

CRAB

Near shore Winter King Crab Study

a) Location: Ocean waters of Norton Sound, 1 to 1.5 miles south of Nome and 7 miles west to 5 miles east of Nome.

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

Norton Sound Red King Crab Trawl Survey (Conducted in 2006, next survey 2008)

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. ADF&G project with financial assistance from the National Oceanic and Atmospheric Administration (NOAA).

Appendix G3.–Commercial processors and buyers operating in Norton Sound, Port Clarence, and Kotzebue Sound, 2007.

Company	Address	Type of Processing	District
Aqua Tech	P.O. Box 10119 Anchorage, AK 99510	Fresh Crab	Norton Sound
Norton Sound Seafoods	Nome, AK 99762 and Unalakleet, AK 99684	Frozen/Fresh Salmon Herring Roe King Crab	Norton Sound
Great Pacific	Anchorage, AK	Buy and Fly	Kotzebue Sound

Appendix G4.–Norton Sound subsistence salmon harvest survey form, 2007.

NORTON SOUND 2007 SUBSISTENCE SALMON HARVEST SURVEY Community ID#_____
Alaska Department of Fish and Game Household ID#_____

Community: _____
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? o YES o NO
   (Include fishing with a rod and reel)
2. Does your household usually subsistence fish for salmon? o YES o NO

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

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

	Number of Salmon your household harvested (by gear type)			Of your TOTAL harvest, how many salmon were caught JUST for dog food?
SPECIES	Subsistence gill net or seine (# of fish)	Rod & Reel (# of fish)	Kept from commercial fishing (# of fish)	(# of fish)
Chum salmon (dog)				
Chinook salmon (king)				
Pink salmon (humpy)				
Sockeye salmon (red)				
Coho salmon (silver)				

4. How was subsistence chum salmon fishing for your household this year ?
   o VERY GOOD o AVERAGE o POOR
   IF POOR, why? _____
5. Does anyone in your household trade or barter subsistence-caught fish with people in other households or communities?
   o YES o NO
6. Comments or Suggestions?

RED KING CRAB

Emergency Order: 3-C-Z-01-07 Effective Date: June 15, 2007

EXPLANATION: This emergency order opens the commercial CDQ crab fishery in Norton Sound from 12:00 noon Friday, June 15 until 12:00 noon Thursday, June 28.

JUSTIFICATION: The guideline harvest level for the 2007 Norton Sound crab fishery is 315,000 pounds. By regulation, the CDQ fishery is allocated 7.5% of the summer season harvest. Therefore, the CDQ harvest quota is set at 23,625 pounds. Only fishers designated by the Norton Sound and Yukon Delta CDQ groups are allowed to participate in this portion of the king crab fishery. Fishers must have a CDQ fishing permit from Commercial Fisheries Entry Commission and register with Nome or Unalakleet ADF&G prior to fishing. Fishers will also be given pot tags at the time of registration. It is important for fishers to understand that they are operating under the authority of the CDQ permit holder. It is the individual CDQ group's decision as to how the CDQ crab quota will be harvested. Commercial fishers are also reminded that their subsistence pots must be removed from the water 14 days prior to the opening of the commercial king crab season. Commercial pots must be removed from the water by noon, June 28, 2007 or secured open with all bait and bait containers removed, prior to the opening of the open access portion at noon, July 1.

Emergency Order: 3-C-Z-02-07 Effective Date: August 7, 2007

EXPLANATION: This emergency order closes the commercial open access crab fishery in Norton Sound at 12:00 noon Tuesday, August 7, 2007. Crab pots must be out of the water by 12:00 noon Friday, August 10, 2007.

JUSTIFICATION: The guideline harvest level for the 2007 Norton Sound open access crab fishery is 291,375 pounds. Through August 2 there were 244,451 pounds harvested. The quota is expected to be reached by 12:00 noon Tuesday, August 7. Commercial pots must be removed from the water by noon, August 7, 2007 or secured open with all bait and bait containers removed. All pots must be removed from the water by noon, August 10, 2007.

HERRING

Emergency Order: 3-H-Z-1-07 Effective Date: June 7, 2007

EXPLANATION: This emergency order opens the Norton Sound District to commercial gillnet herring fishing beginning 12 p.m. Thursday, June 7 until July 1, 2007, unless superseded by another emergency order.

JUSTIFICATION: Herring were first caught in the department test net on June 1, and the biomass has continued to build. The quota this year for the Norton Sound District is over 7,000 tons of herring. No buyers are interested in herring for sac roe. One buyer is interested in buying less than 50 tons of herring for use as bait. To allow maximum flexibility for the buyer the department will open the fishery for the remainder of month unless superseded by another emergency order. The limited commercial harvest will not jeopardize the herring resource.

-continued-

Emergency Order: 3-H-Z-2-07 Effective Date: June 12, 2007

EXPLANATION: This emergency order opens Subdistrict 1 from Canal Point to Wood Point to wild kelp harvest.

JUSTIFICATION: A Norton Sound herring permit holder has notified the department that he has a market for 2,000 to 4,000 pounds of spawn-on-kelp. The permit holder has not participated in the set gillnet sac roe herring fishery and wishes to harvest kelp. Permit holders can only harvest kelp if they have not participated in the sac roe or herring pound fishery. Spawning has occurred for less than one week and the kelp should be of marketable quality. Leaving the wild kelp fishery open for one week provides reasonable opportunity for harvesting kelp even if the permit holder experiences delays attributed to inclement weather and/or mechanical problems. Up to 30 metric tons may be taken in the wild kelp fishery and a harvest of 4,000 pounds should not affect subsistence harvests or future herring returns.

KOTZEBUE SALMON

Emergency Order: 3-S-X-01-07 Effective Date: July 10, 2007

EXPLANATION: This emergency order opens commercial fishing in the Kotzebue District until September 1, 2007. Commercial permit holders may fish at any time a market is available for their catch.

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. The season normally opens on July 10 and by regulation closes after August 31. The buyer has notified the department that they would like to begin purchasing fish as soon as the plant is ready for operations. The earliest the buyer expects the plant to be ready is on July 12. The forecast was for a harvest of 100,000 to 150,000 chum salmon this year. The historical harvest has been over 100,000 chum salmon most years. To provide maximum opportunity to those who will fish, the department is opening the commercial salmon season 24 hours a day until further notice and the season will close on September 1, 2007. Permit holders can choose when they want to fish according to market conditions. Having the fishery open 24 hours per day will allow the buyer to determine the fishing schedule that will provide for maximum quality of salmon based on processing time and airline schedules. With a limited market and an expected low number of participating permit holders, similar to recent years, achieving escapement goals are not expected to be a problem. If escapement becomes a concern then a restricted fishing schedule will go into effect. Permit holders will have to make use of any salmon the buyer does not purchase. If any dumping of salmon occurs the department will close the fishery and meet with buyers and permit holders and design a schedule that is more efficient and to remind permit holders that the buyer is not required to buy any salmon not meeting quality standards.

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NORTON SOUND SALMON

Emergency Order: 3-S-Z-01-07 Effective Date: June 15, 2007

EXPLANATION: This emergency order sets the subsistence salmon fishing schedule for the Nome Subdistrict and catch limits for the Nome Subdistrict, and Pilgrim and Kuzitrin Rivers in the Port Clarence District.

JUSTIFICATION: Since 1991, with the exception of 2006, Subdistrict 1, the Nome Subdistrict, has closed to salmon fishing beginning on June 15th and opened periodically during the season based on salmon run strength. In 1999 Subdistrict 1 became a Tier II chum salmon fishery because of declining chum runs. If the forecast is below the amount necessary for subsistence (ANS) a Tier II situation exists and Subdistrict 1 is closed to the taking chum salmon except for Tier II permit holders. This year the department forecast is that the chum salmon run will exceed the ANS and Tier II restrictions will not be required. Catch limits are still in effect for the various marine and fresh water subsistence areas. Most catch limits have been doubled because of the expected good run of salmon. The last three years most salmon limits were waived in mid-season because of strong runs. In addition the Pilgrim River and Kuzitrin River also have catch limits. 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 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. By regulation the subsistence gillnet fishing schedule for the Nome Subdistrict begins on June 15th.

Emergency Order: 3-S-Z-02-07 Effective Date: June 16, 2007

EXPLANATION: This emergency order closes all marine waters in Subdistrict 6, the Unalakleet Subdistrict, and all waters of the Unalakleet River drainage and all marine waters in Subdistrict 5, the Shaktoolik Subdistrict to subsistence salmon fishing beginning June 16 and reopens the above waters beginning June 18 to a subsistence fishing 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: The Subdistrict 5 and 6 king salmon management plan requires subsistence fishing to be limited from mid-June to mid-July to protect king salmon. King salmon were declared a stock of concern in 2004 in Subdistricts 5 and 6 and failed to meet the minimum escapement goal for the last three years. The Alaska Board of Fisheries has established new regulations limiting subsistence fishing time to allow more opportunity for king salmon to pass upstream to the spawning. All salmon nets must be removed from all fresh waters and marine waters of Subdistrict 6, the Unalakleet Subdistrict, and the marine waters of Subdistrict 5, the Shaktoolik Subdistrict, and no gillnet with a mesh 4 inches or greater may be used in the above mentioned waters closed to salmon gillnets, except during the fishing schedule listed above.

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Emergency Order: 3-S-Z-03-07 Effective Date: July 4, 2007

EXPLANATION: Effective 6:00 p.m. Wednesday July 4, the marine waters of Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, and all waters of the Unalakleet River drainage will be closed to subsistence salmon fishing for salmon with gillnets with a mesh size of 4 inches or larger. The weekly salmon gillnet fishing schedule in both the marine waters of Subdistricts 5 and 6, and the freshwaters of the Unalakleet River drainage is suspended until further notice. Beach seining is allowed during the weekly subsistence fishing schedule in the Unalakleet River for other salmon, but any king salmon that are caught must be immediately returned to the water. The weekly schedule in the Unalakleet River is from 8 a.m. Monday until 8 p.m. Tuesday and 8 a.m. Friday until 8 p.m. Saturday.

JUSTIFICATION: King salmon were declared a stock of concern in 2004 in Subdistricts 5 and 6 and failed to meet the minimum escapement goal for the last three years. As of July 3, the cumulative king salmon count at North River tower is 144, which is well below the king count of 259 by this date in 2006. The 2006 king salmon count at North River was the worst on record. The Unalakleet River test net catch of 80 king salmon is above the historical average, but daily king catches have declined since peaking on June 26. Additionally, from June 25 to June 30 subsistence king salmon catches in the marine waters of Subdistrict 6 dropped by 50% from the previous week's catch. An identical amount of fishing effort occurred during both weeks. Considering the substantial decrease in test net and subsistence king catches as well as the present low abundance of king salmon in the North River, a subsistence gillnet fishing closure is necessary to conserve king salmon. All salmon nets must be removed from all marine waters of Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, and the freshwaters of the Unalakleet River drainage. No gillnet with a mesh 4 inches or greater may be used in the above mentioned waters closed to salmon gillnets. The marine waters of the Shaktoolik Subdistrict are being closed as tagging studies have shown an intermingling of Shaktoolik and Unalakleet Subdistrict fish in each Subdistrict. Beach seining is allowed in the Unalakleet River to harvest salmon other than king salmon. Any king salmon caught in beach seines must be returned to the water immediately.

Emergency Order: 3-S-Z-04-07 Effective Date: July 8, 2007

EXPLANATION: This emergency order opens the Grantley Harbor Subdistrict of the Port Clarence District to commercial salmon fishing for 12 hours from 12:01 a.m. until 12:01 p.m. Sunday, July 8.

JUSTIFICATION: Based on the most recent 4-year average, the quarter point date of the sockeye salmon run is July 9. As of July 6, the sockeye salmon cumulative passage by the Pilgrim River weir is 7,000 sockeye. Since July 3, the daily passage is averaging 2,000 sockeye a day. The Port Clarence commercial sockeye salmon guideline harvest range is 0-10,000 sockeye salmon. Since 2004, the combined subsistence harvest from Port Clarence and Pilgrim River has averaged about 10,000 sockeye.

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Emergency Order: 3-S-Z-05-07 Effective Date: July 10, 2007

EXPLANATION: This emergency order re-opens the Grantley Harbor Subdistrict to commercial salmon fishing for one 12-hour commercial fishing period per day from Tuesday July 10 to Thursday July 12. Periods will last from 12:01 a.m. until 12:01 p.m.

JUSTIFICATION: The department can allow commercial salmon fishing in the Grantley Harbor Subdistrict with a guideline harvest range of 10,000 sockeye salmon if the in-river run goal of 30,000 sockeye is projected to be reached. Based on the most recent 4-year average, the quarter point date of the sockeye salmon run is July 9. At this time, the sockeye salmon cumulative passage by the Pilgrim River weir is 9,000 sockeye. Since July 3, the daily passage is averaging 2,000 sockeye a day. The Port Clarence commercial sockeye salmon guideline harvest range is 0-10,000 sockeye salmon. Since 2004, the combined subsistence harvest from Port Clarence and Pilgrim River has averaged about 10,000 sockeye.

Emergency Order: 3-S-Z-06-07 Effective Date: July 10, 2007

EXPLANATION: This emergency order opens the Moses Point Subdistrict of the Norton Sound District to commercial salmon fishing for 24 hours from 6:00 p.m. Tuesday July 10 until 6:00 p.m. Wednesday, July 11.

JUSTIFICATION: As of July 8, the cumulative chum salmon passage by the Kwiniuk River tower is 15,639 chum, which is well above the lower end of the escapement goal range of 11,500 fish. Current chum salmon escapement levels indicate there is a surplus of chum salmon available for harvest. In order to conserve king salmon in Norton Sound, fishers will be restricted to gillnets with a mesh size no larger than 6 inches. The buyer has asked the department to schedule the fishing period to begin on Tuesday instead of Monday so that their tender is in the area in time to transport the commercial catch.

Emergency Order: 3-S-Z-07-07 Effective Date: July 12, 2007

EXPLANATION: This emergency order waives the chum salmon catch limits for subsistence fishing in the marine waters east of Cape Nome and in the subsistence fishing zones of the Eldorado and Flambeau Rivers.

JUSTIFICATION: The escapement goal range at the Eldorado weir is 6,000 to 9,200 chum salmon. On July 10, the low end of the escapement goal range was exceeded and cumulative escapement is 6,313 chum salmon. Historically the midpoint of the chum salmon run at the weir is July 12 so the high end of the escapement will likely be easily exceeded. The Eldorado-Flambeau river system is the major chum salmon river system in the eastern Nome Subdistrict. The Eldorado River is a tributary of the Flambeau River and waiving the chum salmon limits in the marine waters east of Cape Nome and in the Eldorado and Flambeau Rivers will not jeopardize escapement. The subsistence fishing zone in both the Eldorado and Flambeau Rivers is below the major spawning areas so the majority of the chum salmon escapement is protected.

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Emergency Order: 3-S-Z-08-07 Effective Date: July 13, 2007

EXPLANATION: This emergency order re-opens the Moses Point Subdistrict of the Norton Sound District to commercial salmon fishing for 24 hours from 6:00 p.m. Friday July 13 until 6:00 p.m. Saturday, July 14.

JUSTIFICATION: As of July 11, the cumulative chum salmon passage by the Kwiniuk River tower is 19,500 chum, which is well above the lower end of the escapement goal range of 11,500 fish. The 2007 Kwiniuk River tower count is above the most recent five, ten, and twenty-year historical averages by this date. Current chum salmon escapement levels indicate there is a surplus of chum salmon available for harvest. This brief commercial fishing period and the anticipated limited fishing effort should not jeopardize chum salmon subsistence fishing or escapement needs. In order to conserve king salmon in Norton Sound, fishers will be restricted to gillnets with a mesh size no larger than 6 inches. The buyer has asked the department to schedule the fishing period to begin on Friday instead of Thursday so that the tender can return to the area in time to transport the commercial catch.

Emergency Order: 3-S-Z-09-07 Effective Date: July 13, 2007

EXPLANATION: This emergency order waives the chum and sockeye salmon catch limits for subsistence fishing in the marine waters of Nome Subdistrict and the freshwater subsistence areas of the Nome Subdistrict (except for the Cripple, Penny and Solomon Rivers), and waives the sockeye salmon limit in the Pilgrim River.

JUSTIFICATION: The Nome Subdistrict escapement goal range is 23,000 – 35,000 chum salmon and should easily be met this year. The escapement goal range at Eldorado River weir is 6,000 to 9,200 chum salmon. The cumulative escapement through July 12 is 8,287 chum salmon. The escapement goal range at the Nome River weir is 2,900 to 4,300 chum salmon. The cumulative escapement through July 12 is 1,166 chum salmon with an additional 1,500 chum salmon estimated downstream of the weir. The escapement goal range at the Snake River weir is 1,600 to 2,500 chum salmon. The cumulative escapement through July 12 is 1,128 chum salmon. Historically, the midpoint of the chum salmon run through the Eldorado weir is July 12, and at the Nome and Snake Rivers the midpoints at the weirs are next week. The Solomon River has weaker chum salmon run than most other Nome Subdistrict rivers and has much easier access by road so the catch limit will remain in effect for the Solomon River. The Cripple and Penny Rivers remain closed by regulation to the taking of chum salmon. Waiving the chum salmon limits in the marine waters east of Cape Nome and in the fresh water subsistence areas should not jeopardize escapement. The subsistence fishing areas in the rivers are below the major spawning areas so the majority of the chum salmon escapement is protected.

The Glacial Lake weir has been operational for a week and has had an average passage rate of 500 sockeye salmon a day. The escapement goal range at Glacial Lake is an aerial survey goal of 800 to 1,600 sockeye salmon observed. With over 3,500 sockeye salmon through the weir the aerial survey goal should easily be observed. Glacial Lake is part of the Sinuk River drainage

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and no subsistence fishing is allowed upstream of the Fish & Game marker approximately 2 miles upstream of the Sinuk River mouth, except for hook and line fishing and bag limits are then 3 sockeye salmon per day when outside the subsistence area. As the subsistence fishing area in the Sinuk River is well downstream of the lake the majority of the sockeye escapement is protected for spawning needs.

The Pilgrim River weir the last several days has had an average daily passage rate of over 2,000 sockeye salmon. The cumulative escapement through July 12 is 17,511 sockeye salmon. The average historical midpoint at the weir has been July 15 and if the sockeye salmon run is exhibiting average timing then projections show the weir passage will be over 40,000 sockeye salmon. The escapement goal range at Salmon Lake is an aerial survey goal of 4,000 to 8,000 sockeye salmon observed. An additional in-river projected goal of 30,000 sockeye salmon for the Pilgrim River is necessary for commercial fishing to occur. The majority of sockeye salmon spawn in Salmon Lake and in the Pilgrim River near the outlet of Salmon Lake. Both the lake and first 300 feet of Pilgrim River are closed to salmon fishing to protect spawning salmon.

Emergency Order: 3-S-Z-10-07 Effective Date: July 14, 2007

EXPLANATION: This emergency order re-opens the Grantley Harbor Subdistrict to commercial salmon fishing for one week beginning at 12:01 a.m. Saturday July 14 to 11:59 p.m. Friday July 20.

JUSTIFICATION: Commercial fishing began in Grantley Harbor Subdistrict on July 8. The commercial harvest has been minimal with only a few permit holders participating in the fishery. Opening the commercial fishery for a week will allow the buyer to coordinate fishing times to maximize efficiency and provide for optimal quality. Following this period, the department will re-evaluate the Pilgrim River sockeye salmon escapement to determine whether additional commercial fishing will be permitted. Based on the most recent 4-year average, the midpoint date of the sockeye salmon run is July 15. As of July 12, the sockeye salmon cumulative passage by the Pilgrim River weir is 17,511 sockeye and the daily passage has averaged 2,000 sockeye since July 3. If the sockeye salmon run continues to exhibit average run-timing, then the Pilgrim River weir passage is projected to exceed 40,000. The Port Clarence commercial sockeye salmon guideline harvest level (GHL) is 10,000 if the department projects an in-river goal of 30,000. The GHL can only be exceeded if the in-river goal is met.

Emergency Order: 3-S-Z-11-07 Effective Date: July 14, 2007

EXPLANATION: This emergency order extends the beach seining period in all fresh waters of the Subdistrict 6, the Unalakleet Subdistrict, to beach seining for all salmon beginning 8:00 p.m. Saturday July 14, except for the Unalakleet River drainage where all king salmon captured above the confluence of the North River must be returned to the water immediately.

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JUSTIFICATION: The department test net on the Unalakleet River has caught 92 king salmon, 445 chum, and 232 pink so far this season. Since the closure last week, king salmon passage at the North River tower has improved and is nearing 1,200, the lower end of the escapement goal. With over two thirds of the cumulative passage at the North River tower occurring in the last week, the closure has had the desired effect of increasing of king salmon in the Unalakleet River drainage and the low end of the escapement goal range will be easily surpassed in the next few days.

To allow additional subsistence opportunity of other salmon species, the subsistence salmon beach seining period will be extended to allow for beach seining seven days a week until July 31. The restriction on keeping king salmon above the confluence of the North River will remain in effect in order to protect the larger female king salmon already present in the Unalakleet River drainage. Any king salmon caught in the Unalakleet River drainage above the confluence of the North River using beach seines must be returned to the water immediately. All salmon species, including king salmon caught in beach seines below the confluence can be retained for subsistence purposes.

Emergency Order: 3-S-Z-12-07 Effective Date: July 16, 2007

EXPLANATION: This emergency order opens all fresh waters of Subdistrict 5, the Shaktoolik Subdistrict, to beach seining for salmon seven days a week beginning 12:01 a.m. Monday July 16.

JUSTIFICATION: The department test net on the Unalakleet River has caught 92 king salmon, 445 chum, and 232 pink so far this season. Since the closure last week, king salmon passage at the North River tower has improved and is nearing 1,200, the lower end of the escapement goal. With over two thirds of the cumulative passage at the North River tower occurring in the last week, the closure has had the desired effect of increasing of king salmon in the Unalakleet River drainage and the lower end of the escapement goal range will be easily surpassed in the next few days. Unalakleet Subdistrict king salmon catch and escapement indices are used to manage king salmon in Subdistrict 5 as previous tagging studies have shown an intermingling of fish stocks in both subdistricts. The department thinks the king salmon gillnet fishing schedule and subsequent closure last week have had the desired effect of putting sufficient numbers of king salmon on the spawning grounds in the Shaktoolik River. In addition, nearly all the king salmon subsistence harvest in Subdistrict 5 occurs in the marine waters and the vast majority of local residents have expressed that they have already met their king salmon subsistence needs. Allowing beach seining for salmon will provide local residents the opportunity to harvest other salmon species for subsistence, primarily pink and coho salmon, without jeopardizing king salmon escapement needs.

Emergency Order: 3-S-Z-13-07 Effective Date: July 16, 2007

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EXPLANATION: This emergency order reopens the fresh waters of the Unalakleet River downstream of the confluence of the North River and all other fresh waters and marine waters in Subdistrict 6, the Unalakleet Subdistrict, and all fresh waters and marine waters in Subdistrict 5, the Shaktoolik Subdistrict to salmon gillnet fishing with mesh size restricted to 6 inches or less seven days a week beginning 12:01 a.m. Monday July 16.

JUSTIFICATION: The department test net on the Unalakleet River has caught 92 king salmon, 445 chum, and 232 pink so far this season. Since the closure last week, king salmon passage at the North River tower has improved and is nearing 1,200, the lower end of the escapement goal. With over two thirds of the cumulative passage at the North River tower occurring in the last week, the closure has had the desired effect of increasing of king salmon in the Unalakleet River drainage and the escapement goal will be easily surpassed in the next few days.

To allow subsistence opportunity of other salmon species, the marine waters of Subdistrict 5 and 6 and all fresh waters of Subdistricts 5 and 6, except for the Unalakleet River above the confluence of the North River, will reopen to subsistence salmon fishing with set gillnets. Gillnet mesh size must be 6 inches or less and total gillnet length cannot exceed 150 feet in length and may obstruct not more than one-half the width of any waterway. The restrictions on the Unalakleet River upstream of the North River and 6-inch mesh size restrictions will remain in effect in order to protect the larger female king salmon migrating into the Unalakleet River drainage.

Emergency Order: 3-S-Z-14-07 Effective Date: July 17, 2007

EXPLANATION: This emergency allows for two additional days of subsistence fishing in the marine waters of Subdistrict 1, the Nome Subdistrict.

JUSTIFICATION: The Nome Subdistrict escapement goal range is 23,000 – 35,000 chum salmon and should easily be met this year. The escapement goal range at Eldorado River weir is 6,000 to 9,200 chum salmon. The cumulative escapement through July 16 is 12,383 chum salmon. The escapement goal range at the Nome River weir is 2,900 to 4,300 chum salmon. The cumulative escapement through July 16 is 1,779 chum salmon at the historical midpoint of the run through the weir. The escapement goal range at the Snake River weir is 1,600 to 2,500 chum salmon. The cumulative escapement through July 16 is 1,662 chum salmon. An additional 4 rivers make up the Nome Subdistrict escapement goal range and the escapement will easily be reached this year. Allowing an additional two days of subsistence fishing in the marine waters should not jeopardize escapement. Emergency Order: 3-S-Z-15-07 Effective Date: July 17, 2007

Emergency Order: 3-S-Z-15-07 Effective Date: July 17, 2007

EXPLANATION: This emergency order re-opens Subdistrict 3, the Moses Point Subdistrict, of the Norton Sound District to commercial salmon fishing for 30 hours from 6:00 p.m. Tuesday, July 17 until 11:59 p.m. Wednesday, July 18.

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JUSTIFICATION: As of July 16, the cumulative chum salmon passage by the Kwiniuk River tower is 22,515 chum salmon, which is well above the lower end of the escapement goal range of 11,500 chum and near the higher end of 23,000 chum. The 2007 Kwiniuk River tower count is above the most recent five, ten, and twenty-year historical averages by this date. Current chum salmon escapement levels indicate there is a surplus of chum salmon available for harvest. This brief commercial fishing period and the anticipated limited fishing effort should not jeopardize chum salmon subsistence fishing or escapement needs. In order to conserve king salmon in Norton Sound, fishers will be restricted to gillnets with a mesh size no larger than 6 inches. The buyer has asked the department to schedule the fishing period to begin on Tuesday and to go until midnight the following evening to allow for optimal scheduling for the tender. As the escapement goal range has been met this opening should not jeopardize escapement or subsistence fishing.

Emergency Order: 3-S-Z-16-07 Effective Date: July 18, 2007

EXPLANATION: This emergency order opens Subdistrict 5, the Shaktoolik Subdistrict, and Subdistrict 6, the Unalakleet Subdistrict to commercial salmon fishing for one 24-hour period beginning on 6 p.m. Wednesday, July 18 until 6 p.m. Thursday, July 19. Permit holders will be restricted to gill nets with a mesh size of 6 inches or less.

JUSTIFICATION: Chum salmon escapements throughout Norton Sound have been good and there are early indications that the coho salmon run will also be strong. As of July 17, the Unalakleet River test net has caught 565 chum and 3 coho, and the North River counting tower chum and coho passage estimates are 2,298 and 528 respectively. The 2007 chum and coho salmon test net catches are above the historical 5, 10, and 20-year historical averages. North River tower chum salmon passage is below average, but the North River is not a big chum salmon producer. However, the North River tower coho salmon passage is a record for this date and is tracking well ahead of the record escapement that occurred in 2005. Chum salmon escapement needs have already been met, and this brief 24-hour commercial fishing period will provide the department with another index of coho run strength and should not jeopardize coho salmon escapement and subsistence fishing needs. In addition, the incidental harvest of king salmon should be miniscule due to the brevity of the period and the 6-inch or less mesh size restriction.

Emergency Order: 3-S-Z-17-07 Effective Date: July 20, 2007

EXPLANATION: This emergency order re-opens Subdistrict 3, the Moses Point Subdistrict, of the Norton Sound District to commercial salmon fishing for 30 hours from 6:00 p.m. Friday, July 20 until 11:59 p.m. Saturday, July 21.

JUSTIFICATION: During the most recent 30-hour period, the commercial catches were 1,625 chum and 269 pink and 3 coho for 7 permit holders. The chum salmon catch was above average. As of July 19, cumulative counts at the Kwiniuk River tower are 216 Chinook, 24,393 chum, 23,079 pink and 72 coho. It is unlikely that the lower end of the Kwiniuk River Chinook salmon escapement goal (300) will be reached. However, both the upper end of the chum salmon escapement goal range of 23,000 and the pink salmon escapement goal of 8,400 have been easily surpassed. There are early indications from catch and escapement data in

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Unalakleet and Shaktoolik that that coho salmon runs will be strong throughout Norton Sound this season. Furthermore, the department anticipates that coho returns in the Moses Pt. Subdistrict will begin to exhibit this strong and early run-timing that has been observed in southern Norton Sound. This 30-hour commercial fishing period will allow additional harvest of chum salmon and will give the department an early index of coho salmon run strength in the Moses Pt. Subdistrict. In order to conserve any remaining king salmon in northern Norton Sound, fishers will be restricted to gillnets with a mesh size no larger than 6 inches. Chum and pink salmon escapements have already been met and the mesh size restrictions and limited fishing effort should minimize the incidental king salmon catch and should not jeopardize coho salmon subsistence fishing or escapement needs. Following this period, the department will re-evaluate the latest catch and escapement data from the Moses Pt. Subdistrict to determine if further commercial fishing is warranted.

Emergency Order: 3-S-Z-18-07 Effective Date: July 21, 2007

EXPLANATION: This emergency order opens the Grantley Harbor Subdistrict to commercial salmon fishing until July 31.

JUSTIFICATION: Commercial fishing began in Grantley Harbor Subdistrict on July 8 and there have been eight 12-hour fishing periods to date. Thus far, only 2 permit holders have participated in the fishery and it is unlikely that the Guideline Harvest Level (GHL) of 10,000 sockeye will be reached. As of July 19, the cumulative sockeye salmon passage by the weir is 31,362. If the 2007 sockeye run is exhibiting average run-timing, then projections show that the Pilgrim River weir passage will be over 40,000 sockeye salmon. With an estimated 2,000 sockeye salmon harvested from the Pilgrim River subsistence fishery, the in-river run goal of 30,000 has been reached. Opening the commercial fishery for the remainder of July allows the buyer to coordinate fishing times to maximize efficiency and provide for better quality. Furthermore, the limited commercial fishing effort should not jeopardize sockeye salmon subsistence fishing needs in Port Clarence or the Pilgrim River.

Emergency Order: 3-S-Z-19-07 Effective Date: July 20, 2007

EXPLANATION: This emergency order re-opens Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts to commercial salmon fishing for one 24-hour period from 6 p.m. Friday,

July 20 until 6 p.m. Saturday, July 21. Permit holders will be restricted to gill nets with a mesh size of 6 inches or less.

JUSTIFICATION: Thus far, the 2007 coho run is demonstrating early run strength in southern Norton Sound. Commercial catches from the July 18 opener were 799 chum salmon and 458 silver salmon for 8 permit holders in the Shaktoolik Subdistrict and 3 king salmon, 964 chum salmon, 697 pink salmon and 1,650 silver salmon for 11 permit holders in the Unalakleet Subdistrict. Coho catches in both subdistricts were records for this early in the season. As of July 19, the Unalakleet River test net has caught 626 chum and 26 coho, and the North River counting tower chum and coho salmon cumulative passage estimates are 2,634 and 774,

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respectively. The chum test net catch is above average and the coho catch trails only the 2005 and 2006 test net catch by this date. However, the North River tower coho salmon passage is a record for this date and is tracking well ahead of the strong coho escapements that occurred from 2004-2006. Chum salmon escapement needs have already been met, and this brief 24-hour commercial fishing period will provide the department with another index of coho run strength and should not jeopardize coho salmon escapement and subsistence fishing needs. In addition, the incidental harvest of king salmon should be miniscule due to the brevity of the period and the 6-inch or less mesh size restriction. Following this period, the department will re-evaluate coho escapements and commercial catches in order to determine if further commercial fishing will be permitted.

Emergency Order: 3-S-Z-20-07 Effective Date: July 22, 2007

EXPLANATION: This emergency order opens Subdistrict 5, the Shaktoolik Subdistrict, and Subdistrict 6, the Unalakleet Subdistrict to commercial salmon fishing for coho salmon season for two 48-hour periods a week, from 6 p.m. Sunday until 6 p.m. Tuesday and from 6 p.m. Wednesday until 6 p.m. Friday, until the season closes by regulation after September 7.

JUSTIFICATION: Chum salmon escapements throughout Norton Sound have been good and there are early indications that the coho salmon run will also be strong. As of July 21, the Unalakleet River test net has caught 40 coho salmon, and catch ranks third out of 23 years. The North River counting tower has a passage estimate of 936 coho salmon and that is a record in the 12 year counting history of the project.

The coho salmon run is showing to be very strong for this early date. During coho salmon season the normal commercial fishing schedule for Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, is two 48-hour openings a week. The department has consulted with the buyer as to what would be the most effective schedule for their operations. At the buyers request the Shaktoolik and Unalakleet Subdistricts will be open to commercial fishing from 6 p.m. Sunday until 6 p.m. Tuesday and from 6 p.m. Wednesday until 6 p.m. Friday until further notice.

If the 2007 coho salmon run is an early run and begins to falter later in the season as indicated by commercial catches, subsistence catches, test net catches and tower counts the department will have restrictions on commercial fishing. Beginning the normal commercial fishing schedule should not jeopardize the subsistence fishery or escapement and action will be taken if necessary in the future to protect subsistence fishers and escapement.

Emergency Order: 3-S-Z-21-07 Effective Date: July 23, 2007

EXPLANATION: This emergency order sets the subsistence salmon fishing schedule and catch limits for the Nome Subdistrict until mid-August.

JUSTIFICATION: The subsistence salmon fishing schedule is set in regulation. For coho salmon season the subsistence fishing schedule begins on July 26. As the chum salmon escapement has

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been met in the Nome Subdistrict the more liberal coho salmon fishing schedule of fishing five days a week in the marine waters, compared to three days a week during chum salmon season, will begin effective July 23. This change should not jeopardize escapement. Catch limits are in effect for coho salmon as listed on the Nome Subdistrict permit.

Emergency Order: 3-S-Z-22-07 Effective Date: July 24, 2007

EXPLANATION: This emergency order re-opens Subdistrict 3, the Moses Point Subdistrict, of the Norton Sound District to commercial salmon fishing for one 24-hour period from 8:00 p.m. Tuesday, July 24 until 8:00 p.m. Wednesday, July 25. Gillnets are restricted to 6 inches or less stretch measure.

JUSTIFICATION: Commercial catches from the recent 24-hour commercial period ending on July 21 were 507 chum salmon, 602 pink salmon and 110 silver salmon for 7 permit holders. Chum catches were above average and silver catches were a record for this early in the season. The Kwiniuk River counting tower reports 26,000 chum salmon, 32,000 pink salmon and 174 silver salmon counted through July 23. The 2007 chum salmon count has surpassed the upper end of the escapement goal range of 23,000. Coho salmon passage by the Kwiniuk River tower is 174 coho and is below the most recent 5-year average as of this date. However, the quarter point of the coho run is August 10 and the department projects the coho passage to increase in the coming days. Commercial catches from this period and Kwiniuk River coho salmon counts will be re-assessed following this period to determine if further commercial fishing will be allowed.

Emergency Order: 3-S-Z-23-07 Effective Date: July 26, 2007

EXPLANATION: This emergency order allows beach seines to be used for two 48-hour periods in Nome Subdistrict waters.

JUSTIFICATION: In the Nome Subdistrict the last week of July is historically the peak of the pink salmon run into subdistrict waters during an odd-numbered year. Pink salmon counts have been increasing at the counting weirs in the Nome Subdistrict and should peak near the end of July. The escapement goal of 3,150 pink salmon at the Nome River weir has been surpassed as 8,808 pink salmon have been counted through July 25. No coho salmon have been counted yet and the usual midpoint of that run at the weir is August 25. The use of beach seines to harvest salmon allows for more efficient harvest of salmon during this period of abundance. This change should not jeopardize escapement. Catch limits are in effect for coho salmon and pink salmon as listed on the Nome Subdistrict permit.

Emergency Order: 3-S-Z-24-07 Effective Date: July 28, 2007

EXPLANATION: This emergency order re-opens Subdistrict 3, the Moses Point Subdistrict, of the Norton Sound District to commercial salmon fishing for one 24-hour period from 6:00 p.m. Saturday, July 28 until 6:00 p.m. Sunday, July 29. Gillnets are restricted to 6 inches or less stretch measure.

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JUSTIFICATION: The catch from the recent 24-hour commercial period ending on July 25 was 289 chum salmon, 206 pink salmon and 172 silver salmon for 6 permit holders. Chum catches were above average and silver catches were a record for this early in the season. A commercial schedule has not been set for the Moses Point Subdistrict because the buyer needs to determine tender availability and plant capacity after each fishing period.

As of July 27, the Kwiniuk River counting tower reports 27,000 chum salmon, 48,000 pink salmon and 730 silver salmon counted through July 27. Cumulative chum salmon passage is well above the upper end of the escapement goal range of 23,000. Additionally, the 2007 coho passage is above the most recent 5-year historical average for this date and is second only to the record run of 2006. Coho salmon escapements have begun to build as previously projected with an average of 150 coho per day migrating by the Kwiniuk River tower. August 10 represents the quarter point of the coho run. Early strong run-timing and above average commercial catches suggests that there is a surplus of coho salmon available for commercial harvest. Furthermore, this brief commercial fishing period will provide another index of coho salmon abundance and should not jeopardize coho salmon subsistence fishing and escapement needs.

Emergency Order: 3-S-Z-25-07 Effective Date: August 2, 2007

EXPLANATION: This emergency order suspends commercial salmon fishing in the marine waters of Subdistrict 5, the Shaktoolik Subdistrict, and Subdistrict 6, the Unalakleet Subdistrict effective 6 p.m. Thursday. Effective 6:00 p.m. Friday August 3, the regular 48-hour commercial fishing schedule will resume with the next period beginning at 6 p.m. Sunday August 5.

JUSTIFICATION: The 2007 coho salmon run is exhibiting very strong early run-timing and the Subdistrict 5 and 6 commercial catches are records for this early in the fishing season. Cumulative passage estimates at the North River counting tower thus far are 1,932 Chinook, 5,904 chum, 524,686 pink, and 5,916 silver salmon. The North River tower coho passage estimate in addition to the Unalakleet

River test net catch of 290 silvers are both records for this date. As of the most recent commercial period ending on July 31, the cumulative coho salmon catches from the Unalakleet and Shaktoolik Subdistricts are 37,293 and 13,405 respectively. Unalakleet and Shaktoolik catches are both records and are more than twice the cumulative catch reported by this date last year.

During coho salmon season the normal commercial fishing schedule for Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, is two 48-hour openings a week. Due to the recent surge in coho salmon catches and limited processor capacity, the buyer has requested that the 48-hour period originally scheduled from 6 p.m. Wednesday August 1 to 6 p.m. Friday August 3 be suspended effective at 6 p.m. Thursday August 2. This request was made so that the buyer can catch up with the workload and avoid sacrificing fish quality. Commercial salmon fishing will resume according to the 48-hour fishing schedule from 6 p.m. Sunday until 6 p.m. Tuesday and from 6 p.m. Wednesday until 6 p.m. Friday unless the buyer requests further reductions in fishing time to prevent exceeding processor capacity.

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Emergency Order: 3-S-Z-26-07 Effective Date: August 3, 2007

EXPLANATION: This emergency order suspends the regular 48-hour commercial fishing schedule for Subdistrict 5, the Shaktoolik Subdistrict and Subdistrict 6, the Unalakleet Subdistrict and reopens commercial fishing for two 24-hour periods from 6 p.m. Sunday August 5 to 6 p.m. Monday August 6, and from 6 p.m. Tuesday August 7 to 6 p.m. Wednesday August 8. The regular 48-hour commercial fishing schedule will resume effective 6 p.m. Friday August 10.

JUSTIFICATION: The 2007 coho salmon run is exhibiting very strong early run-timing and the Subdistrict 5 and 6 commercial catches are records for this early in the fishing season. The North River tower cumulative coho passage estimate is 6,492 coho and the department test net at the Unalakleet River has caught 342 coho. Coho tower counts and test net catches are records for this date and more than 3 times the historical 5 and 10-year averages. Additionally, as of the most recent commercial period ending on August 2, cumulative coho salmon catches are records for early August with 44,800 silver salmon in the Unalakleet Subdistrict and 16,700 coho in the Shaktoolik Subdistrict. Catches for the most recent 24-hour period were 135 chum, 3,302 coho for 10 permit holders in Shaktoolik and 7,508 silver salmon for 29 permit holders in Unalakleet.

During coho salmon season the normal commercial fishing schedule for Subdistricts 5 and 6, the Shaktoolik and Unalakleet Subdistricts, is two 48-hour openings a week. However, due to the recent surge in coho salmon catches and limited processor capacity, the buyer has requested that the 48-hour period originally scheduled from 6 p.m. Sunday August 5 to 6 p.m. Tuesday August 7 be suspended. In its place, the department will allow two 24-hour commercial fishing periods from 6 p.m. Sunday August 5 to 6 p.m. Monday August 6 and from 6 p.m. Tuesday August 7 until 6 p.m. Wednesday August 8. This request was made so that the buyer can catch up with the workload and avoid sacrificing fish quality. Effective 6 p.m. Friday August 10, the commercial salmon fishing will resume according to the 48-hour fishing schedule from 6 p.m. Sunday until 6 p.m. Tuesday and from 6 p.m. Wednesday until 6 p.m. Friday. In the mean time, the department will remain in close consultation with the buyer to determine if further reductions in fishing time are necessary to prevent exceeding processor capacity.

Emergency Order: 3-S-Z-27-07 Effective Date: August 4, 2007

EXPLANATION: This emergency order re-opens Subdistrict 3, the Moses Point Subdistrict, of the Norton Sound District to commercial salmon fishing for one 24-hour period from 6:00 p.m. Saturday, August 4 until 6:00 p.m. Sunday August 5. Gillnets are restricted to 6 inches or less stretch measure.

JUSTIFICATION: The catch from the recent 24-hour commercial period ending on July 29 was 238 chum and 464 coho for 6 permit holders. Cumulative commercial catches for the Moses Point Subdistrict this season are 1 king, 3,955 chum, 2,405 pink and 749 silver salmon. Silver catches are records for this date. A commercial schedule has not been set for the Moses Point Subdistrict because the buyer needs to determine tender availability and plant capacity after each fishing period. As of August 2, the Kwiniuk River counting tower reports that 27,717 chum salmon, 50,802 pink salmon and 1,593 silver salmon have passed the tower. Chum and pink salmon escapements have been achieved and the silver salmon count is tracking well above the recent

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5-year average. Cumulative chum salmon passage is well above the upper end of the escapement goal range of 23,000. Since July 27, coho salmon escapements have begun to build as previously projected with an average of 150 coho per day migrating by the Kwiniuk River tower. August 10 represents the quarter point of the coho run. Early strong run-timing and above average commercial catches suggests that there is a surplus of coho salmon available for commercial harvest. Furthermore, this brief commercial fishing period will provide another index of coho salmon abundance and should not jeopardize coho salmon subsistence fishing and escapement needs.

Emergency Order: 3-S-Z-28-07 Effective Date: August 8, 2007

EXPLANATION: This emergency order re-opens Subdistrict 3, the Moses Point Subdistrict, of the Norton Sound District to commercial salmon fishing for one 24-hour period from 6:00 p.m. Wednesday, August 8 until 6:00 p.m. Thursday August 9.

JUSTIFICATION: The catch from the recent 24-hour commercial period ending on August 5 was 1,000 coho salmon and 40 chum salmon for 6 permit holders. Silver catches are records for this date. A commercial schedule has not been set for the Moses Point Subdistrict because the buyer needs to determine tender availability and plant capacity after each fishing period.

As of August 5, the Kwiniuk River counting tower reports that 2,361 coho salmon have passed the tower. The coho salmon escapement is 25% above the 5-year average and is the second best for this date since the tower project began enumerating the coho salmon in 2001. Early strong run-timing and above average commercial catches suggests that there is a surplus of coho salmon available for commercial harvest. Furthermore, this brief commercial fishing period will provide another index of coho salmon abundance and should not jeopardize coho salmon subsistence fishing and escapement needs.

Emergency Order: 3-S-Z-29-07 Effective Date: August 9, 2007

EXPLANATION: This emergency order suspends the regular 48-hour commercial fishing schedule for Subdistrict 5, the Shaktoolik Subdistrict and Subdistrict 6, the Unalakleet Subdistrict and reopens commercial fishing for one 48-hour period from 6 p.m. Thursday August 9 to 6 p.m. Saturday August 11.

JUSTIFICATION: The 2007 coho salmon run has had record commercial catches and record escapements to date. The buyer has requested a shift in the 48-hour fishing period by one day to allow them to return to a 48-hour fishing period after two 24 hour fishing periods gave them time to catch up with processing demands.

To allow for optimum fish quality the buyer has determined what days work best in their schedule for quality and airline schedules. The department has allowed for two 48-hour fishing periods and lets the buyer determine the days and times that work best with that framework.

Emergency Order: 3-S-Z-30-07 Effective Date: August 10, 2007

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EXPLANATION: This emergency order re-opens Subdistrict 3, the Moses Point Subdistrict, of the Norton Sound District to commercial salmon fishing for the remainder of the season from 12:00 p.m. August 10 through August 31. Up to two 24-hour fishing periods per week will be determined by the buyer depending on tender availability, processor capacity and the local weather forecast.

JUSTIFICATION: The catch from the recent 24-hour commercial period ending on August 9 was 1,015 coho salmon and 94 chum salmon for 8 permit holders. Silver catches are records for this date. As of August 9, the Kwiniuk River counting tower reports that 3,045 coho salmon have passed the tower. The coho salmon escapement is slightly above the recent 5-year average and is the second best for this date since the tower project began enumerating the coho salmon in 2001. Early strong run-timing and above average commercial catches suggests that there is a surplus of coho salmon available for commercial harvest. Commercial fishing effort has been minimal in the Moses Point Subdistrict and is expected to remain so. Additionally, silver escapement and subsistence fishing needs should easily be met in the Moses Point Subdistrict. Considering these factors, the department has decided to set a commercial schedule for the remainder of the season. The schedule will consist of no more than two 24-hour periods per week and will be determined at the buyer's discretion. Commercial fishing opportunity has been reduced during the last two weeks due to stormy weather. Having the buyer schedule fishing periods will allow the buyer to better coordinate tender availability and processor capacity with the weather forecast and maximize efficiency and quality. The season closes by regulation on August 31.

These 24-hour commercial fishing periods will provide additional indices of coho salmon run strength and should not jeopardize subsistence fishing opportunity or coho salmon escapement needs. The buyer will notify the department in advance of each opening and the department will continue to evaluate commercial harvests and escapements in the Moses Point Subdistrict to determine if further commercial fishing will be allowed.

Emergency Order: 3-S-Z-31-07 Effective Date: August 16, 2007

EXPLANATION: This emergency order sets the subsistence salmon fishing schedule and catch limits for the Nome Subdistrict until the end of August.

JUSTIFICATION: The subsistence salmon fishing schedule is set in regulation. For coho salmon season the subsistence fishing schedule begins on July 26 and by regulation after August 15 salmon fishing is open seven days a week in the marine waters. The coho salmon escapement is tracking average with normal run timing models for mid-August. Allowing fishing seven days a week in the marine waters should not jeopardize escapement. Catch limits are in effect for coho salmon as listed on the Nome Subdistrict permit.

Emergency Order: 3-S-Z-32-07 Effective Date: August 24, 2007

EXPLANATION: This emergency order opens Subdistrict 3, the Moses Point Subdistrict, of the Norton Sound District to commercial salmon fishing for one 24-hour period from 6:00 p.m. Friday, August 24 until 6:00 p.m. Saturday August 25.

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JUSTIFICATION: The catch from the recent 24-hour commercial period ending on Wednesday, August 22 was 416 coho salmon and 100 chum salmon for 9 permit holders. Silver catches were below average for this date, but the cumulative silver catch of 5,518 silver salmon is the 3rd best on record and is on track to break the 1984 record harvest of 5,969 silver salmon. A commercial schedule was set on August 10 for the Moses Point Subdistrict in which the buyer would set no more than two 24-hour periods per week. On August 10, the department allowed the buyer to set a commercial fishing schedule of no more than two 24-hour periods per week. However, stormy weather greatly reduced commercial fishing opportunity during the first half of the fishing season. In addition, the proportion of blushed or water-marked silver salmon is generally much higher at this point in the season. Considering these factors, the department has agreed to allow an extra 24-hour commercial fishing period for the week ending Saturday, August 25. This period should not jeopardize silver salmon escapement or subsistence fishing needs. Furthermore, another period will allow some harvest before fish quality and harvest decreases to point that makes it unfeasible for the buyer to purchase fish in the Moses Point Subdistrict. Beginning Sunday, August 26, the Moses Point Subdistrict will return to the schedule consisting of no more than 2 24-hour periods per week. The season closes by regulation after August 31.

As of August 22, the cumulative silver salmon passage estimate at the Kwiniuk River tower is 5,970 silver salmon. This is below the most recent 5-year historical average cumulative passage for this date of 6,341 silver salmon. However, this average includes last year's record run of 22,341 silvers, and the 2007 silver escapement is well above the 2001-2005 historical average of 4,434 silvers for this date. Also, this is the first season of commercial salmon harvests since 2001.

Emergency Order: 3-S-Z-33-07 Effective Date: August 28, 2007

EXPLANATION: This emergency order opens Subdistrict 3, the Moses Point Subdistrict, of the Norton Sound District to commercial salmon fishing for one 30-hour period from 12:00 p.m. Tuesday, August 28 until 6:00 p.m. Wednesday August 29.

JUSTIFICATION: Catches from the most recent 24-hour fishing period in the Moses Point Subdistrict ending Saturday night were 67 chum and 152 silvers for 6 permit holders. The silver salmon catch was below average for this date. Cumulative catches for the season through period 13 for the Moses Point Subdistrict are 1 king, 5,670 silvers, 4,518 chum, and 1,648 pink for 10 permit holders. This season's silver catch is the 3rd highest on record. Windows between periods this season have provided for coho salmon escapement and subsistence fishing needs. This 30-hour period will provide additional opportunity for some commercial harvest before the season closes by regulation after August 31. If this period's catches are weak, the buyer has indicated that they do not wish to have any more openings in the Moses Point Subdistrict this season.

The Kwiniuk River tower cumulative silver salmon passage estimate of 7,300 silvers is below the most recent 5-year historical average cumulative passage of 7,545 for this date. However, this average includes last year's record run of 22,341 silvers, and the 2007 silver escapement is well above the 2001-2005 historical average of 5,688 silvers for this date. Additionally, this is the first season of commercial salmon harvests since 2001. The historical midpoint of the Kwiniuk River silver run is August 22 and if the silver run is exhibiting average run-timing, the

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Kwiniuk River tower silver salmon passage is expected to approach 12,000.

Emergency Order: 3-S-Z-34-07 Effective Date: September 1, 2007

EXPLANATION: This emergency order sets the subsistence catch limits for the Nome Subdistrict until the end of October.

JUSTIFICATION: The coho salmon escapement is tracking average with normal run timing models for late-August. By regulation fishing is allowed seven days a week in the subsistence fishing areas. Catch limits are in effect for coho salmon, as listed on the Nome Subdistrict permit, so as not to jeopardize further escapement.

Emergency Order: 3-S-Z-35-07 Effective Date: September 5, 2007

EXPLANATION: This emergency order opens the northeast portion of Salmon Lake to subsistence fishing.

JUSTIFICATION: Sockeye salmon have been entering Salmon Lake since early July. This year's escapement into the lake was over 40,000 sockeye salmon and the escapement was the fourth largest on record. In the past subsistence fishers have harvested sockeye from the lake because of the ease of drying spawned out salmon. To allow opportunity for subsistence fishers to obtain sockeye salmon from Salmon Lake the northeast portion of the lake will be open to subsistence fishing until October 15. Catch limits of 100 sockeye salmon per household are in effect. Allowing fishing in the northeast portion of Salmon Lake should not jeopardize future runs.