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Alaska Subsistence and Personal Use Salmon Fisheries 2015 Annual Report

by

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Alaska Department of Fish and Game **Division of Subsistence**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the reports by the Division of Subsistence. 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	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 Subsistence Technical Paper series was established in 1979 and represents the most complete collection of information about customary and traditional uses of fish and wildlife resources in Alaska. The papers cover all regions of the state. Some papers were written in response to specific fish and game management issues. Others provide detailed, basic information on the subsistence uses of particular communities which pertain to a large number of scientific policy questions.

Technical Paper series reports are available through the Alaska Resources Library and Information Services (ARLIS), the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/. This publication has undergone editorial and professional review.

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TABLE OF CONTENTS

Page

TABLE OF CONTENTS—CONTINUED

TABLE OF CONTENTS—CONTINUED

TABLE OF CONTENTS—CONTINUED

TABLE OF CONTENTS—CONTINUED

TABLE OF CONTENTS—CONTINUED

LIST OF TABLES

Table **Page**

LIST OF TABLES—CONTINUED

LIST OF TABLES—CONTINUED

LIST OF FIGURES

Figure **Page**

ABSTRACT

Each year thousands of Alaskans participate in subsistence activities including the harvest of wild resources from Alaska’s fisheries. Subsistence fishing is an important element of Alaska's social and cultural heritage, as well as a crucial component of the subsistence sector of the state’s economy. In addition, personal use fisheries provide opportunities for Alaska residents to harvest salmon for home use using efficient methods in areas closed to subsistence fishing. This report summarizes Alaska’s 2015 subsistence and personal use salmon fisheries based upon subsistence and personal use permit data and harvest assessment surveys from across the state. New information is compared to findings from previous years and the results are discussed. Where available, information about other subsistence finfish fisheries is included. Additional information from federal agencies regulating and administering certain subsistence fisheries, beginning in 1997, is included where available.

Key words: Pacific salmon, *Oncorhynchus* spp., sheefish, whitefish, rainbow/steelhead trout, Arctic char/Dolly Varden, northern pike, Chinook salmon, coho salmon, sockeye salmon, pink salmon, chum salmon, Norton Sound, Port Clarence, Kotzebue, Yukon, Kuskokwim, Bristol Bay, Chignik, Alaska Peninsula, Aleutian Islands, Kodiak, Cook Inlet, Prince William Sound, Southeast Alaska, Yakutat, subsistence salmon fisheries, personal use salmon fisheries

CHAPTER 1: INTRODUCTION

This is the seventeenth report in a series of annual reports on Alaska's subsistence and personal use fisheries. It was prepared by the Alaska Department of Fish and Game (ADF&G) Division of Subsistence.

Alaska state law defines subsistence fishing as the taking of fish, shellfish, or other fisheries resources by Alaska residents for subsistence uses (AS 16.05.940 (31)). Subsistence uses of wild resources are defined as "noncommercial, customary and traditional uses" for a variety of purposes. These include:

> … direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation, for the making and selling of handicraft articles out of nonedible by-products of fish and wildlife resources taken for personal or family consumption, and for the customary trade, barter, or sharing for personal or family consumption … . (AS 16.05.940 (33))

Under Alaska's subsistence statute, the Alaska Board of Fisheries (BOF) must identify fish stocks that support subsistence fisheries. The BOF applies the Joint Board of Fisheries and Game Subsistence Procedures (5 AAC 99.010) to make these determinations, which are called "customary and traditional (C&T) findings." If there is a harvestable surplus of these stocks with C&T uses, the BOF must adopt regulations that provide reasonable opportunities for subsistence uses. When it is necessary to restrict harvests, the statute directs the BOF to assign a preference to subsistence uses (AS 16.05.258).

The Joint Board of Fisheries and Game (Joint Board) is required to identify "nonsubsistence areas," where "dependence upon subsistence is not a principal characteristic of the economy, culture, and way of life of the area or community" (AS 16.05.258 (c)). The Joint Board has identified 5 nonsubsistence areas: the Ketchikan Nonsubsistence Area, the Juneau Nonsubsistence Area, the Anchorage–Matsu–Kenai Nonsubsistence Area, the Fairbanks Nonsubsistence Area, and the Valdez Nonsubsistence Area (5 AAC 99.015). The BOF may not authorize subsistence fisheries in nonsubsistence areas.

Alaska state law recognizes 3 additional categories of fishing: commercial, sport, and personal use. Commercial fishing is the taking of fish "with the intent of disposing of them for profit, or by sale, barter, trade, or in commercial channels" (AS 16.05.940 (5)).

Sport fishing is defined as the taking "for personal use, and not for sale or barter, any fresh water, marine, or anadromous fish by hook and line held in the hand, or by hook and line with the line attached to a pole or rod which is held in the hand or closely attended, or by other means defined by the Board of Fisheries" (AS 16.05.940 (30)).

Personal use fishing is defined as the taking of fish "by Alaska residents for personal use and not for sale or barter, with gill or dip net, seine, fish wheel, long line, or other means defined by the Board of Fisheries" (AS 16.05.940 (25)). Personal use fisheries differ from subsistence fisheries in that they do not meet the criteria for customary and traditional fisheries as established by the Joint Board (5 AAC 99.010), or because they occur within nonsubsistence areas; in addition, a sport fishing license is required. This type of fishery provides Alaska residents with opportunities to harvest fish for noncommercial purposes, utilizing gear other than rod and reel, within nonsubsistence areas.

Every year, the ADF&G Division of Commercial Fisheries prepares Fishery Management Reports (FMRs, formerly "annual management reports," AMRs) for most fishery management areas in the state. Figure 1-1 shows the location of these management areas. Although the FMRs focus primarily on commercial fisheries, most also routinely summarize basic data for programs that collect harvest information for subsistence fisheries and for those personal use fisheries that the Division of Commercial Fisheries administers. Detailed annual reports about subsistence fisheries harvest assessment programs are prepared in the Northwest Alaska, Yukon River, and Kuskokwim River areas. Additionally, the Division of Sport Fish prepares summaries for the personal use salmon fisheries it administers in the Cook Inlet

and Prince William Sound (Upper Copper River) areas. However, until the Division of Subsistence annual subsistence fisheries report series began in 1999, there was no single source that compiled subsistence and personal use fisheries harvest data from all management areas. That is the purpose of this 2015 annual report.

The Federal Subsistence Board (FSB) adopts subsistence fishing regulations for federal waters in Alaska, in compliance with the Alaska National Interest Lands Conservation Act (ANILCA). Only eligible Alaska rural residents may participate in federal subsistence fisheries. For most subsistence fisheries, a single program administered by ADF&G provides harvest estimates for all participants regardless of the location of effort. However, for some fisheries (such as the Pacific salmon *Oncorhynchus* fisheries of the Upper Copper River District), FSB regulations require a federal subsistence fishing permit. The following chapters on each management area note where separate state and federal harvest monitoring programs operate. Unless otherwise noted, subsistence harvest estimates in this report include data from both state and federal permit programs.

It is important to recognize the limitations associated with the effort to present a comprehensive annual report on Alaska's subsistence and personal use fisheries. These limitations include:

- Annual harvest assessment programs do not take place for all subsistence fisheries. Programs are in place for most salmon fisheries, but few other finfish fisheries or shellfish fisheries have annual harvest monitoring programs.
- Annual harvest data summarized in this report are limited to fisheries classified as subsistence or personal use by regulation, which, especially for salmon, generally means fish taken with gillnets, beach seines, dip nets, or fish wheels. In some parts of Alaska, substantial numbers of fish for home uses are taken with rod and reel (considered sport gear by most state area regulations) or are retained from commercial harvests. With noted exceptions, these harvests are not included in the analysis of subsistence harvest data in this report because they are not collected by annual subsistence fisheries harvest programs. Therefore, the harvest data in this report are a conservative estimate of the number of salmon being taken for subsistence uses in Alaska. Underestimations of subsistence salmon harvests are a particular issue in the Southeast region.
- Between management areas, and sometimes between districts within management areas, there is inconsistency in how subsistence and personal use harvest data are collected, analyzed, and reported.
- In some areas there are no routine mechanisms for evaluating the quality of subsistence harvest data. For example, in some areas it is not known if all subsistence fishers are obtaining permits and providing accurate harvest reports. This can result in a significant underestimation of harvests.
- There are also few programs for contextualizing annual subsistence harvest data so as to interpret changes in harvests. In some cases, however, FMRs do contain discussions of data limitations and harvest trends.

Despite these limitations, it is nonetheless possible to present an informative, conservative statewide overview of subsistence and personal use harvests of salmon. Information for all areas of the state where subsistence and personal use salmon fisheries occur is covered in this report. Before 2010, we only included data for personal use salmon fisheries in the Yukon Management Area, the Prince William Sound Management Area (specifically, the Chitina Subdistrict of the Upper Copper River District), and the Southeast region because these fisheries were classified as subsistence fisheries in the past, and are administered in programs that collect subsistence harvest data. We did not include data from the Cook Inlet Management Area personal use salmon fisheries in past statewide overviews, primarily because most of these fisheries have relatively short histories. However, beginning in the report for 2010, we added harvest data from the Cook Inlet personal use salmon fisheries so as to provide a complete statewide summary for all subsistence and personal use salmon harvests.

The quality and quantity of subsistence harvest data for finfish other than salmon and for shellfish are very uneven. For other finfish, if annual subsistence harvest information is collected, it is included in this report if the summary data were available to the Division of Subsistence. Otherwise, we have usually noted which species are primarily used for subsistence, relying in general on baseline studies conducted by the Division of Subsistence. In a small number of instances we have drawn from reports prepared for the BOF. This annual report does not attempt to provide a comprehensive overview of subsistence shellfish harvests.

In 1988, the Division of Subsistence prepared the first version of the Historical Subsistence Salmon Harvest Database (HSSHDB). As part of the cooperative agreement that supported the development of this annual report series, this database was updated, upgraded, and renamed the Alaska Subsistence Fisheries Database (ASFDB).[1] The database is written for Microsoft Access software.[2] It is organized by 21 subsistence fisheries and is generally reflective of unique harvest assessment programs and regulatory structures. It contains harvest data organized by species, year, community of residence of permit holder, and gear type. The number of permits issued and returned each year is included as well. The most complete data sets are sought; data sets which, in some cases, are more up-to-date than those reported in FMRs.

In 2008, the division received funding from the Alaska State Legislature to develop and annually update a web-based version of the ASFDB. This version of the database was developed using Microsoft SQL Server to store the data and Adobe ColdFusion 8 to create the user interface. The final product, projected to be available to the public in 2018, will contain all historical information from the HSSHDB along with contemporary data from the ASFDB stored in Microsoft Access, and will be updated periodically with new subsistence and personal salmon fisheries data.

The historical ASFDB is not currently available online. Upon request, the Division of Subsistence distributes the database on CD-ROM, along with the Community Subsistence Information System[3], formerly the Community Profile Database (Scott et al. 2001). The CSIS includes the results of Division of Subsistence systematic household harvest surveys and is the primary source for subsistence harvest data for shellfish and for finfishes other than salmon.

In most fisheries data analysis, the Division of Subsistence expands harvest estimates from reported harvests in order to account for unreturned permits. In a few cases, this results in a larger estimate than is found in those FMRs that routinely only summarize data from returned permits. Also, the ASFDB calculates harvest estimates first for all permit holders by community represented in the fishery, and then sums these community estimates for a fishery total. This method is in contrast to the expansion method used by other divisions to analyze data from certain fisheries, such as the subsistence fishery in the Glennallen Subdistrict of the Prince William Sound Area. The harvest data analysis for this fishery presented in the FMR only considers the total number of issued and returned permits in expansion, resulting in slightly different estimates of total harvests than those in this report.

Significant modifications to data analysis procedures were implemented for 2 fisheries beginning in this 2015 report. First, as discussed in Chapter 3, there has been no annual subsistence salmon harvest monitoring program for the Kotzebue District since 2004. Few harvest estimates were developed from 2005 through 2011. Through special project funding, the Division of Subsistence conducted post-season salmon harvest surveys in selected Kotzebue District communities in 2012–2014. For this report, based on the available data, interpolated harvest estimates were developed for a set of core communities to estimate district harvests for years without post-season harvest assessment programs (primarily 2005–2011 and 2015. These estimates appear in revised historical tables in Chapter 3 and in revised statewide historical summaries in Chapter 2. Second, as noted in Chapter 11, in the past, reported harvests in the

1. David A. Caylor and Louis A. Brown. 2006. ASFDB. Alaska Department of Fish and Game Division of Subsistence, Juneau.
2. Product names are given for scientific completeness; they do not constitute product endorsement.
3. ADF&G Division of Subsistence, Community Subsistence Information System (CSIS): http://www.subsistence.adfg.state.ak.us/CSIS/.

Tyonek Subdistrict of the Cook Inlet Area have not been expanded to produce a harvest estimate. For this report, past permit return rates for this fishery were evaluated, and new, expanded harvest estimates were produced. These estimates now appear in the historical table for the Tyonek fishery, and were also used to revise statewide harvest estimates that appear in Chapter 2. Further details about the procedures used to develop these revised harvest estimates appear in Chapters 3 and 11, respectively.

It is important to note that the preparation of this annual report and the supporting database were 2 objectives of the Statewide Subsistence Fisheries Harvest Monitoring Strategy project funded by the U.S. Fish and Wildlife Service (USFWS) Office of Subsistence Management (OSM) and implemented jointly by the Division of Subsistence and the Alaska Inter-Tribal Council (AITC). A central goal of the project was to develop recommendations for a unified subsistence harvest assessment program for Alaska's subsistence fisheries. A working group composed of state, federal, and tribal members developed these recommendations. The recommendations are available as a separate document (ADF&G and AITC 2000) a final report with an overview of all the project activities is also available (Fall and Shanks 2000). The final report also includes comments on existing subsistence harvest assessment programs, based on working group discussions as well as interviews of ADF&G staff conducted by the Division of Subsistence. We have drawn on these comments for most of the evaluations of harvest data in this annual report. As background for the efforts of the working group, Division of Subsistence staff prepared detailed overviews of current subsistence fisheries harvest assessment programs. These are the basis of the program descriptions that appear in this report, with updates as necessary.

A final note regarding data ranges and averages: except where otherwise noted, averages in this report do not include the current data year (2015). Both date and numeric ranges are inclusive. The following list illustrates named-ranges used in this report and their meanings.

5-year average:	2010–2014
10-year average:	2005–2014
15-year average:	2000–2014
Historical average:	yyyy–2014, beginning of range varies depending on available data

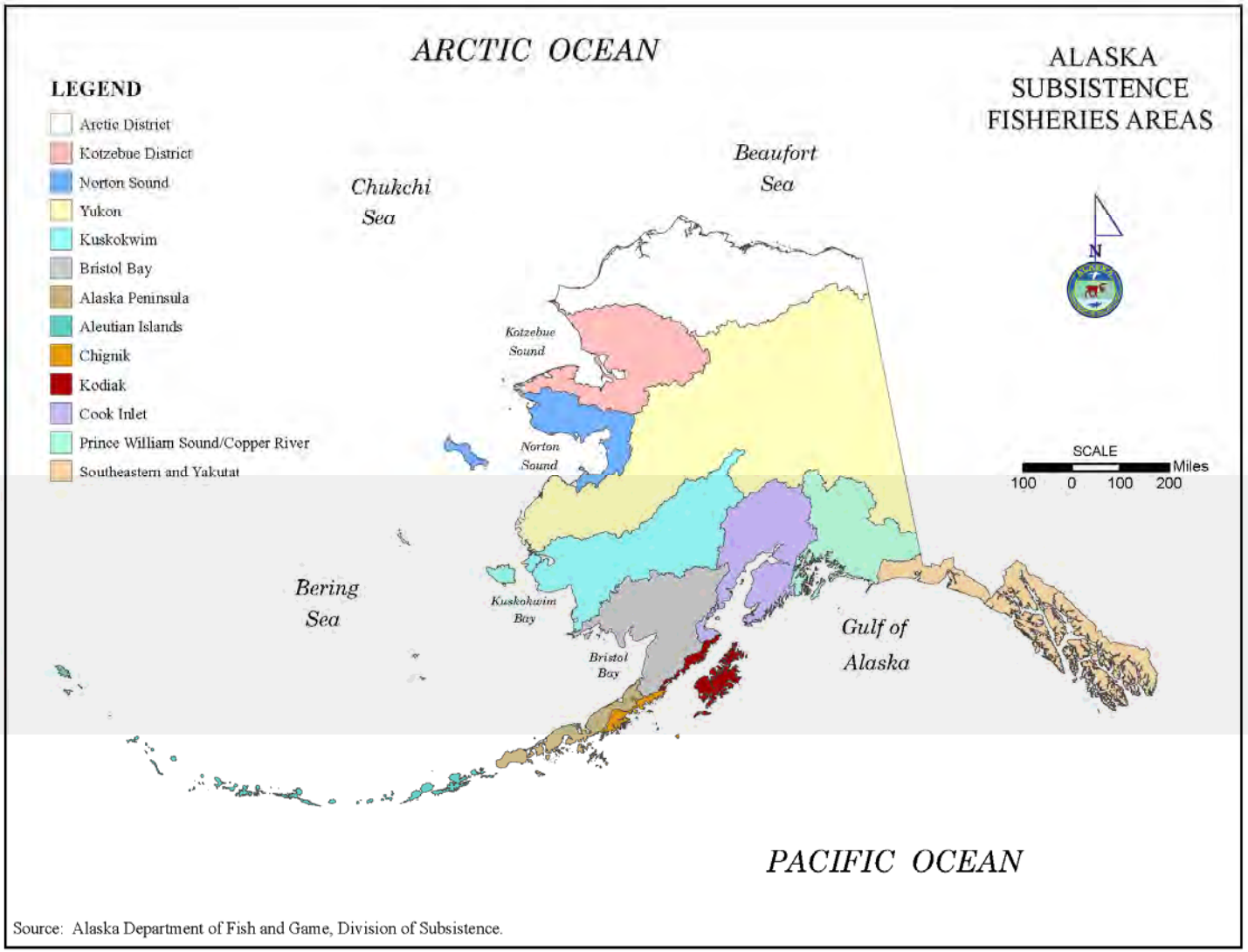

Figure 1-1.–Alaska subsistence fisheries areas.

CHAPTER 2: OVERVIEW OF SUBSISTENCE FISHERIES IN ALASKA

SUBSISTENCE HARVESTS IN RURAL ALASKA

Of the estimated 34.3 million pounds of wild foods annually harvested for subsistence purposes in rural Alaska communities, subsistence fisheries contribute about 32% from salmon, 21% from other finfish and 3% from shellfish (Fall 2016:2, 3) (Figure 2-1). On average, the subsistence fisheries harvest provides about 155 lb of food per person annually in rural Alaska (Fall 2016:2). Although they constitute a major portion of the food supply, subsistence harvests represent just a small part of the annual harvest of wild resources in Alaska: about 0.9% (fish, game, and other resources combined), as measured in usable (edible) pounds. Commercial fisheries take 98.5% of the wild resource harvest, personal use fishing and general hunting by Alaskans take 0.2%, and sport fisheries and hunts take about 0.4% of the fish and game harvest.

SUBSISTENCE SALMON HARVESTS IN 2015

The estimated total subsistence harvest of salmon in Alaska in 2015, based on annual harvest assessment programs, was 860,809 fish (Table 2-1).[1] The estimated statewide harvest by species was as follows: 351,339 sockeye salmon *O. nerka* (41%), 315,973 chum salmon *O. keta* (37%), 95,756 coho salmon *O. kisutch* (11%), 49,225 Chinook salmon *O. tshawytscha* (6%), and 48,512 pink salmon *O. gorbuscha* (5%) (Figure 2-2).

In 2015, fisheries in 9 management areas accounted for 96% of the total estimated statewide subsistence salmon harvest (Table 2-1; Figure 2-3). These were the Yukon Management Area (198,946 salmon; 23% of the statewide total); the Kuskokwim Management Area (140,431 salmon; 16%); the Bristol Bay Management Area (125,100 salmon; 15%); the Glennallen Subdistrict of the Prince William Sound Management Area (115,887 salmon; 14%); the Norton Sound-Port Clarence Area (87,411 salmon; 10%); the Kotzebue District[2] (73,154; 9%); Southeast Region[3] (including the Stikine River federal fishery) (37,955 salmon; 5%); the Kodiak Management Area (including federal permits) (20,798 salmon; 2%); and the Alaska Peninsula Area (20,693 salmon; 2%).

The largest estimated subsistence harvests of Chinook salmon in 2015 occurred in the Kuskokwim Management Area (19,437 salmon; 40%), followed by the Bristol Bay Management Area (13,874 salmon; 28%), Yukon Management Area (7,582 salmon; 15%), the Glennallen Subdistrict (2,762 salmon; 6%); and the Norton Sound-Port Clarence Area (2,588 salmon; 5%) (Figure 2-4). For sockeye salmon, the largest estimated subsistence harvests in 2015 were in the Glennallen Subdistrict (112,937 salmon; 32%), followed by the Bristol Bay Area (99,535 salmon; 28%), the Kuskokwim Management Area (39,429 salmon; 11%), the Southeast Region (including the Stikine River federal fishery) (32,321 salmon; 9%), the Kodiak Management Area (including federal permits) (16,106 salmon; 5%), the Norton Sound-Port Clarence Area (15,727 salmon; 5%), and the Chignik Area (including federal permits) (9,860 salmon; 3%) (Figure 2-5).

1. Annual reports prior to 2010 included personal use salmon harvests from Southeast Alaska and the Chitina Subdistrict of the Upper Copper River in the discussion of subsistence harvests. Beginning with the 2010 report, personal use salmon fisheries are discussed separately. One exception is the small personal use harvest that occurs in those portions of the Yukon Management Area that are within the Fairbanks Nonsubsistence Area. Also, as noted in Chapter 1, Cook Inlet Area personal use salmon harvest data have been added to the annual report.
2. See Chapter 3 for discussion of revised methods to estimate subsistence salmon harvests in the Arctic-Kotzebue Area.
3. As discussed further in Chapter 13, state subsistence regulations for the Southeast Region focus on sockeye salmon. Small harvests of Chinook and coho salmon are reported on permit returns as incidental to sockeye salmon harvests. The major portion of coho and Chinook salmon harvests for home uses in Southeast is taken with rod and reel (classified by regulation as sport gear). Thus the Southeast Region is particularly underrepresented in statewide overviews based on permit data.

In 2015, as in past recent years, 4 areas dominated the subsistence chum salmon estimated harvest: the Yukon Management Area (170,467 salmon; 54% of the statewide harvest), Kotzebue District (64,678 salmon; 20%), the Kuskokwim Management Area (43,516 salmon; 14%), and the Norton Sound-Port Clarence Area (25,769 salmon; 8%) (Figure 2-6). Of the statewide estimated subsistence harvest of coho salmon in 2015, the greatest share was taken in the Kuskokwim Management Area (36,816 salmon; 38%), followed by the Yukon Area (18,252; 19%), the Norton Sound-Port Clarence Area (16,178 salmon; 17%), Bristol Bay Management Area (7,659 salmon; 8%), the Kotzebue District (4,259 salmon; 5%), the Kodiak Management Area (including federal permits) (3,067 salmon; 3%), and the Southeast Region (including the Stikine River federal fishery) (2,671 salmon; 3%) (Figure 2-7). Finally, the largest portion by far of the statewide estimated pink salmon subsistence harvest in 2015 occurred in the Norton Sound-Port Clarence Area (27,149 salmon; 56%), followed by the Alaska Peninsula Management Area (4,919 salmon; 10%), the Southeast Region (including the Stikine River federal fishery) (3,988 salmon; 8%), the Kotzebue District (2,821 salmon; 6%), the Yukon Management Area (2,645 salmon; 6%), the Arctic District (2,594 salmon; 5%), and the Kuskokwim Area (1,233 salmon; 3%) (Figure 2-8).

Table 2-2 reports historical estimated subsistence salmon harvests for 1994 through 2015 based on annual harvest assessment programs. While earlier estimates for many of the fisheries are available, 1994 marks the first year that data from all of the included fisheries were available and collected with methods comparable to those currently in use.

The 22-year period reflected in Table 2-2 shows a general downward trend in subsistence salmon harvests in Alaska. Estimates from 2000 through 2008 suggested this trend might have been stabilizing. However, the 2013 estimate of 928,212 salmon was the ninth-lowest since 1994, with the 838,202 salmon harvested in 2009 being the second-lowest estimate, and the 896,468 salmon harvested in 2010 the fifth-lowest, up to that point since 1994. The estimate for 2012 of 959,500 was the highest since 2008. Since then, statewide estimates have declined. The 2015 estimate of 860,809, was down from 2014, was lower than the recent 5-year average (924,246 salmon), the recent 10-year average (933,942 salmon), and the historical average since 1994 (969,942 salmon). The harvest estimate for 2015 was the third-lowest since 1994, after 2009 and 2000. It should also be noted that the estimate of 42,661 Chinook salmon harvested in subsistence fisheries in 2014 was by far the lowest estimate on record, and was just 29% of the annual average since 1994 and 43% below the next-lowest annual estimate (74,381 Chinook salmon in 2012). In 2015, there was a slight increase to 49,225 Chinook, but this total is the second-lowest since 1994.

PERSONAL USE SALMON HARVESTS IN 2015

In 2015, personal use fisheries produced an estimated harvest of 787,053 salmon (Table 2-1). The Kenai River dip net fishery accounted for 49% of the statewide personal use salmon harvest (386,852 fish), followed by the Chitina Subdistrict dip net fishery (30%; 234,850 salmon), the Kasilof River dip net fishery (12%; 93,927 salmon), the Kasilof River setnet fishery (4%; 27,841 salmon), the Fish Creek (upper Cook Inlet) dip net fishery (3%; 24,239 salmon), the Southeast Region (Juneau and Ketchikan non-subsistence areas only) (1%; 8,113 salmon), and the Kachemak Bay setnet fishery (<1%; 2,066 salmon) (Figure 2-9). Sockeye salmon composed 97% of the Alaska personal use salmon harvest in 2015 (Figure 2-10).

The personal use harvest of 787,053 salmon in 2015 was the third-largest total since comprehensive records became available in 1994, only slightly lower than the record harvests of 2011 and 2012 (Table 2-3). The average annual personal use harvest since 1996 of 490,789 salmon is 62% of the 2015 total. Increased harvests in the Upper Cook Inlet personal use dip net fisheries account for most of the growth of personal use harvests since 1994 (see Chapter 11).

STATEWIDE SUBSISTENCE AND PERSONAL USE SALMON HARVESTS, 1994–2015

Table 2-4 reports historical estimated subsistence and personal use salmon harvests for 1994 through 2015 based on annual harvest assessment programs. As noted above, 1994 marks the first year that comparable data from all of the included fisheries are available.

The 22-year period reflected in Table 2-4 shows generally stable to slightly increasing statewide harvest totals: the recent (2010–2014) 5-year average harvest was 1,656,929 salmon compared to a 21-year annual average of 1,430,052 salmon. The total harvest estimate for 2015 of 1,647,862 salmon is the fourth-highest within the 22-year period, although down slightly from 2014. As noted above, however, harvests in subsistence fisheries have generally declined since 1994 while personal use harvests have increased. In 2015, sockeye salmon made up 68% of the combined subsistence and personal use salmon harvests, followed by chum (19%), coho (7%), pink (3%), and Chinook salmon (3%) (Figure 2-11).

Table 2-5 reports subsistence and personal use harvests in 2015 by species and participants' place of residence, with harvests from all subsistence and personal use fisheries combined.

Table 2-1.–Alaska subsistence and personal use salmon harvests, 2015.

Fishery	Households or permits		Estimated salmon harvest					
	Total[a]	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Subsistence								
Adak District	1	1	0	11	0	0	0	11
Alaska Peninsula Management Area	158	112	117	12,107	2,131	1,419	4,919	20,693
Arctic District[b]	1,900	432	126	519	846	4,247	2,594	8,332
Batzulnetas Fishery	4	4	0	0	0	0	0	0
Bristol Bay Management Area	1,169	1,072	13,874	99,535	7,659	3,573	458	125,100
Chignik Management Area	123	119	160	9,854	1,393	233	481	12,121
Chignik Management Area: Federal	2	2	14	6	0	0	0	20
Chitina Subdistrict: Federal	111	100	15	2,475	17	0	0	2,507
Copper River Flats	243	234	178	1,531	0	0	0	1,709
Glennallen Subdistrict	1,952	1,646	2,762	112,937	188	0	0	115,887
Kenai and Kasilof Rivers: Federal	187	180	2	2,056	0	0	0	2,058
Kodiak Management Area[a]	1,544	1,544	186	16,053	3,057	271	1,168	20,735
Kodiak Management Area: Federal	19	19	0	53	10	0	0	63
Kotzebue District[b]	1,583	854	613	783	4,259	64,678	2,821	73,154
Kuskokwim Management Area	4,349	1,615	19,437	39,429	36,816	43,516	1,233	140,431
Norton Sound - Port Clarence Area[b]	1,967	1,878	2,588	15,727	16,178	25,769	27,149	87,411
Port Graham & Koyuktolik Subdistricts[a]	5	5	36	877	47	872	539	2,371
Prince William Sound (General)	23	21	0	71	0	3	0	74
PWS Eastern District (Tatitlek)	16	4	0	110	143	8	0	261
PWS Southwestern District (Chenega Bay)	21	4	0	56	35	12	0	103
PWS/Chugach Subdistrict: Federal	94	64	0	152	893	0	0	1,045
Seldovia Fishery	8	6	16	70	0	0	4	90
Southeast Region	2,422	1,968	373	30,477	2,540	748	3,817	37,955
Stikine River Federal Fishery	125	125	71	1,844	131	46	171	2,263
Tyonek Fishery	83	72	1,070	505	568	16	6	2,165
Unalaska District	222	172	6	3,524	442	26	460	4,459
Upper Yentna Fishery	29	27	0	578	151	69	47	845

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Table 2-1.–Page 2 of 2.

Yukon Management Area[c]	3,141	1,567	7,582	0	18,252	170,467	2,645	198,946
Subtotal, Subsistence	**21,501**	**13,847**	**49,226**	**351,340**	**95,756**	**315,973**	**48,512**	**860,809**
Personal use								
Chitina Subdistrict: State[d]	12,571	10,509	1,631	232,266	953	0	0	234,850
Kachemak Bay setnet[e]	136	131	10	509	1,373	22	152	2,066
Kasilof River setnet[e]	NA	NA	61	27,567	191	2	20	27,841
Kasilof River dip net[e]	NA	NA	0	89,000	2,723	597	1,607	93,927
Kenai River dip net[e]	NA	NA	66	377,532	4,150	957	4,147	386,852
Fish Creek dip net[e]	NA	NA	0	19,260	3,321	329	1,329	24,239
Unknown Upper Cook Inlet[e]	NA	NA	0	8,626	263	41	153	9,083
Beluga River dip net	8	8	0	65	17	0	0	82
Southeast Region	601	601	49	6,417	319	408	920	8,113
Subtotal, Personal use[e]	**48,236**	**38,368**	**1,817**	**761,242**	**13,310**	**2,356**	**8,328**	**787,053**
Total	**69,737**	**52,215**	**51,043**	**1,112,582**	**109,066**	**318,329**	**56,840**	**1,647,862**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Note Included in this table are all harvest estimates based upon annual harvest monitoring programs.

a. Because the numbers of permits issued for the Kodiak and Port Graham/Koyuktolik fisheries are unknown, the numbers of permits returned are used in place of these values.
b. Formerly included within Northwest Alaska. Partial coverage for Arctic and Kotzebue Districts; see Chapter 3 for details.
c. Includes a small personal use harvest that occurs within the Fairbanks Nonsubsistence Area.
d. Reclassified as a personal use fishery in 2003.
e. A single permit is issued for the Kasilof setnet, Kasilof dip net, Kenai dip net, and Fish Creek dip net fisheries. In some cases, returned permits did not indicate the area fished. There were 34,920 permits issued and 27,119 permits returned for these fisheries.

NA = Data not available.

Table 2-2.–Historical Alaska subsistence salmon harvests, 1994–2015.

Year	Households or permits		Estimated salmon harvest					
	Total	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1994	16,336	10,770	184,437	339,428	136,707	460,410	95,104	1,216,085
1995	15,596	10,328	181,120	291,549	120,081	499,995	54,908	1,147,653
1996	16,512	11,789	158,945	320,841	121,422	498,528	80,935	1,180,671
1997	17,668	12,863	177,115	376,495	98,987	347,813	41,543	1,041,955
1998	17,772	12,513	170,674	328,945	93,088	302,038	74,216	968,961
1999	17,290	12,763	155,477	358,969	89,708	338,360	32,435	974,951
2000	16,678	12,765	131,126	296,890	99,354	247,337	51,716	826,423
2001	18,762	13,100	162,120	340,494	98,563	243,963	42,460	887,600
2002	17,986	13,390	143,078	299,453	92,912	274,189	85,788	895,420
2003	18,602	13,332	164,826	324,728	107,111	258,300	67,076	922,041
2004	18,845	13,657	174,222	332,735	101,511	267,259	91,877	967,603
2005	17,211	11,535	153,752	323,517	99,741	310,075	77,064	964,147
2006	18,120	12,066	140,581	316,472	98,090	346,208	76,842	978,194
2007	18,131	10,959	155,386	320,368	80,600	325,009	34,562	915,923
2008	18,216	11,777	174,557	315,544	115,515	329,099	87,009	1,021,725
2009	18,119	12,142	141,634	296,948	88,685	271,774	39,162	838,202
2010	17,152	11,915	133,663	327,162	82,387	293,118	60,137	896,468
2011	18,485	12,755	129,060	342,327	79,847	316,072	36,742	904,047
2012	19,197	12,123	74,738	344,472	80,638	390,464	69,187	959,500
2013	19,275	13,343	84,363	348,294	81,752	383,691	30,111	928,212
2014	21,577	14,236	42,843	348,753	115,203	357,582	68,622	933,002
2015	21,501	13,847	49,225	351,339	95,756	315,973	48,512	860,809
5-year average (2010–2014)	19,137	12,874	92,934	342,202	87,966	348,185	52,960	924,246
10-year average (2005–2014)	18,548	12,285	123,058	328,386	92,246	332,309	57,944	933,942
Historical average (1994–2014)	17,978	12,387	144,463	328,304	99,138	336,252	61,786	969,942

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Note Included in this table are all harvest estimates based upon annual harvest monitoring programs.

Table 2-3.–Historical Alaska personal use salmon harvests, 1994–2015.

Year	Households or permits		Estimated salmon harvest					
	Total	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1994	7,346	6,223	5,524	142,944	15,810	1,619	2,831	168,729
1995	6,997	5,674	7,029	139,861	18,455	1,672	1,579	168,596
1996	22,071	20,707	4,360	241,293	11,562	374	3,995	261,585
1997	24,281	22,939	6,318	298,151	2,753	100	1,101	308,424
1998	25,764	23,155	7,430	314,131	6,302	225	2,100	330,187
1999	27,907	24,587	7,630	360,885	5,485	1,062	3,097	378,159
2000	25,007	22,006	4,653	274,422	9,576	1,555	3,782	293,988
2001	27,017	23,392	4,631	365,875	6,990	1,746	4,037	383,279
2002	24,921	20,560	3,449	358,608	6,965	1,512	10,044	380,578
2003	26,101	21,707	3,766	394,928	6,004	1,446	3,387	409,532
2004	30,673	25,205	3,775	470,804	8,220	1,729	3,571	488,100
2005	30,817	26,677	3,367	508,419	6,350	1,218	3,776	523,130
2006	27,545	23,772	4,263	354,130	7,600	1,212	13,741	380,946
2007	31,855	27,922	4,773	496,317	6,139	797	4,267	512,294
2008	32,582	27,935	3,646	410,298	7,991	927	13,051	435,913
2009	38,443	32,800	1,654	558,352	6,872	873	7,705	575,456
2010	41,505	33,580	1,826	660,892	11,475	1,212	7,393	682,797
2011	44,208	35,265	2,661	773,540	9,714	1,461	6,371	793,747
2012	44,759	35,535	830	776,604	8,972	832	6,107	793,345
2013	46,287	35,900	888	649,597	8,489	1,356	4,973	665,303
2014	48,280	37,866	936	684,462	13,197	2,334	27,294	728,225
2015	48,236	38,368	1,817	761,242	13,310	2,356	8,328	787,053
5-year average (2010–2014)	45,008	35,629	1,428	709,019	10,369	1,439	10,428	732,683
10-year average (2005–2014)	38,628	31,725	2,484	587,261	8,680	1,222	9,468	609,116
Historical average (1996–2014)	32,633	27,448	3,729	471,142	7,929	1,156	6,831	490,789

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Note Included in this table are all harvest estimates based upon annual harvest monitoring programs.

Table 2-4.–Historical Alaska subsistence and personal use salmon harvests, 1994–2015.

	Households or permits		Estimated salmon harvest					
Year	Total	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1994	23,682	16,993	189,961	482,372	152,517	462,029	97,935	1,384,814
1995	22,593	16,002	188,150	431,410	138,536	501,667	56,487	1,316,249
1996	38,583	32,496	163,306	562,134	132,984	498,902	84,929	1,442,256
1997	41,949	35,802	183,434	674,646	101,741	347,914	42,644	1,350,379
1998	43,536	35,668	178,104	643,076	99,390	302,263	76,316	1,299,148
1999	45,197	37,350	163,107	719,855	95,193	339,422	35,532	1,353,110
2000	41,685	34,771	135,780	571,311	108,930	248,892	55,498	1,120,410
2001	45,779	36,492	166,751	706,369	105,553	245,709	46,497	1,270,879
2002	42,907	33,950	146,527	658,060	99,877	275,701	95,832	1,275,998
2003	44,703	35,039	168,592	719,656	113,116	259,746	70,463	1,331,573
2004	49,518	38,862	177,997	803,539	109,731	268,988	95,448	1,455,704
2005	48,028	38,212	157,119	831,936	106,091	311,292	80,840	1,487,278
2006	45,665	35,838	144,844	670,602	105,690	347,420	90,583	1,359,140
2007	49,986	38,881	160,159	816,685	86,738	325,805	38,830	1,428,217
2008	50,798	39,712	178,203	725,843	123,506	330,026	100,060	1,457,638
2009	56,562	44,942	143,288	855,300	95,556	272,647	46,867	1,413,658
2010	58,657	45,495	135,489	988,054	93,862	294,330	67,530	1,579,265
2011	62,693	48,020	131,721	1,115,867	89,561	317,533	43,113	1,697,794
2012	63,956	47,658	75,568	1,121,076	89,610	391,296	75,294	1,752,845
2013	65,562	49,243	85,251	997,891	90,241	385,047	35,084	1,593,515
2014	69,857	52,102	43,780	1,033,215	128,400	359,917	95,916	1,661,227
2015	69,737	52,215	51,042	1,112,581	109,066	318,329	56,840	1,647,862
5-year average (2010–2014)	64,145	48,504	94,362	1,051,221	98,335	349,625	63,387	1,656,929
10-year average (2005–2014)	57,176	44,010	125,542	915,647	100,926	333,531	67,412	1,543,058
Historical average (1994–2014)	48,185	37,787	148,435	768,043	107,944	337,455	68,176	1,430,052

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Note Included in this table are all harvest estimates based upon annual harvest monitoring programs.

Table 2-5.–Alaska subsistence salmon harvests by species and place of residence, 2015.

Community	Households or permits		Estimated salmon harvest					
	Total	Included[a]	Chinook	Sockeye	Coho	Chum	Pink	Total
Adak	1	1	0	11	0	0	0	11
Akhiok	4	3	0	138	13	0	33	184
Akiachak	158	104	1,103	2,562	1,924	2,085	58	7,733
Akiak	89	46	610	1,867	1,423	2,385	189	6,475
Akutan	1	1	0	0	0	0	0	0
Alakanuk	143	58	436	0	581	5,536	15	6,568
Alatna	7	4	0	0	12	122	0	134
Aleknagik	23	21	626	1,445	60	55	0	2,186
Allakaket	55	17	35	0	40	2,979	0	3,054
Ambler	76	56	4	103	189	3,201	200	3,697
Anaktuvuk Pass	3	2	1	27	0	0	0	29
Anchor Point	293	250	3	4,354	30	7	39	4,434
Anchorage	20,925	16,087	1,503	326,915	5,376	1,299	3,849	338,942
Anderson	10	9	0	228	0	0	6	234
Angoon	101	78	0	629	35	0	13	677
Aniak	180	92	542	2,408	7,705	1,412	305	12,372
Anvik	32	23	58	0	46	1,457	0	1,561
Arctic Village	3	3	0	45	0	0	0	45
Atmautluak	68	44	514	1,173	311	2,277	31	4,306
Atqasuk	1	1	0	23	0	0	0	23
Auke Bay	6	6	0	56	0	0	2	58
Barrow	1,689	314	146	2,145	518	3,646	1,265	7,721
Beaver	26	16	69	0	0	76	0	145
Beluga	1	1	5	10	0	0	0	15
Bethel	2,098	400	4,948	12,608	12,295	11,828	174	41,853
Bettles	30	11	0	0	0	0	0	0
Big Lake	296	209	24	5,052	95	30	59	5,260
Birch Creek	13	7	0	0	0	0	0	0
Bird Creek	2	2	0	57	0	0	0	57
Brevig Mission	45	45	29	1,761	403	1,967	1,918	6,078
Buckland	98	87	299	231	917	3,048	494	4,989
Cantwell	14	11	0	239	0	0	1	240
Central	14	13	57	140	0	0	0	197
Chalkyitsik	33	19	0	0	0	171	0	171
Chefornak	2	1	0	11	0	0	0	12
Chenega Bay	3	1	0	11	0	0	0	12
Chevak	1	0	0	11	0	0	0	12
Chickaloon	20	16	0	283	3	0	1	287
Chicken	2	2	0	11	0	0	0	11
Chignik Bay	14	12	63	1,258	35	0	2	1,358
Chignik Lagoon	22	22	68	2,819	153	0	10	3,050
Chignik Lake	20	20	2	2,250	125	0	4	2,381
Chiniak	22	22	13	227	50	9	23	322
Chistochina	5	5	3	786	0	0	0	789
Chitina	31	25	25	2,148	12	0	0	2,185
Chuathbaluk	30	25	90	382	166	342	5	985
Chugiak	927	762	63	15,948	261	52	83	16,406

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Table 2-5.–Page 2 of 6.

Community	Households or permits		Estimated salmon harvest					
	Total	Included[a]	Chinook	Sockeye	Coho	Chum	Pink	Total
Circle	19	18	129	26	0	1,652	0	1,807
Clam Gulch	49	41	1	744	3	1	3	752
Clarks Point	10	10	59	598	214	57	13	941
Clear	12	10	1	281	0	0	3	286
Coffman Cove	9	6	0	0	0	0	0	0
Cold Bay	21	20	0	795	0	0	0	795
Cooper Landing	122	115	0	1,528	1	0	2	1,531
Copper Center	161	144	152	12,750	0	0	1	12,903
Copperville	4	3	63	448	85	0	0	596
Cordova	316	275	166	1,983	895	0	1	3,046
Craig	103	74	0	1,398	45	21	125	1,589
Crooked Creek	31	24	78	303	275	383	2	1,041
Delta Junction	489	444	111	14,181	13	0	1	14,306
Denali National Park	48	43	4	887	10	0	8	910
Dillingham	347	331	6,697	13,691	3,673	1,452	235	25,748
Douglas	57	54	4	304	79	2	113	502
Dutch Harbor	103	80	0	1,622	83	0	121	1,826
Eagle	27	27	395	85	5	17,185	13	17,683
Eagle River	2,696	2,291	208	44,438	641	69	411	45,767
Edna Bay	1	1	0	0	0	0	0	0
Eek	93	47	850	1,122	629	1,023	21	3,646
Egegik	7	4	5	189	81	23	9	306
Eielson AFB	127	111	18	2,312	117	0	1	2,448
Ekwok	21	20	749	379	327	164	0	1,618
Elfin Cove	6	5	0	0	0	0	0	0
Elim	50	50	193	154	1,114	1,519	1,519	4,499
Emmonak	189	94	612	0	852	13,217	7	14,688
Ester	92	76	19	2,585	10	0	1	2,616
Fairbanks	4,458	3,770	1,138	91,494	3,859	7,024	103	103,618
False Pass	9	2	5	23	900	0	0	927
Fort Greely	33	29	6	396	46	0	0	448
Fort Wainwright	214	165	31	3,215	25	0	6	3,277
Fort Yukon	225	71	480	0	2	6,257	0	6,739
Fox	1	0	0	0	0	0	0	0
Fritz Creek	35	32	1	636	1	1	1	640
Gakona	39	38	66	2,502	0	0	0	2,568
Galena	150	52	375	172	654	3,601	16	4,818
Gambell	3	1	0	92	1	0	0	94
Girdwood	266	224	31	4,104	26	4	23	4,188
Glennallen	126	112	112	6,722	1	0	1	6,836
Golovin	32	32	64	53	309	405	2,750	3,581
Goodnews Bay	19	36	220	797	552	197	13	1,779
Grayling	54	23	22	0	212	1,693	0	1,927
Gulkana	6	3	0	0	0	0	0	0
Gustavus	38	34	0	440	2	3	88	534
Haines	409	398	17	4,801	315	396	2,055	7,584
Halibut Cove	1	0	0	11	0	0	0	12

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Table 2-5.–Page 3 of 6.

Community	Households or permits		Estimated salmon harvest					
	Total	Included[a]	Chinook	Sockeye	Coho	Chum	Pink	Total
Healy	102	91	4	1,507	727	834	24	3,097
Hollis	24	18	0	655	41	13	107	816
Holy Cross	66	35	68	41	246	1,184	0	1,540
Homer	890	747	34	14,223	120	56	129	14,562
Hoonah	112	82	0	1,021	110	4	44	1,179
Hooper Bay	223	93	534	11	95	11,949	451	13,041
Hope	57	53	0	568	1	1	0	571
Houston	61	48	12	1,006	65	10	10	1,102
Hughes	33	30	4	0	16	1,989	0	2,009
Huslia	89	37	35	30	294	3,846	0	4,205
Hydaburg	50	28	0	1,152	25	63	77	1,316
Igiugig	8	4	22	1,228	0	4	0	1,254
Iliamna	38	35	8	9,618	0	0	0	9,626
Indian	10	9	1	174	0	0	0	176
Joint Base Elmendorf Richardson	406	297	6	5,185	206	10	93	5,502
Juneau	662	596	67	5,784	323	41	792	7,007
Kake	156	130	16	1,439	28	46	90	1,618
Kaktovik	7	4	2	45	1	0	0	48
Kaltag	54	19	119	0	18	1,471	0	1,608
Karluk	0	0	0	0	0	0	0	0
Kasaan	17	12	0	336	16	0	3	354
Kasigluk	108	63	438	1,442	446	2,080	5	4,411
Kasilof	473	405	9	7,922	73	10	34	8,048
Kenai	1,795	1,439	56	27,885	292	32	226	28,492
Kennicott	4	3	0	5	0	0	0	5
Kenny Lake	55	48	42	2,753	4	0	0	2,799
Ketchikan	273	199	13	3,918	42	388	388	4,750
Kiana	102	70	4	26	88	2,053	167	2,339
King Cove	40	25	0	3,044	1,080	75	137	4,335
King Salmon	87	81	148	7,397	97	78	20	7,741
Kipnuk	1	1	19	30	0	0	0	49
Klawock	112	68	0	2,548	262	5	63	2,877
Klukwan	10	9	0	224	30	12	26	292
Kobuk	34	28	2	0	6	2,156	54	2,218
Kodiak (city)	1,209	1,204	200	12,769	2,060	217	936	16,181
Kokhanok	20	17	4	8,482	0	0	0	8,486
Koliganek	10	10	627	768	308	382	0	2,085
Kongiganak[b]	90	0	--	--	--	--	--	--
Kotlik	124	54	661	0	438	6,316	14	7,429
Kotzebue	626	177	123	1,083	222	25,282	170	26,881
Koyuk	83	78	254	148	952	3,457	1,602	6,414
Koyukuk	45	11	26	0	416	2,838	0	3,280
Kwethluk	174	100	900	2,071	1,678	2,390	81	7,120
Kwigillingok	2	0	0	22	1	0	0	24
Larsen Bay	19	18	14	560	16	14	6	610
Levelock	7	3	12	464	0	0	0	476
Lime Village[b]	14	0	--	--	--	--	--	--

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Table 2-5.–Page 4 of 6.

Community	Households or permits		Estimated salmon harvest					
	Total	Included[a]	Chinook	Sockeye	Coho	Chum	Pink	Total
Lower Kalskag	74	42	351	492	419	1,341	31	2,634
Manley Hot Springs	14	13	123	60	1,263	1,706	0	3,152
Manokotak	32	31	115	2,525	244	43	19	2,946
Marshall	105	37	128	0	1,511	6,082	0	7,721
McCarthy	37	29	0	215	17	0	0	233
McGrath	122	63	79	276	173	11	0	540
Mendeltna	1	1	0	14	0	0	0	14
Mentasta Lake	5	4	0	437	0	0	0	438
Metlakatla	1	0	0	0	0	0	0	0
Minto	35	35	24	46	270	140	0	480
Moose Pass	31	27	0	391	2	0	4	398
Mountain Village	171	61	370	0	723	7,461	57	8,611
Nabesna	3	3	2	166	0	0	0	168
Naknek	95	88	269	11,905	357	69	29	12,628
Nanwalek	2	2	0	60	0	0	0	60
Napakiak	99	48	917	1,179	1,117	1,513	47	4,773
Napaskiak	104	62	816	2,041	1,353	2,240	32	6,482
Naukati Bay	7	3	0	47	0	0	0	47
Nelchina	3	2	9	107	0	0	0	116
Nelson Lagoon	3	2	12	267	66	11	5	360
Nenana	77	71	266	1,091	2,712	3,211	0	7,281
New Stuyahok	43	36	2,914	1,639	603	676	27	5,860
Newhalen	2	2	0	573	0	0	0	573
Nikiski	244	198	11	4,041	28	10	25	4,115
Nikolaevsk	20	18	0	324	1	0	2	328
Nikolai	36	31	301	400	400	2,000	4	3,105
Ninilchik	226	196	12	2,558	14	13	15	2,612
Noatak	131	98	14	101	981	5,337	79	6,511
Nome	1,125	1,114	106	12,847	2,179	5,337	4,246	24,716
Nondalton	22	14	0	8,762	0	0	0	8,762
Noorvik	139	96	25	124	722	15,339	456	16,667
North Pole	1,348	1,140	249	30,957	270	3	22	31,501
Northway	10	9	3	651	0	0	0	654
Nuiqsut	109	58	0	13	0	261	99	374
Nulato	82	39	33	29	48	2,254	0	2,365
Nunam Iqua (Sheldon Point)	42	25	210	0	229	2,449	352	3,240
Nunapitchuk	121	76	1,051	2,920	1,154	3,883	96	9,104
Old Harbor	18	18	2	461	367	13	58	901
Oscarville	15	12	120	297	25	362	7	811
Other communities	54	54	7	0	0	279	0	286
Ouzinkie	30	30	10	1,016	327	43	54	1,450
Palmer	2,626	2,143	307	45,838	741	140	401	47,428
Pedro Bay	14	14	2	2,519	0	0	0	2,521
Pelican	4	3	0	24	0	0	0	24
Perryville	35	33	35	2,050	1,046	213	454	3,798
Peters Creek	2	2	1	18	0	0	0	19
Petersburg	152	147	31	2,081	218	48	109	2,487

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Table 2-5.–Page 5 of 6.

Community	Households or permits		Estimated salmon harvest					
	Total	Included[a]	Chinook	Sockeye	Coho	Chum	Pink	Total
Pilot Point	8	5	9	299	102	5	0	415
Pilot Station	122	62	382	25	305	6,048	0	6,760
Pitkas Point	33	23	44	0	72	1,397	288	1,801
Platinum	262	15	11	148	87	16	5	267
Point Baker	5	4	0	1	0	5	0	7
Point Hope	180	108	142	56	1,178	1,723	1,170	4,269
Point Lay	64	41	32	383	142	258	1,151	1,966
Port Alexander	3	3	0	100	0	0	0	100
Port Alsworth	56	54	0	6,665	43	0	2	6,710
Port Graham	4	4	36	842	47	872	539	2,336
Port Heiden	1	1	0	35	0	0	0	35
Port Lions	28	28	1	967	175	0	33	1,176
Port Moller	1	1	0	159	0	0	0	159
Port Protection	1	1	0	0	0	0	0	0
Prudhoe Bay	1	0	0	0	0	0	0	0
Quinhagak	74	97	3,082	1,077	2,238	691	46	7,134
Rampart	4	4	1	0	2	186	0	189
Red Devil	9	4	52	88	214	48	0	402
Ruby	66	24	68	18	185	801	0	1,072
Russian Mission	76	31	365	0	154	3,075	0	3,594
Saint Michael	97	89	475	67	763	4,634	237	6,177
Saint Paul Island	3	1	0	67	1	0	0	69
Salcha	76	58	12	1,525	2	0	0	1,539
Sand Point	43	29	54	6,821	77	1,306	4,775	13,033
Savoonga	1	1	0	0	0	0	0	0
Saxman	22	16	1	448	3	19	7	479
Scammon Bay	119	51	432	0	79	8,717	1,414	10,642
Selawik	179	125	0	70	7	1,678	5	1,761
Seldovia	26	23	16	644	0	20	21	701
Seward	192	160	11	2,904	14	59	23	3,011
Shageluk	25	16	14	0	28	256	0	298
Shaktoolik	67	60	168	211	2,080	482	4,975	7,916
Shishmaref	2	2	0	8	21	0	0	29
Shungnak	67	48	0	30	15	4,861	27	4,932
Sitka	513	443	1	6,786	342	26	278	7,433
Skagway	42	39	0	192	0	0	125	318
Skwentna	14	13	0	209	48	25	32	314
Slana	23	23	2	2,018	0	0	0	2,020
Sleetmute	36	23	137	497	752	337	4	1,727
Soldotna	2,095	1,773	41	31,709	203	44	147	32,143
South Naknek	22	17	60	2,725	250	54	54	3,143
St Marys	135	55	261	0	391	9,827	18	10,497
Stebbins	133	98	299	15	2,122	2,798	359	5,594
Sterling	489	433	4	7,087	22	3	49	7,165
Stevens Village	9	2	0	0	0	0	0	0
Stony River	13	11	25	91	77	44	0	237
Sutton	156	129	18	2,414	74	2	46	2,554
Takotna	21	16	3	0	53	0	0	56

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Table 2-5.–Page 6 of 6.

Community	Households or permits		Estimated salmon harvest					
	Total	Included[a]	Chinook	Sockeye	Coho	Chum	Pink	Total
Talkeetna	119	91	32	2,051	124	37	27	2,271
Tanacross	2	2	0	77	0	0	0	77
Tanana	97	43	142	11	2,434	22,789	13	25,389
Tatitlek	6	2	0	76	35	12	0	123
Tazlina	41	38	125	3,742	0	0	0	3,867
Telida[b]	2	0	--	--	--	--	--	--
Teller	43	43	20	832	73	1,423	649	2,997
Tenakee Springs	3	3	0	6	0	0	6	12
Thorne Bay	20	15	0	31	0	0	27	58
Togiak	49	44	874	2,365	650	310	23	4,223
Tok	87	77	24	5,739	2	0	1	5,767
Toksook Bay	2	2	0	4	0	0	0	4
Tolsona	1	1	3	67	0	0	0	70
Tonsina	6	4	0	302	0	0	0	302
Trapper Creek	41	36	1	708	29	0	7	745
Tuluksak	95	63	231	1,037	623	1,747	27	3,665
Tuntutuliak	93	59	1,668	2,001	362	2,143	23	6,197
Tununak	1	1	0	0	0	0	0	0
Twin Hills	1	1	2	47	0	5	0	54
Two Rivers	27	24	5	864	0	0	0	869
Tyonek	60	54	878	394	516	14	6	1,808
Ugashik	8	7	38	502	78	2	0	619
Unalakleet	270	226	961	395	5,674	2,381	7,545	16,957
Unalaska	112	89	4	1,805	359	26	339	2,534
Upper Kalskag	63	37	334	759	384	742	28	2,247
Valdez	355	300	115	9,545	27	8	1	9,697
Venetie	75	23	308	0	24	2,423	0	2,755
Wainwright	146	76	27	88	209	89	97	510
Ward Cove	1	1	0	0	0	0	0	0
Wasilla	5,812	4,593	692	106,965	2,645	227	1,322	111,851
Whale Pass	1	0	0	0	0	0	0	0
White Mountain	43	43	42	16	512	1,311	1,326	3,207
Whittier	10	9	0	46	0	0	0	47
Willow	220	189	34	3,928	51	12	26	4,052
Wiseman	2	1	0	46	0	0	0	47
Wrangell	189	167	55	2,038	122	94	189	2,497
Yakutat	123	117	321	3,851	956	8	162	5,297
Other USA	13	13	1	188	0	0	1	190
Unknown community	662	355	15	6,867	1,549	72	231	8,734
Total	**69,737**	**52,215**	**51,042**	**1,112,581**	**109,066**	**318,329**	**56,840**	**1,647,862**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. "Included" is the sample size or the number of permits returned.

b. These communities were not contacted during the 2015 study period. Not enough data was available to estimate harvest.

c. "Other communities" includes residents of the Upper Tanana River drainage communities of Delta Junction, Dot Lake, Northway, Tanacross, and Tok. Also includes residents from Chugiak, Lake Minchumina, Nenana, Palmer, Wasilla, and Wiseman who were issued a subsistence and/or personal use permit for the Yukon Area.

-- Data not available.

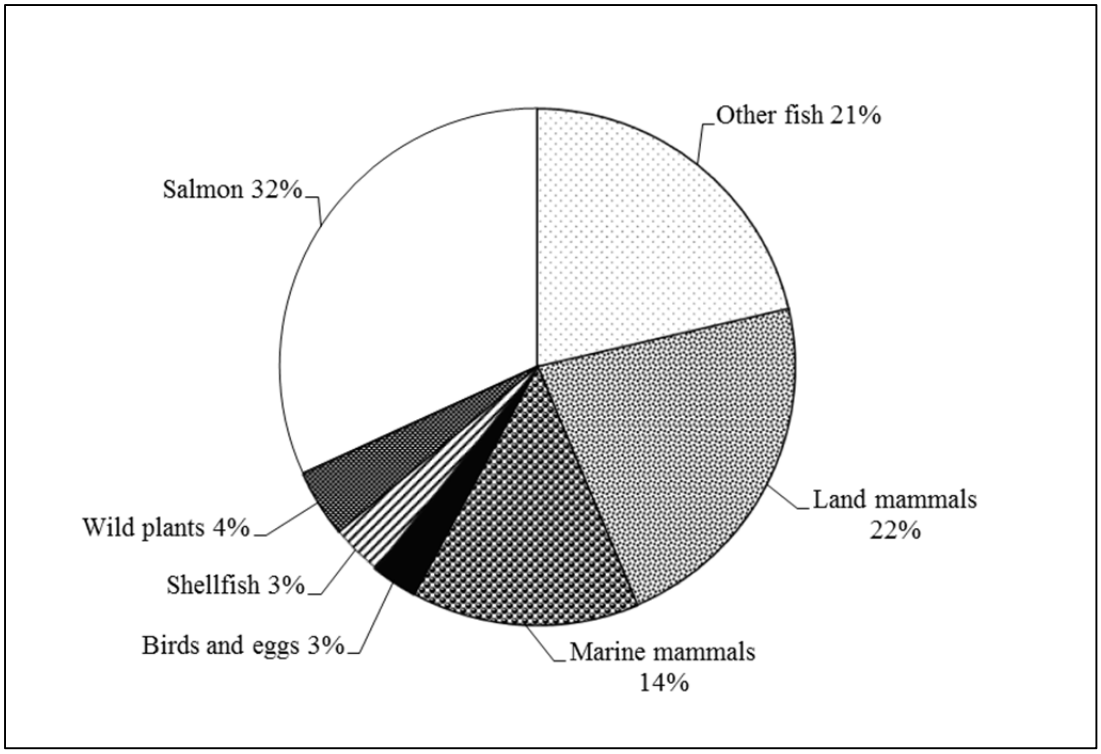


Figure 2-1.–Composition of subsistence harvest by rural Alaska residents, 2014.

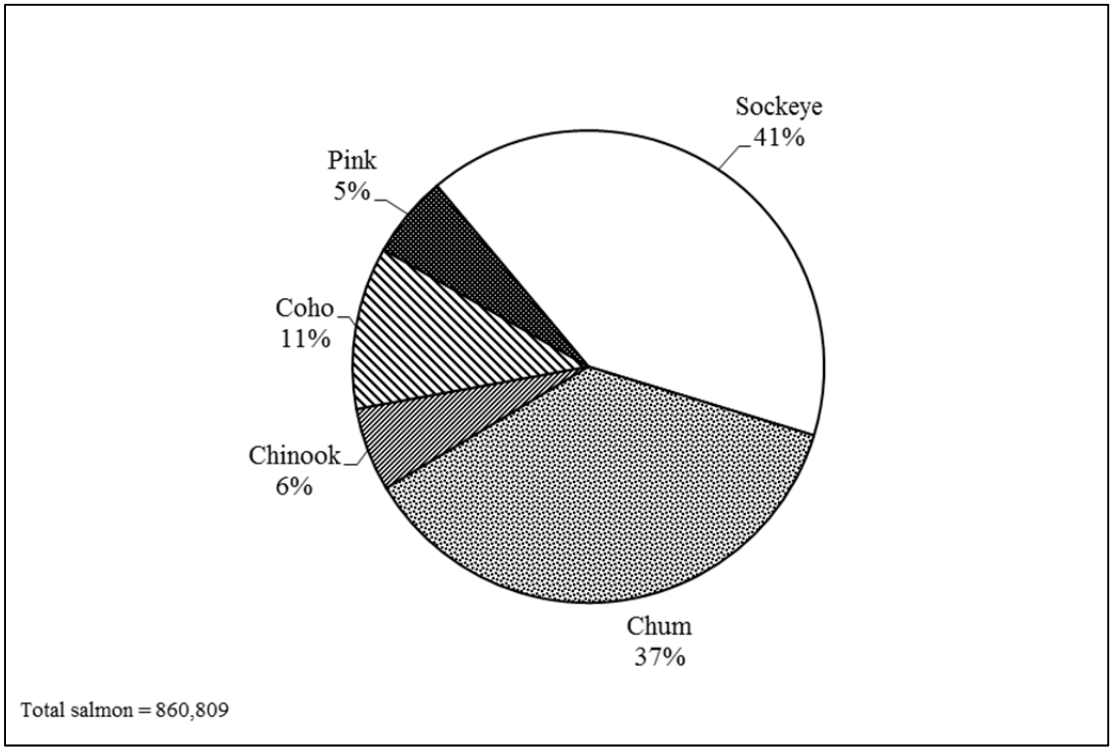


Figure 2-2.–Alaska subsistence salmon harvest by species, 2015.

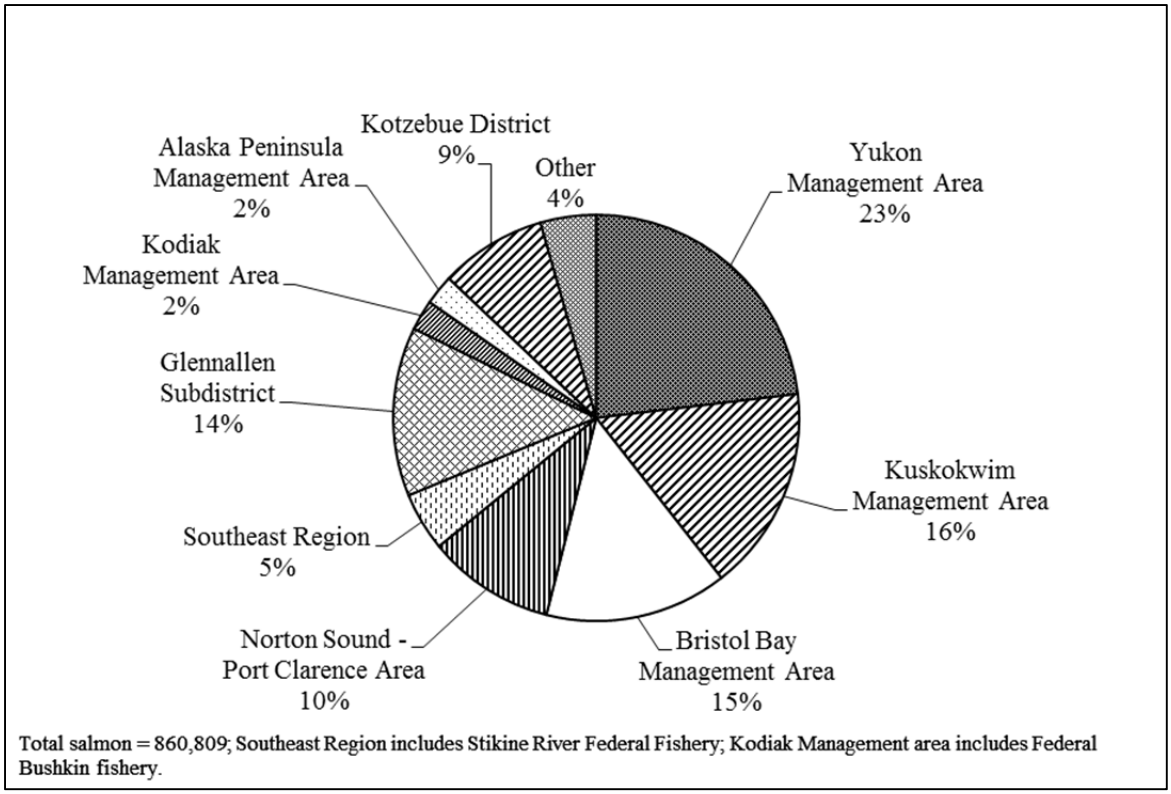


Figure 2-3.–Alaska subsistence salmon harvest by area, 2015.

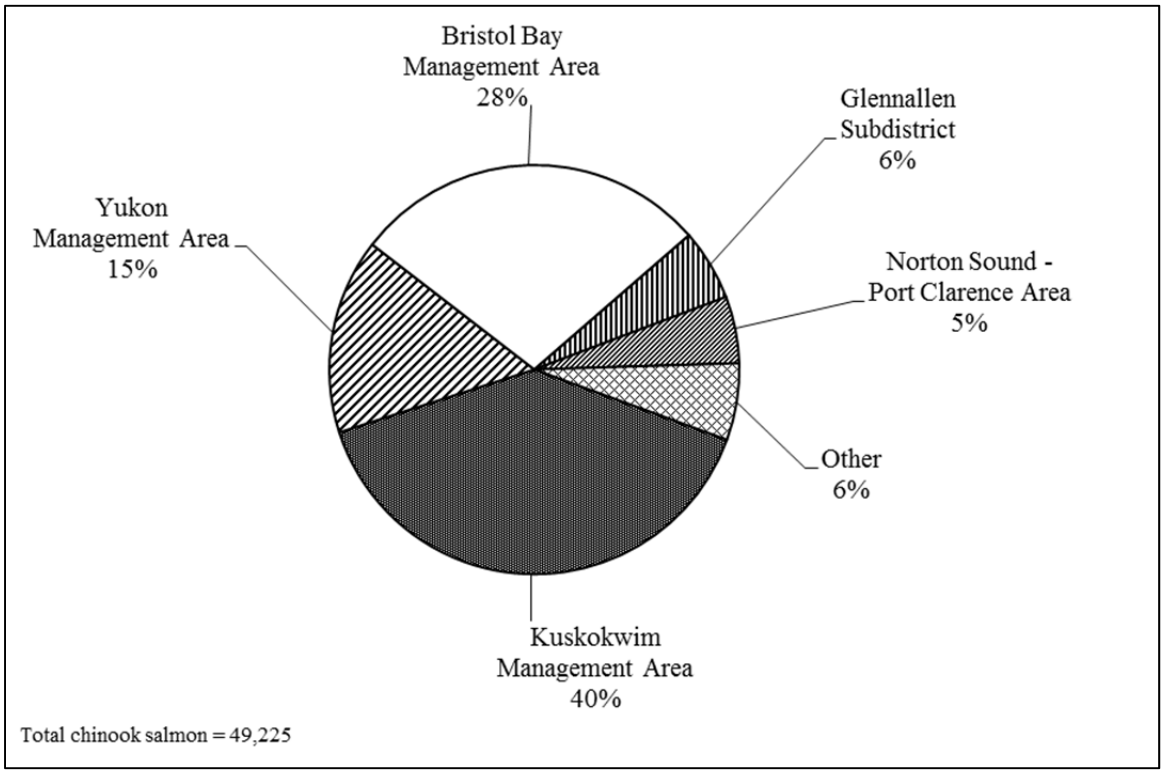


Figure 2-4.–Subsistence Chinook salmon harvest by area, 2015.

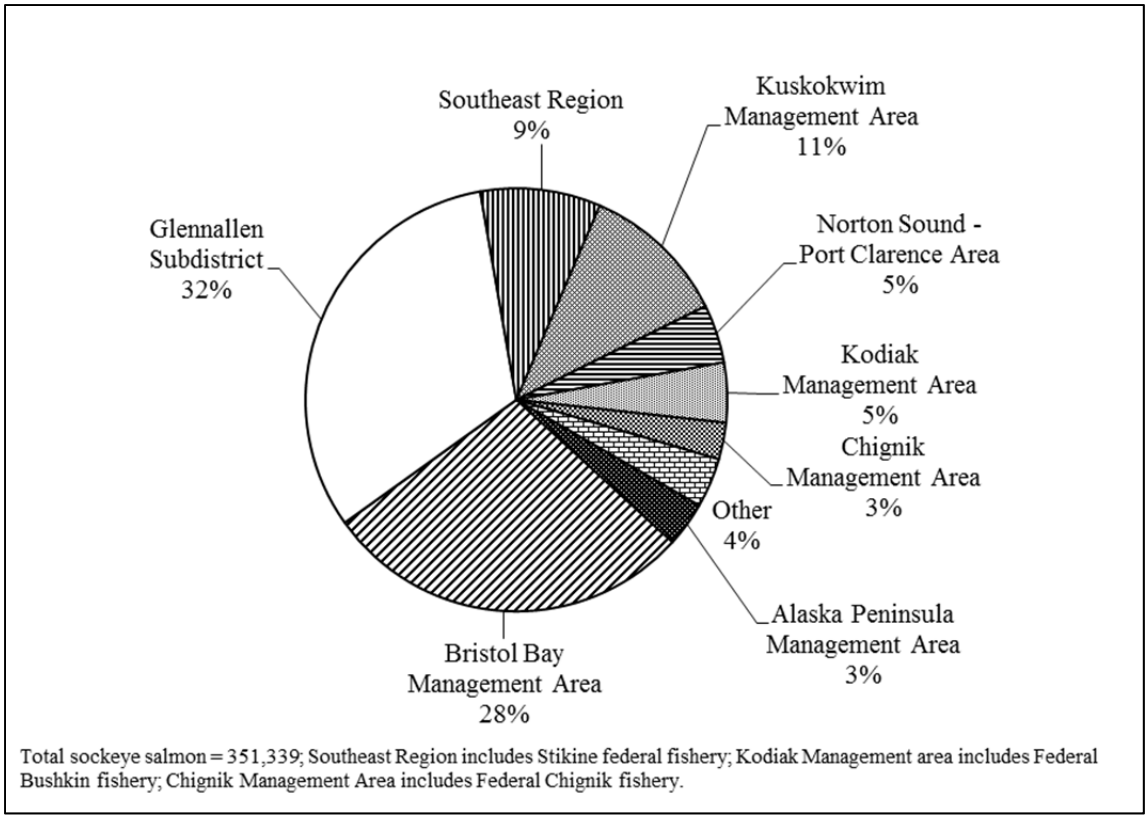


Figure 2-5.–Subsistence sockeye salmon harvest by area, 2015.

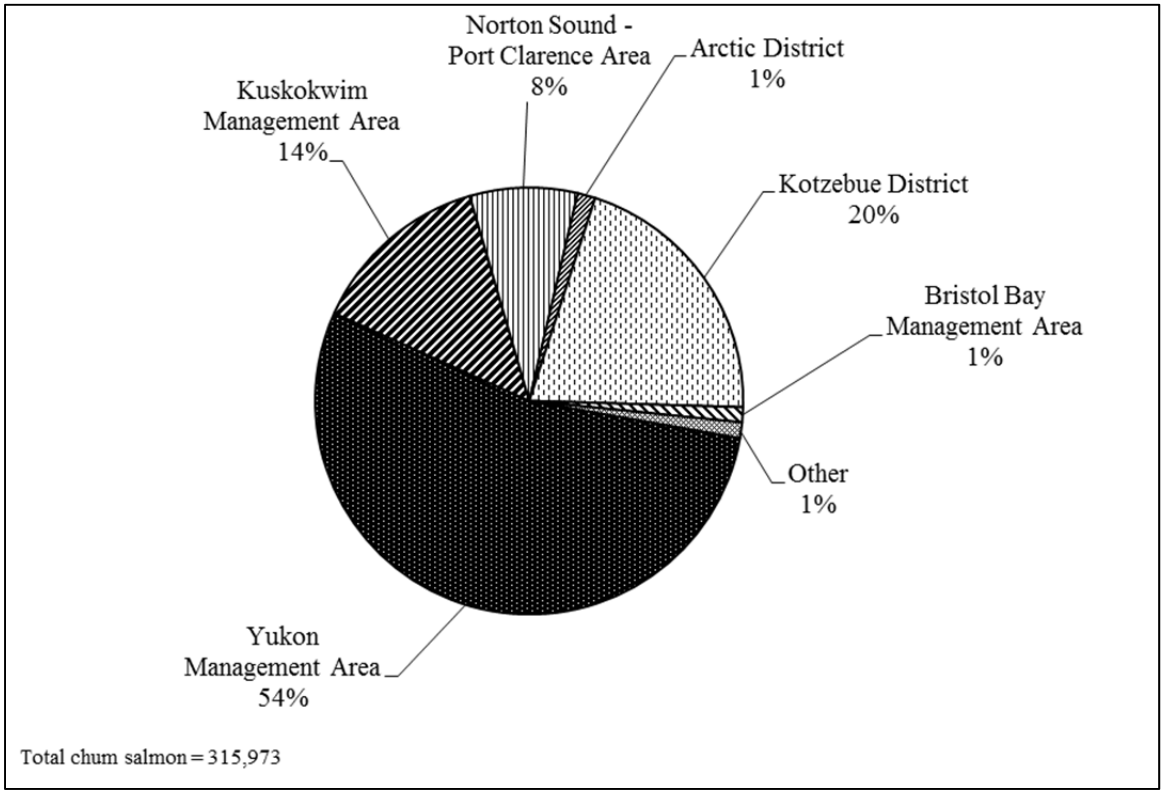
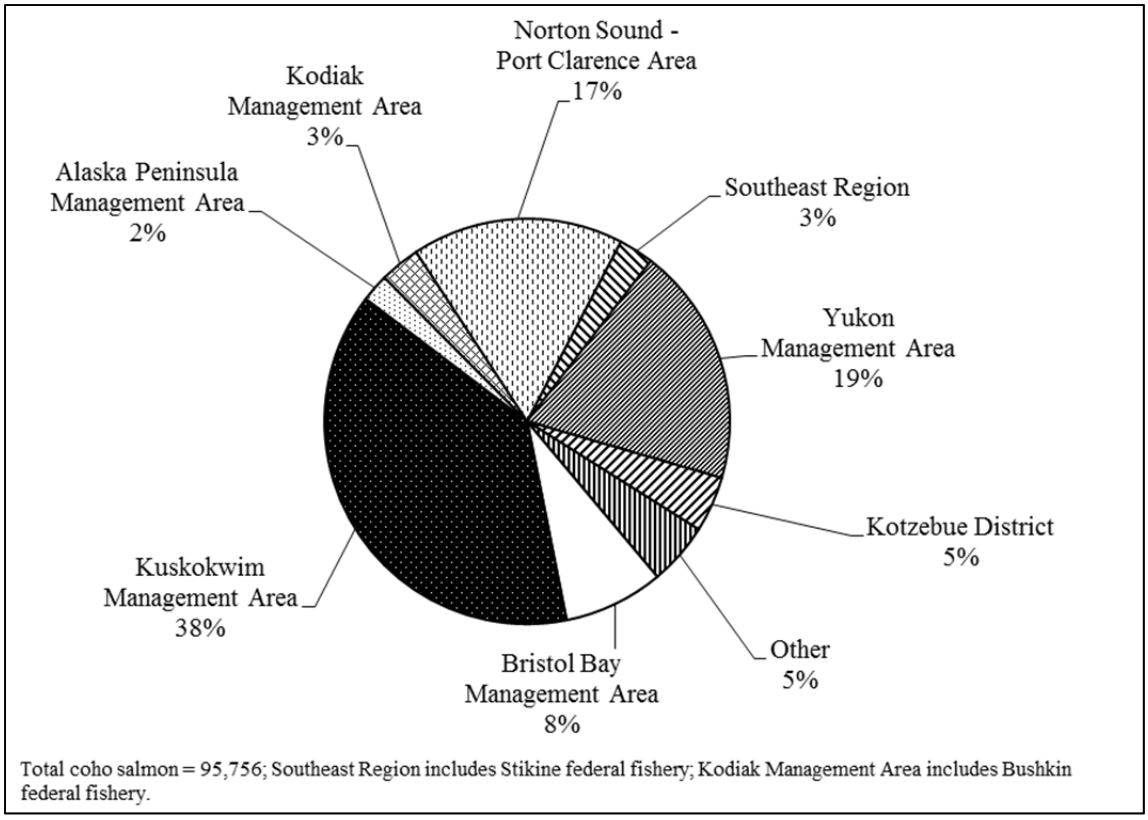
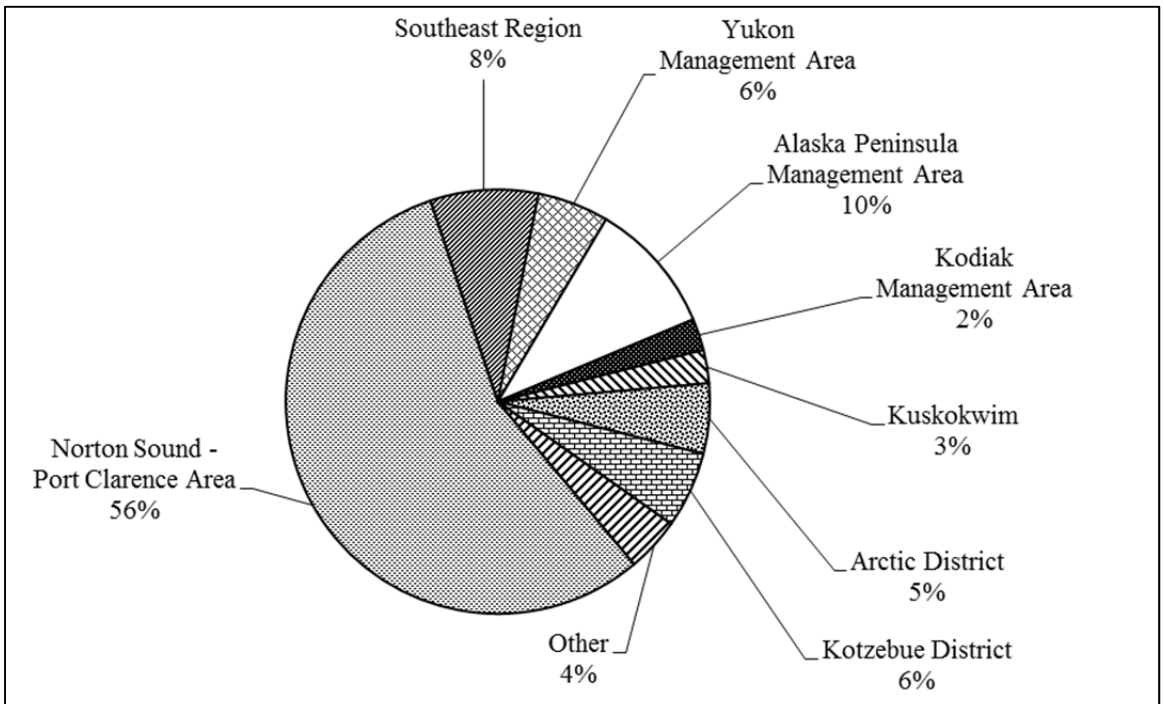


Figure 2-6.–Subsistence chum salmon harvest by area, 2015.



Total coho salmon = 95,756; Southeast Region includes Stikine federal fishery; Kodiak Management Area includes Bushkin federal fishery.

Figure 2-7.–Subsistence coho salmon harvest by area, 2015.



Total pink salmon = 43,512; Southeast Region includes Stikine federal fishery; Kodiak Management Area includes Bushkin federal fishery.

Figure 2-8.–Subsistence pink salmon harvest by area, 2015.

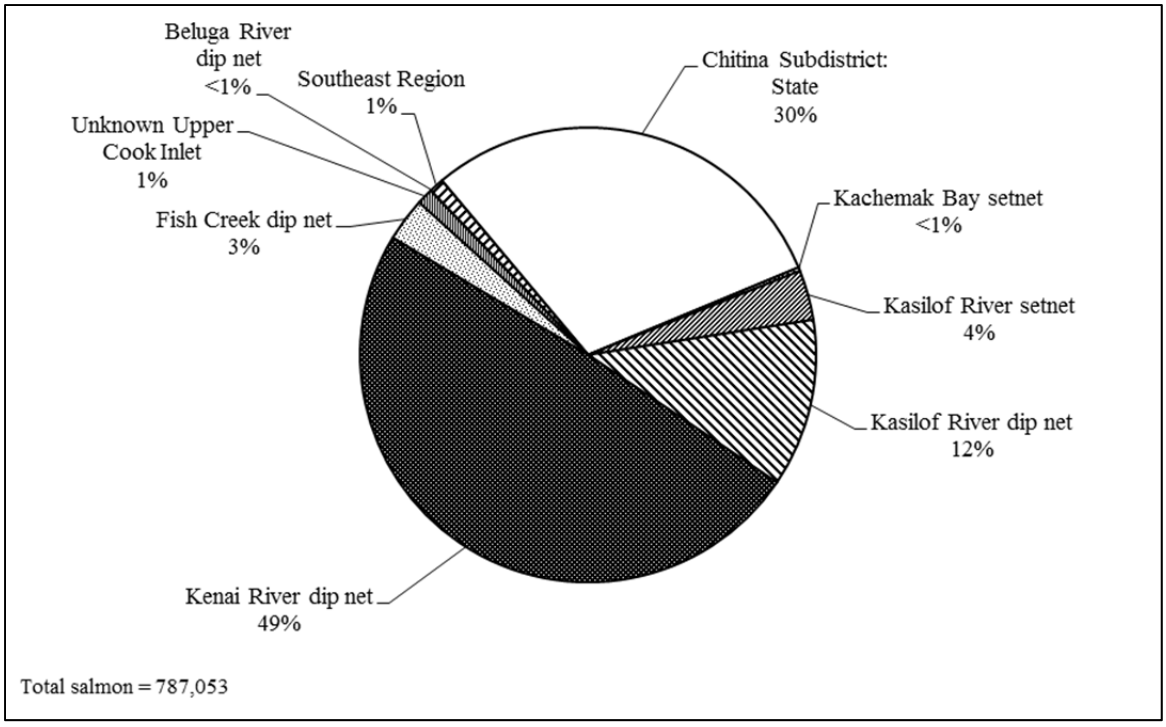


Figure 2-9.–Alaska personal use salmon harvest by fishery, 2015.

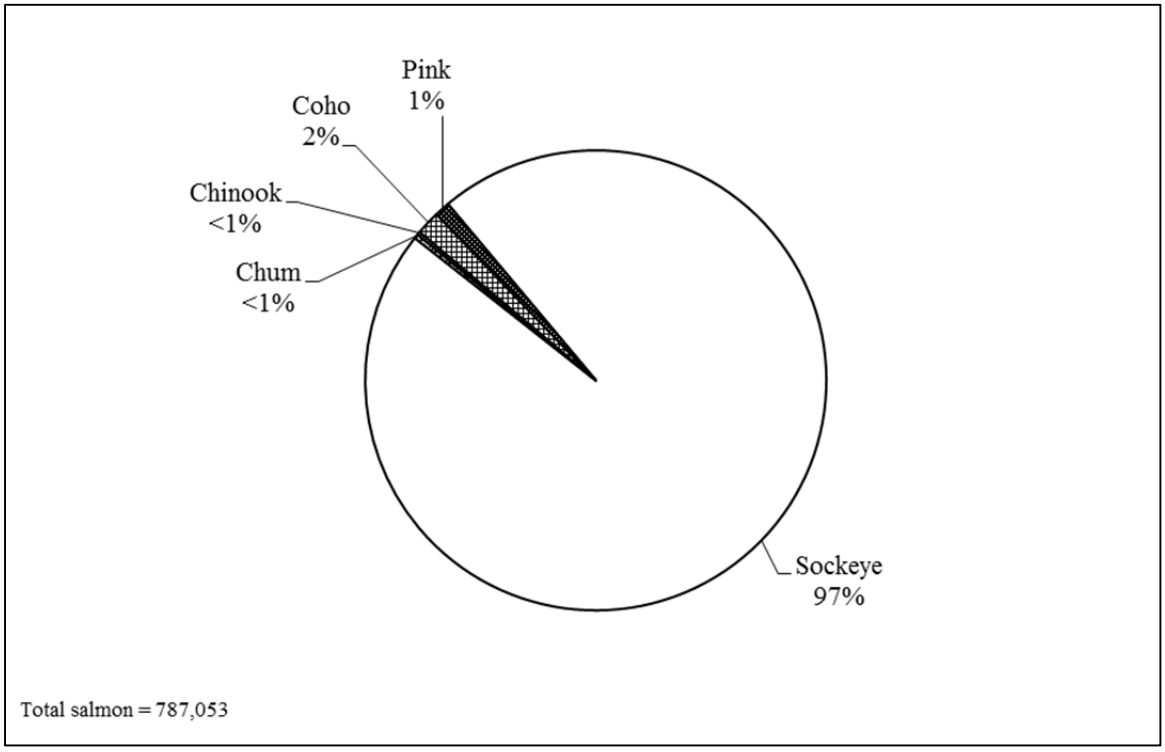


Figure 2-10.–Alaska personal use salmon harvest by species, 2015.

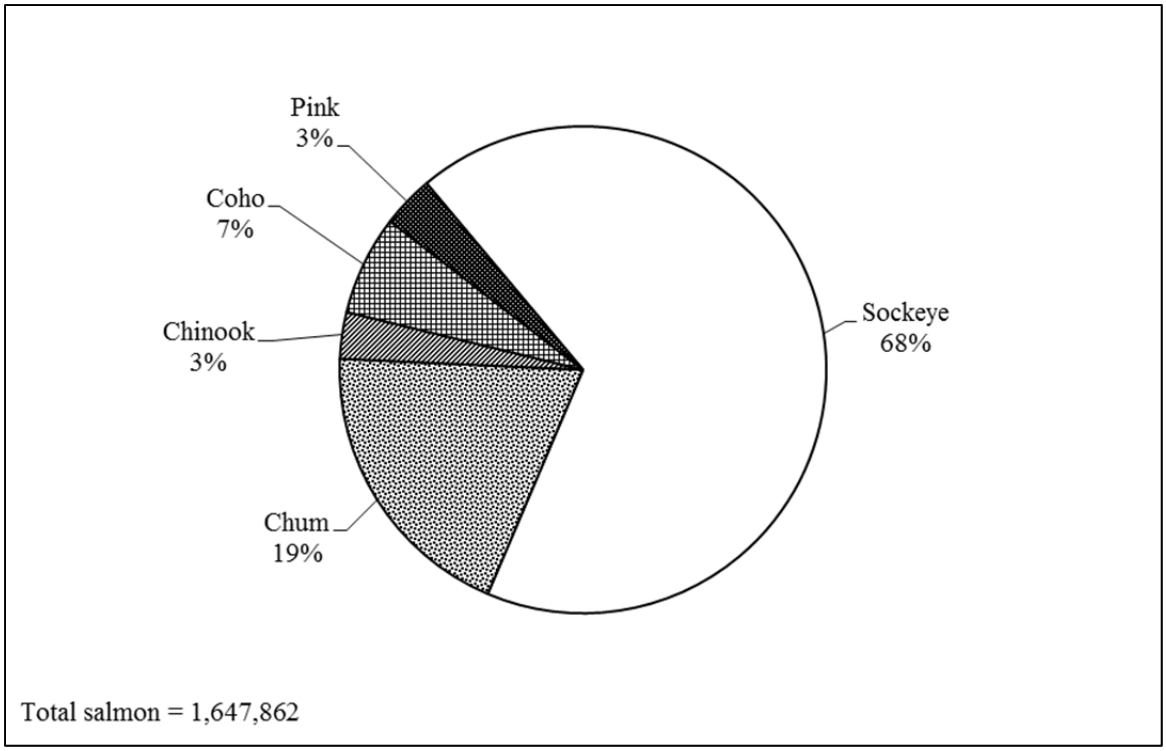


Figure 2-11.–Alaska subsistence and personal use salmon harvest by species, 2015.

CHAPTER 3: NORTON SOUND-PORT CLARENCE AREA AND ARCTIC-KOTZEBUE AREA

INTRODUCTION

In 2013, the former Northern District, which includes most of the North Slope Borough, was renamed the Arctic District. At the same time, management of the district was separated from the Yukon Area and combined with the former Kotzebue Area, renamed the Kotzebue District. The new fisheries management area is called the Arctic-Kotzebue Area. Previous statewide subsistence fisheries reports have not included information regarding subsistence fisheries in the Arctic District, although ongoing division research is filling this information gap. This chapter reflects these changes to the boundaries of subsistence fisheries management areas and districts. It has been expanded to include the results of recent subsistence research conducted in northwest Alaska and the North Slope, including subsistence fisheries harvest information to supplement the existing annual subsistence harvest monitoring program in Norton Sound.

NORTON SOUND–PORT CLARENCE AREA SALMON

Background

The archaeological record of the Norton Sound–Port Clarence region provides physical evidence of subsistence fishing dating back to the Arctic Small Tool/Norton Tradition, ca. 1500–1000 B.C.E. (Harritt 2010; Smith and Vreeman 1995). The area includes the regional center of Nome, with a 2015 population of 3,816, and 13 smaller communities ranging in size from 94 (Diomede) to 722 (Savoonga).[1] Overall, 70% of the residents of the Nome Census Area are Alaska Native, with an additional 10% reporting 2 or more racial backgrounds. More than 90% of the region's population outside of Nome is Alaska Native, with Inupiaq, Yupik, and Siberian Yupik peoples present. Most residents of the region continue to participate in a mixed subsistence-cash economy and depend on wild foods for cultural and nutritional sustenance. While more opportunities for wage work exist in Nome itself, subsistence activities are still an important facet of life to many of its inhabitants.

In summer, subsistence fishers harvest salmon with gillnets or seines in the main Seward Peninsula rivers and coastal marine waters. Beach seines are also used near the spawning grounds to harvest schooling or spawning salmon and other species of fish. A major portion of fish taken during the summer months is air dried or smoked for later consumption by residents. Chum and pink salmon are the most abundant salmon species districtwide; Chinook and coho salmon are present throughout the area but are more common in eastern and southern Norton Sound. Sockeye salmon are found in a few Seward Peninsula streams.

Regulations

The Port Clarence District includes all waters from Cape Douglas north to Cape Prince of Wales, including Salmon Lake and the Pilgrim River drainage. In most of the district, subsistence salmon fishing has few restrictions other than the general statewide provisions. Standard permit conditions include prohibition of fishing within 300 ft of a dam, fish ladder, weir, culvert, or other artificial obstruction. Salmon may be taken in most areas at any time, with no harvest limits. This area includes fishing areas used by residents of Teller, Brevig Mission, and Nome (the area is accessible via road from Nome) (Magdanz 1992:27). Since 2004, subsistence salmon permits have been required in all Port Clarence waters. In addition, in the Pilgrim River drainage, including Salmon Lake and the Kuzitrin drainage, harvests are limited, and specified areas are closed to subsistence salmon fishing. No fishing occurred in

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed May 2017. http://live.laborstats.alaska.gov/pop/estimates/data/TotalPopulationPlace.xls

Salmon Lake in 2009–2011 due to a crash of the sockeye population—managers had opened a portion of the lake to fishing for the previous 3 years. Prior to that, it had been closed since 1972.

The Norton Sound District encompasses all waters from Point Romanof north to Cape Douglas. It is divided into 6 subdistricts: 1) Nome, 2) Golovin, 3) Moses Point/Elim, 4) Norton Bay, 5) Shaktoolik, and 6) Unalakleet. In subdistricts 1 and 6, restrictions exist on gear, fishing periods, and areas open to fishing. In 2001, a regulatory change by the BOF made rod and reel a legal subsistence fishing gear type in the area from Cape Espenberg on northern Seward Peninsula to Bald Head, which is between Elim and Koyuk. This area includes subsistence fishing areas used by the residents of Nome, White Mountain, Golovin, Elim, Koyuk, Shaktoolik, and Unalakleet. Sport fishing bag and possession limits still apply, except when a subsistence salmon permit is required or fishing through the ice. In the former case, the harvest limits (if any exist) specified on the permit for each river apply. When fishers catch their limit in one drainage, they can fish in another. Subsistence fishing regulations are most restrictive in Subdistrict 1 (Nome) and Subdistrict 6 (Unalakleet), where the 2 largest communities in the area are located.

In Subdistrict 1 (Nome), subsistence harvests consist primarily of chum salmon and pink salmon. Chum salmon runs have been depressed since the mid-1980s, leading to increasing restrictions on all types of harvest. Upstream portions of most rivers are closed to protect spawning salmon, and harvests are limited in all subdistrict rivers. For 16 years, subsistence fishing was prosecuted primarily by emergency order, with openings much less frequent than in regulation. Fishing periods in marine waters were also limited.

From 1991–2005, the Nome Subdistrict was managed primarily by emergency order and was frequently closed to subsistence fishing for chum salmon each year on June 15 until ADF&G judged escapement goals were likely to be met. These closures, even when they were of short duration, impacted subsistence fishing because fishing often reopened during a wetter part of the summer, which made it difficult, if not impossible, to dry and process fish harvested for subsistence uses. From 1999 through 2005, chum salmon fishing in Subdistrict 1 was managed as Tier II, the only such fishery to exist in the state (5 AAC 01.182, 5 AAC 01.184).[2] In 1999, the chum salmon return was so poor that even Tier II fishing was closed; in 2000, only 10 permits were awarded (Soong et al. 2008:10). Chum salmon returns since then have gradually improved, allowing ADF&G to manage the fishery as Tier I between 2006 and 2014, and generally to observe the fishing schedule provided for by regulation.[3] In subdistricts 2 through 4, salmon may be taken at any time, with no harvest limits. However, restrictions exist on commercial fishers' participation in subsistence salmon fishing. Both the escapement and the commercial harvest of chum salmon experienced sharp declines starting in 1990 (Menard and Bergstrom 2006:2); however, the runs have been rebounding in recent years in the Norton Sound District (Menard et al. 2012). In Subdistrict 2 (communities of Golovin and White Mountain), both commercial and subsistence chum salmon harvests have dropped significantly since the 1990s; subsistence restrictions were in place in 2003. Chum salmon stocks in subdistricts 2 and 3 have been classified as stocks of "yield concern" since 2000, but chum salmon runs greatly improved in the late 2000s (Menard et al. 2012:8).

In subdistricts 5 and 6 (Shaktoolik and Unalakleet, respectively), continuing poor Chinook salmon runs have led to restrictions on commercial, sport, and subsistence fishing. The Shaktoolik and Unalakleet subdistricts are typically managed together because actions in one subdistrict are believed to affect the movement of fish in the other. Only 1 commercial Chinook salmon directed fishery has occurred since 2001. Restrictions were placed upon the subsistence and sport fisheries in 2003, 2004, and 2006–2015

2. A "Tier II" subsistence permit program is necessary when the number of participants in a subsistence fishery or hunt must be limited because the harvestable surplus of the fish stock or wildlife population is less than the lower bounds of the amount necessary to provide for subsistence uses. Individual Alaskans are distinguished from one another through the submission of Tier II applications, which are scored based on their history of uses of the particular resource and the ability to obtain alternative food; those with the highest scores receive Tier II permits, the others do not. Tier II provides a process that ensures that subsistence opportunities are provided to those most dependent upon the resource. Tier II implies that there is an insufficient harvestable surplus to provide for all subsistence uses (AS 16.05.258).
3. In a "Tier I" subsistence fishery, all interested Alaska residents may participate. Other fishers (commercial, sport, and personal use) are prohibited or restricted because the harvestable surplus is sufficient only to provide for customary and traditional subsistence uses (AS 16.05.258).

(Menard 2010; Menard et al. 2011, 2012, 2013; Menard, Soong, Kent, Harlan, and Brown 2015; Menard, Soong, Kent, Harlan, and Leon 2015; Menard et al. 2017). The Chinook salmon management plan adopted by the BOF in February 2007 (5 AAC 04.395) limits subsistence gillnet salmon fishing to two 48-hour fishing periods per week in marine waters from mid-June to mid-July. On the Unalakleet River, subsistence fishing is limited to two 36-hour fishing periods per week. Fishing time could be increased only if ADF&G were to project that the lower end of the sustainable escapement goal (SEG) range would be reached.

In 2007, the BOF changed the classification of Subdistrict 1 chum salmon from a "stock of management concern" to a "stock of yield concern." Subdistricts 2 and 3 chum salmon stocks, as well as subdistricts 5 and 6 Chinook salmon stocks, continued as "stocks of yield concern" (Soong et al. 2008:36).[4]

New state regulations governing customary trade of fish caught in the Norton Sound and Port Clarence areas became effective July 1, 2007. These regulations allowed cash sales, up to $200, of subsistence-caught finfish per household per year. Persons who wanted to participate had to obtain a customary trade record keeping form from Nome ADF&G. Sales could not be made to a fishery business nor the fish resold by the buyer. Sales could also occur only within the Norton Sound–Port Clarence Area (Soong et al. 2008:34). Effective April 13, 2013, the Alaska Board of Fisheries increased the annual limit for selling subsistence-taken finfish as customary trade from $200 per year to $500 total per household in a calendar year (5 AAC 01.188).

Subsistence Salmon Harvest Data Collection Methods

Two methods were used to assess subsistence salmon harvests in the Norton Sound and Port Clarence districts in 2015: (1) fishing permits in Subdistrict 1 (Nome), the Cape Woolley Area, Subdistrict 2 (Golovin), Subdistrict 3 (Moses Point/Elim), and the Port Clarence District (Brevig Mission and Teller); and (2) postseason household surveys conducted by the Division of Commercial Fisheries in 3 communities: Koyuk in the Norton Bay area (Subdistrict 4), Shaktoolik (Subdistrict 5), and Unalakleet (Subdistrict 6).

Norton Sound Subdistricts 1, 2, and 3: Subsistence Fishing Permits

Permits have been required for subsistence salmon fishing in Norton Sound Subdistrict 1 (Nome) since 1974. Beginning in 1999, Tier II chum salmon fishing permits were also issued to a limited number of Nome households with the intent that these households would have first priority over other subsistence fishers if only a small number of chum salmon were available for harvest. This priority would allow these households to fish earlier in the season, when weather conditions were more suitable for drying salmon. Tier I fishing permits were available to all other households when run strength was determined to be adequate. In 2015, chum salmon run abundance was projected to achieve the biological escapement goal for the subdistrict and provide amounts reasonably necessary for subsistence. Because of this, a Tier II fishery was not implemented (Menard et al. 2017). The Nome ADF&G office issued a record setting 529 subsistence (Tier I) salmon permits, all of which were returned[5]. This was an increase from the 490 permits issued in 2014, and greater than the previous record of 494 permits issued during the 2010 fishing

4. The Policy for Management of Sustainable Salmon Fisheries (SSFP; 5 AAC 39.222) defines three levels of concern for salmon stocks based on status reports and recommendations from ADF&G. A stock of Yield Concern is defined as "a concern arising from a chronic inability, despite the use of specific management measures, to maintain specific yields, or harvestable surpluses, above a stock's escapement needs; a Yield Concern is less severe than a Management Concern" (5 AAC 39.222(f)(42)). A stock of Management Concern is defined as "a concern arising from a chronic inability, despite the use of specific management measures, to maintain escapements for a salmon stock within the bounds of the SEG, BEG, OEG, or other specified management objectives for the fishery; a Management Concern is not as severe as a Conservation Concern." (5 AAC 39.222(f)(21)). A stock of Conservation Concern is defined as "a concern arising from a chronic inability, despite the use of specific management measures, to maintain escapements for a stock above a sustained escapement threshold (SET); a Conservation Concern is more severe than a Management Concern." (5 AAC 39.222(f)(6)).
5. The number of Tier I salmon permits cited in Table 3-1 for the Nome Subdistrict (529) is slightly different than the number reported by (Menard et al. 2017:531). This is due to a difference in reporting of the data—this report breaks down harvests by location of the permit holder instead of permits within the subdistrict (for example if a fisher from the Golovin subdistrict receives a permit to fish in Nome, their permit will be counted in the Golovin district total).

season (Menard, Soong, Kent, Harlan, and Leon 2015; Menard et al. 2017) (Table 3-1). A total of 314 households fished their permits, with the largest number of permits fished on the Nome River (172) and Snake River (63) (harvests largely came from those rivers, the Bonanza River, the Solomon River, and marine waters) (Menard et al. 2017).

Since 1998, the Nome permit data have not been expanded to account for households whose permits were not returned. This contrasts with earlier years when permit data were expanded by drainage, with expansion factors based upon the fraction of unreturned permits for that drainage. ADF&G staff believed that expansion of the permit data led to an overestimation of the salmon harvest because the unreturned permits were most likely from households that did not fish.

Subsistence fishing permits were also issued for the Cape Woolley Area, a traditional camp and fishing area for King Island households, who, although they settled in Nome more than 40 years ago, maintain a distinct community identity. Located in the Norton Sound District west of Nome, this area lies outside Subdistrict 1 but within the boundaries of the area for which fishing permits are required (Rocky Point to Cape Douglas). In 2015, 15 permits were issued for the Cape Woolley Area; all were returned to ADF&G (Table 3-1). Of those, 2 households fished their permits (Menard et al. 2017).

Subsistence permits have been required for salmon fishing in Subdistrict 2 (Golovin) and Subdistrict 3 (Moses Point/Elim) since 2004, when 199 permits were issued (the highest number yet). In 2015, 187 permits were issued for Subdistrict 2. All permits were returned (Table 3-1); 101 households reported fishing (Menard et al. 2017). The number of Subdistrict 2 permits issued to Nome residents has dropped since 2004, and fishery managers have attributed the decline to the easing of fishing restrictions in the Nome Subdistrict and rising fuel costs (Menard et al. 2010). The number of permits issued to residents of White Mountain and Golovin has held steady. In 2015, ADF&G issued 59 permits for Subdistrict 3; the number of issued permits has ranged from 60 (2011) to 66 (2014) in recent years. All permits were returned and 40 households reported fishing, a slight decrease from the 53 in 2014 (Menard et al. 2013; Menard, Soong, Kent, Harlan, and Brown 2015; Menard, Soong, Kent, Harlan, and Leon 2015; Menard et al. 2017) (Table 3-1).

Port Clarence District: Salmon Lake and Pilgrim River Subsistence Fishing Permits

Permits have been required to fish the Pilgrim River since 1974 (Magdanz 1992:27). This requirement was expanded to all Port Clarence waters in 2004. In 2015, 549 Port Clarence and Pilgrim River permits were issued, above the 429 issued in 2014 and the former record of 431 issued in 2013 (tables 3-2 and 3-3). Of the permits issued in 2015, 377 were to fish the Pilgrim River only, much more than the former record of 265 in 2013 (all were returned with 291 having been fished). One permit was issued for Salmon Lake and 171 were issued for other waters in the district (all were returned with 92 having been fished) (Menard et al. 2017:69). The number of permits for the Pilgrim River grew substantially between 2003 and 2008, likely in response to several consecutive years of record sockeye salmon runs. The decline in permits issued from 2009 to 2012 may, in turn, be a response to a poor run in 2008 followed by the crash in 2009, when only 953 salmon were counted passing through the weir. Poor runs continued in 2010, with a count of 1,654 salmon. There was improvement to the sockeye run in 2011 (8,449 sockeye salmon passed through the weir) and 2012 (7,085) (Menard et al. 2012; Menard, Soong, Kent, Harlan, and Brown 2015). The 2013 sockeye run, with 12,428 salmon passing through the weir, was unusually high—followed by a lower but robust escapement of 9,719 in 2014 (Menard, Soong, Kent, Harlan, and Leon 2015). The 2015 escapement was the highest since the record runs of the mid-2000s, with 9,257 sockeye salmon counted at the Glacial Lake weir and 36,052 counted at the Pilgrim River weir (Menard et al. 2017:50).

In 2007, the BOF adopted regulations that closed the southwestern half of Salmon Lake and allowed for fishing on the northeastern half by emergency order. Very little salmon fishing has been allowed in recent years in Salmon Lake due to the crash of the sockeye salmon run in 2009 and poor runs in 2010–12 (Menard et al. 2013). In 2013, limited fishing in Salmon Lake occurred for the first and only time since

2008, with no such permits issued in 2014 (Menard, Soong, Kent, Harlan, and Brown 2015; Menard, Soong, Kent, Harlan, and Leon 2015). In 2015, one permit was issued for Salmon Lake, which was not fished (Menard et al. 2017).

Household Surveys

In 2015, ADF&G Division of Commercial Fisheries conducted annual subsistence fisheries household surveys in Koyuk, Shaktoolik, St. Michael, Stebbins, and Unalakleet. Researchers attempted to contact all of the households in each of the surveyed communities. Actual sample rates varied: 220 of 260 Unalakleet households (85%) were contacted, as were 60 of 67 Shaktoolik households (90%), 75 of 79 Koyuk households (95%), 98 of 132 Stebbins households (74%), and 89 of 93 St Michael households (96%). The salmon survey data were expanded by community to account for the households not contacted (Table 3-4).

The goals of the postseason household survey were to:

- collect harvest data that would result in a total harvest estimate for subsistence salmon by species and by community;
- compile information on harvest by gear types, participation rates, household size, use of salmon for dog food, and participation in customary barter and trade; and
- assess the quality of chum salmon fishing and what affected it.

Subsistence Salmon Harvests in 2015

Norton Sound District Subsistence Salmon Harvest

The estimated 2015 subsistence harvest of salmon by communities in the Norton Sound District was 65,712 fish, less than the 2014 harvest of 84,210 fish (tables 3-1, 3-2). The 2015 harvest was the largest odd-year harvest since 2005but lower than the average of odd-number years 1993–2013 (70,356). Pink salmon abundance commonly follows an even–odd year cycle. Their abundance in Norton Sound is usually significantly higher in even-numbered years (2004, 2006, 2008, etc.) with districtwide harvests usually reflecting this difference. In 2015, the total Norton Sound pink salmon subsistence harvest (24,167 fish) was the second highest odd year since 2005 but lower than the odd-year average of 30,339 pink salmon. Chum salmon harvests (21,538) were higher than the historical average of 18,400 from 1994—2014, and only slightly less than the 2014 harvest of 23,802. Coho harvests (15,628) were lower than the 1994–2014 average harvest of 16,035 coho salmon.

Total Norton Sound subsistence catches of 3 out of the 5 salmon species were lower in 2015 than 2014. Fishers caught fewer coho, pink, and chum salmon, although Chinook and sockeye salmon harvests showed modest increases (Table 3-2). Overall the estimated 2015 subsistence salmon harvest was higher than the average for odd years from 2001 to 2013 (63,928 fish), but lower than harvests in the 1990s. Between 1994 and 2015, odd-year harvests of all salmon have ranged from a low of 43,883 in 2011, to a high of 113,612 in 1995, with a 1995–2013 average of 70,356 salmon. Even-year harvests have ranged from the low in 2010 of 67,149 to a high of 134,050 in 1996, with an average of 92,632 salmon.

Chum salmon abundance in 2015 was expected to provide for both subsistence and commercial harvests, and for the third consecutive year after a 20-year hiatus, commercial fishing for chum salmon occurred in the Nome Subdistrict. The commercial chum salmon harvest in Norton Sound was the best in over 30 years, and the fifth year out of 6 that the harvest exceeded 100,000 fish. Almost 60% of the commercial chum harvest was taken in the southern Norton Sound 4–6 subdistricts. In 2015, chum salmon escapement in Subdistrict 1 was slightly less than 2014, but escapement in 2013 and 2014 were the largest seen in over 20 years. Total coho escapement was most likely achieved, although no aerial surveys were flown for North River and Kwiniuk Rivers; fish tower counts for both rivers were strong, and the

run was well above average. Commercial coho harvests were record breaking in 2015 (Menard et al. 2017).

Although stronger, Chinook salmon runs were still weak throughout Norton Sound in 2015, which required inseason restrictions. The record low 15 Chinook salmon counted at the Kwiniuk River tower in 2013 improved to 429 Chinook salmon in 2014 and 318 in 2015, falling within the SEG range of 300–550 fish. The final escapement at the Unalakleet River weir was 2,789 Chinook salmon (the highest count in the 6-year project history). The subsistence harvest for Chinook salmon in Subdistrict 6 was 961 fish, higher than the previous 4 years. However, like 2014, there was a full closure of coastal southern Norton Sound subsistence salmon fisheries for the month of June, with the exception of 1 emergency order opening for small mesh nets described below. This may have impacted Subdistrict 5 Chinook salmon harvests, which were the lowest on record since 1994 (168 fish) (Menard et al. 2017).

Subdistrict 1 Harvest

Regulation changes were made at the 2013 Alaska Board of Fisheries meeting, which allowed for subsistence gillnet fishing 7 days a week in marine waters in the eastern half of Subdistrict 1, and beach seining was allowed in all subsistence areas during the chum salmon run when gillnet fishing was open in 2015. The Board also passed regulations allowing for a commercial chum salmon fishery in the Subdistrict based on conservative management guidelines. For the tenth year in a row, Subdistrict 1 opened on June 15 for subsistence salmon fishing as per regulation. The chum salmon fishing schedule in marine waters west of Cape Nome (72 hours in marine waters and two 48-hour fishing periods in fresh waters per week) was observed from mid-June to mid-July. By late June and early July, excellent marine subsistence catches of chum salmon were reported, and aerial surveys in mid-July of the eastern Nome Subdistrict drainages of the Flambeau and Bonzanza rivers and the western drainage of the Sinuk River observed several thousand chum salmon. The Eldorado River, Nome River, and Snake River weir counts exceeded the chum escapement goal ranges in 2015. Because of this, subsistence gillnet fishing continued on the standard freshwater schedule, and an additional 48 hours were added to the marine schedule for western Subdistrict 1, as in 2014. Overall, the chum salmon subsistence harvest was the second highest since 1990, only slightly less than the record in 2014. While no coho salmon escapement goals have been established for Subdistrict 1, escapement in the Nome and Snake rivers was in the midrange compared to 10 previous years of sufficient escapement estimates (Menard et al. 2017). The estimated 2015 subsistence salmon harvest in the Nome Subdistrict was 3,967 chum salmon, 3,180 pink salmon, 1,790 coho salmon, 1,081 sockeye salmon, and 21 Chinook salmon (Table 3-1).

Subdistrict 2 and 3 Harvest

No subsistence catch limits are in place in subdistricts 2 and 3. Most salmon harvested there are caught by residents of the communities of White Mountain, Golovin, and Elim. Pink salmon composed the greatest percentage of the harvest (56% of fish in Subdistrict 2 and 37% in Subdistrict 3). Chum and coho salmon made up most of the rest, with some Chinook and a few sockeye salmon. In 2015, a total of 8,002 salmon were harvested in Subdistrict 2 (Golovin) (Table 3-1). This was the fifth lowest harvest year in the 2000s, largely due to the low harvest of pink salmon in the district (Menard et al. 2017). Pink salmon composed 56% of the number of salmon harvested, with 28% chum, 14% coho, 2% Chinook, and 1% sockeye salmon making up the rest of the harvest. In 2015, low water enabled the tower counters on the Fish River to more accurately count chum salmon abundance. The Niukluk River counting tower was used to evaluate escapement in the Golovin Subdistrict from 1995–2012, but the project was eliminated in 2013; the Niukluk River is a tributary of the Fish River, a major salmon producing waterway in the area. In 16 of the 18 years that both were operational, the Niukluk and Kwiniuk counting towers tracked together on escapement achievement. Large numbers of chum salmon at the Kwiniuk River tower in 2015 indicated that the escapement goal range there would easily be exceeded, and ADF&G expected that this would also be the case in the Fish River drainage (Menard et al. 2017). In late June, managers opened directed commercial fishing of chum salmon for one 48 hour period, which was increased to two 48 hour periods

per week in July. In August, ADF&G switched to coho management, allowing two 48-hour fishing periods per week for the remainder of the season. The 2015 coho salmon harvest was the fifth highest on record, and the Fish River tower count of over 14,000 coho salmon indicated good escapement. (Menard et al. 2017).

Based upon subsistence fishing permits, residents of Golovin harvested an estimated 3,581 salmon in 2015, the majority of which were pink salmon (2,750 fish, 77%; Table 3-4). Chum and coho salmon harvests (405 fish, 12%, and 309 fish, 9%, respectively) filled out the bulk of the remainder. Chinook salmon (64) contributed 2%, and sockeye salmon harvests (53) contributed 1% to the total Golovin salmon harvest. White Mountain residents harvested an estimated 3,207 salmon, 1,326 (41%) of which were pink salmon. The remainder of the harvest was chum salmon (1,311) at 40%, and coho salmon (512) at 16%, Chinook salmon (42) at 1%, and sockeye salmon (16) at less than 1%.

In Subdistrict 3 (Moses Point/Elim), early projections of the chum salmon escapement by the Kwiniuk River tower counts indicated that escapement goals would be met. On June 25, a 48-hour chum period was opened, and a second 48-hour chum salmon fishing was reduced to a 24-hour opening in order to reduce the incidental catch of Chinook salmon. By July 7, escapement at the Kwiniuk River tower enabled managers to open two 48 hour periods for chum salmon per week until the end of the season. (Menard et al. 2017). Subsistence fishers harvested an estimated 4,911 salmon, 37% of the fish were pink salmon, 32% chum salmon, 24% coho salmon, 4% Chinook salmon, and 3% sockeye salmon (Table 3-1). Despite the above average run in 2015, the number of salmon harvested in the Elim subdistrict was 40% less than 5-year and 10 year averages. Some fishers reported being active in commercial fishing and too busy to engage in subsistence fishing.

Subdistrict 4 Harvest

Fishers caught an estimated 6,312 salmon for subsistence in the Norton Bay subdistrict (Table 3-1). Most of the harvest was made up of chum and pink salmon (55% and 25%, respectively). Of the remainder, 15% were coho salmon, 4% were Chinook salmon, and 1% sockeye salmon (Table 3-1). By comparison, in 2014, an estimated 8,316 salmon were harvested in the subdistrict, 28% of which were pink salmon and 55% chum. Coho salmon made up 15% of that year's subsistence salmon harvest, another 2% were Chinook salmon, and there was one reported sockeye salmon harvested (Menard et al. 2017).

In 2015, the eighth consecutive annual subsistence salmon survey was conducted in Koyuk by the Division of Commercial Fisheries. Table 3-4 presents harvests at the community level. Because of additional harvests in other subdistricts, Koyuk households caught slightly more salmon than the total harvest for the Norton Bay subdistrict. Households harvested an estimated 6,343 salmon, the majority of which were chum salmon (55%) and pink salmon (25%). Households caught lesser amounts of coho (15%), chinook (4%), and sockeye (1%) salmon (Table 3-4).

Subdistrict 5 and 6 Harvests

Preseason forecasts by ADF&G called for another weak Chinook salmon run to subdistricts 5 and 6. Restrictions were put in place in 2014 on subsistence fishing per the management plan (5 AAC 04.395) that included an unprecedented pre-season closure to all marine and freshwater subsistence salmon fishing from north of Wood Point near St. Michael, to Bald Head near Elim. In 2015, the season also began with closure early in the season (June 8), and there were 3 openings of 24 or 30 hours by emergency order, and with net mesh size restricted to 6″ or less. Subsistence fishing time was increased to 2 openings of 24 hours and 48 hours with the same mesh restrictions the first week in July. On July 9, subsistence fishing was expanded to 7 days a week in marine waters. The Alaska Board of Fisheries had also passed new regulations in 2013, limiting the size of seining nets to a mesh size of 4.5″ or less and prohibiting the retention of any Chinook salmon caught with a with beach seine. Periodically throughout July, subsistence beach seining in fresh waters was opened through emergency order.

Commercial fishing in both subdistricts was opened for chum salmon on July 1 with two 24-hour fishing periods the first week, and one 48 and one 72-hour opening the second week. In mid-July, chum salmon commercial openers were scheduled for two 48-hour periods a week. In August, the coho salmon commercial fishing schedule was the same, with the exception of one 24-hour extension to a fishing period in both subdistricts in mid-August due to the strong coho salmon run. In September, there was one 96-hour opening. Overall, the chum runs in Subdistricts 5 and 6 were above average, and commercial harvests ranked third highest in Subdistrict 5 and the second highest on record for Subdistrict 6 in the last 23 years. The strength of the coho salmon run in both subdistricts allowed for commercial fishing and no subsistence restrictions. Subdistrict 5 coho salmon harvest was the fourth highest on record, while Unalakleet had a record coho salmon commercial harvest (101,659 fish) (Menard et al. 2017).

In subdistrict 5 (Shaktoolik), subsistence fishers caught an estimated 7,916 salmon in 2015, over half of which (4,975 or 63%) were pink salmon. Coho salmon (2,080) composed 26% of the total harvest. The rest of the harvest was composed of chum salmon (482) and sockeye salmon (211), which provided 6% and 3% of the total, respectively. About 2% of the harvest consisted of Chinook salmon (Table 3-1).

In subdistrict 6 (Unalakleet), subsistence fishers caught an estimated 16,087 salmon, 45% (7,544) of which were pink salmon. Coho salmon (5,673) made up 34% of the annual harvest, followed by chum salmon (2,381 or 14%), and Chinook salmon (961 or 6%). One percent of the total harvest was sockeye salmon (Table 3-1)[6].

Table 3-4presents harvests at the community level. Because residents of Shaktoolik and Unalakleet sometimes fish outside of their subdistrict, the community harvests are occasionally slightly different than the total harvest for the individual subdistricts. Households in Shaktoolik and Unalakleet harvested the same number of salmon as is reported at the Subdistrict level in 2015.

Stebbins and St. Michael

Household surveys have been conducted sporadically in Stebbins and St. Michael since 1994, most recently in 2012, 2014, and 2015. Both of these communities lie outside the boundaries of the Norton Sound commercial fishing subdistrict designations, but are within the Norton Sound-Port Clarence Fisheries Management Area. In 2015, Stebbins residents harvested 5,582 salmon, the majority of which were chum salmon (2,798 fish, 50%) and coho salmon (2,122 fish, 38%). The remaining harvest was composed by pink salmon at 6%, Chinook salmon at 5%, and sockeye salmon at >1% of the total harvest (Table 3-1). This was slightly lower than the 8,068 salmon harvested by Stebbins residents in 2014.

In 2015, St. Michael residents harvested 6,141 salmon, the majority of which were chum salmon (4,634 fish, 75% of the harvest). Coho salmon (762 fish) composed 12% of the harvest, Chinook salmon (475) composed 8%, pink salmon (237) composed 4%, and sockeye salmon (33) composed >1% (Table 3-1). This was higher than the 2014 harvest of 3,825 salmon.

Norton Sound Harvest Overall

Of the estimated total 2015 subsistence salmon harvest in Norton Sound, 3% were sockeye salmon, 4% were Chinook salmon, 24% were coho salmon, 32% were chum salmon, and 37% were pink salmon (Figure 3-1). Total harvest estimates for the Norton Sound District for 1994–2015 are presented in Table 3-3. Methods changed in 2004 when permits replaced surveys in Norton Sound Subdistrict 2 (Golovin and White Mountain) and Norton Sound Subdistrict 3 (Moses Point/Elim). Very little of the documented 2015 subsistence salmon harvest was taken by residents from outside the district. Thirty-six subsistence

6. Harvest numbers vary slightly in Subdistrict 5 and 6 between this report and Menard et al. (2015). In the management report, Subdistrict 5 subsistence harvest numbers are presented as 149 Chinook salmon, 0 sockeye salmon, 1116 coho salmon, 3696 chum salmon, 883 pink salmon (total of 5,844 salmon) and Subdistrict 6 subsistence harvest numbers are presented as 345 Chinook salmon, 114 sockeye salmon, 5,642 coho salmon, 9,914 pink salmon, and 2,712 chum salmon (total of 18,727 salmon). The difference between these harvest numbers is due to expansion methods.

permits were issued to residents of Anchorage, Fairbanks, Barrow, Eagle River, Homer, Palmer, and Wasilla; their combined total salmon harvest was 546 salmon (Table 3-4).

Port Clarence District Subsistence Salmon Harvest

The estimated 2015 subsistence harvest of salmon in the Port Clarence District was 21,699 fish (tables 3-2 and 3-3). This harvest, greater than the 2014 harvest, was the highest on record and greater than the 10-year average (2005–2014) of 14,299 fish. Of the total salmon harvest, less than 1% was Chinook salmon, 3% was coho salmon, 14% was pink salmon, 19% was chum salmon, and 64% was sockeye salmon (Figure 3-2).

ARCTIC-KOTZEBUE AREA SALMON

Introduction

As noted above, beginning in 2013, the management areas and districts of the Arctic, Yukon, and Kuskokwim watersheds were reorganized. In particular, the North Slope, formerly called the "Northern District" and combined with the Yukon River drainage was renamed the "Arctic District" and combined with the former Kotzebue Area to compose the Arctic-Kotzebue Area. The former Kotzebue Area became the Kotzebue District. Previous annual reports have not addressed subsistence fisheries information from the Arctic District, as there have been no annual harvest monitoring programs conducted by ADF&G. Ongoing Division of Subsistence research will continue to expand available information on subsistence fisheries by residents of North Slope Borough communities. Some research results from the North Slope Borough Department of Wildlife Management are also summarized below to better document the extent of subsistence fisheries on the North Slope.

In addition to salmon, major subsistence fisheries take place in the Arctic-Kotzebue Management Area for sheefish, other whitefishes, and Dolly Varden (known locally as "trout"). Where salmon are less abundant, these nonsalmon fish are more prevalent in local diets. Regarding nonsalmon fish harvests, ADF&G has conducted far more extensive research in the Kotzebue District compared with Arctic District and has a substantial data set for 2014 (discussed in Fall et al. 2017:37–38).

Background

Kotzebue District

Kotzebue Sound residents have relied on fish for cultural and nutritional sustenance for thousands of years. Most residents in the region continue to participate in a mixed subsistence-cash economy, harvesting a wide variety of wild foods. The Kotzebue District includes the subsistence fishing areas used by Point Hope, Kivalina, Noatak, Kotzebue, Kiana, Noorvik, Selawik, Ambler, Shungnak, Kobuk, Buckland, Deering, Shishmaref, and Wales. The role of salmon in the wild food diet varies from community to community, and is affected primarily by salmon abundance. Communities that harvest few salmon typically harvest large numbers of nonsalmon fish, such as sheefish *Stenodus leucichthys*, other whitefishes *Prosopium* and *Coregonus* spp., and Dolly Varden *Salvelinius malma.* Along the Noatak and Kobuk rivers, where runs of chum salmon are strong, many households' activities in mid- and late summer revolve around the harvesting, drying, and storing of salmon for use during the winter. Chum salmon predominate in the district, composing approximately 90% of the subsistence salmon harvest. Small numbers of other salmon species are present in the district. ADF&G Division of Subsistence recently completed a subsistence fisheries research project in the Kotzebue Sound region (OSM Project No. 12-153, Northwest Alaska Key Subsistence Fisheries Harvest Monitoring Program). This research resulted in subsistence fish harvest estimates for 2012–2014, discussed in previous annual reports and summarized below.

Arctic District

Residents of the North Slope have relied on fish for cultural and nutritional sustenance for generations. The only systematic subsistence fisheries harvest monitoring program has been conducted by the North Slope Borough's (NSB) Department of Wildlife Management (Bacon et al. rev2011). The most recent report by NSB described subsistence fish harvests in the region from 1994–2003; this includes harvest amounts, harvest timing, locations, gear and other qualitative information (Bacon et al. rev2011). Most residents in the region continue to participate in a mixed subsistence-cash economy, harvesting a wide variety of wild foods. The Arctic District includes the subsistence fishing areas used by Anaktuvuk Pass, Atqasuk, Barrow, Kaktovik, Nuiqsut, Point Hope,[7] Point Lay, and Wainwright. The role of salmon and nonsalmon in the wild food diet varies from community to community and is affected primarily by resource availability. Chum and pink salmon are present in the greatest abundance, although sockeye, coho, and Chinook salmon are occasionally caught. Residents often refer to ocean bright salmon as "silvers" leading to the misidentification of chum harvests as coho salmon in some cases. Nonsalmon species important to subsistence include Arctic grayling, Dolly Varden, lake trout, burbot, rainbow smelt, various whitefishes, Arctic cod, and saffron cod. ADF&G Division of Subsistence conducted a subsistence fisheries research project along the western coast of the North Slope [Office of Subsistence Management (OSM) Project No. 12-154, North Slope Emerging Salmon Fisheries], focusing on subsistence fishing harvest and use patterns by residents of Point Lay and Wainwright (2012–2014). The findings were discussed in previous annual reports, and are summarized below.

Regulations

In the Arctic-Kotzebue Area, subsistence salmon fishing has few restrictions, other than the general statewide provisions (e.g., 5 AAC 01.010) and specifications regarding lawful subsistence gear and gear specifications (5 AAC 01.120). Standard conditions include prohibition of fishing within 300 ft of a dam, fish ladder, weir, culvert, or other artificial obstruction. Salmon may be taken in the Arctic-Kotzebue Area at any time with no harvest limits and no required permits, except that during commercial fishing closures in the Kotzebue District, commercial fishers may not fish for subsistence purposes (5AAC 01.110). Salmon may be taken only by gillnets, beach seines, or, in the Kotzebue District, by hook and line attached to a rod or pole, but only in the state waters of, and all flowing waters that drain into the Chukchi Sea or Kotzebue Sound from Cape Espenberg to Cape Prince of Wales (5 AAC 01.120(f)).

Fish other than salmon may be taken by set gillnet, drift gillnet, beach seine, fish wheel, pot, longline, fyke net, dip net, jigging gear, spear, and lead, or, as specified in 5 AAC 01.120(f), by hook and line attached to a rod or pole. In the Kotzebue District, gillnets used to take sheefish may not be more than 50 fathoms in aggregate length nor 12 meshes in depth, nor have a mesh size larger than seven inches (5 AAC 01.120(e)).

Other regulatory restrictions associated with subsistence fishing in the Arctic-Kotzebue Area include the provision that a gillnet may not obstruct more than one-half the width of any fish stream and any channel or side channel of a fish stream. Furthermore, a stationary fishing device may not obstruct more than one-half the width of any salmon stream and any channel or side channel of a salmon stream (5 AAC 01.120(c)). Except when fishing through the ice or when a subsistence fishing permit is required, use of a hook and line attached to a rod or pole between Cape Espenberg and Cape Prince of Wales requires subsistence fishers to follow the methods and means specified in sport fishing regulations 5 AAC 70.011 and 5 AAC 70.030, and the bag and possession limits, by species, detailed in 5 AAC 70.011.

7. Point Hope lies within the Kotzebue District but is near the boundary of the Arctic and Kotzebue districts, and harvests fish in both districts. Available harvest data cannot be separated by district fished. Therefore, all harvest estimates for Point Hope in this report are included in the Kotzebue District.

Subsistence Salmon (and nonsalmon) Harvest Data Collection Methods

From 1994 through 2004, with funding from the Division of Commercial Fisheries, the Division of Subsistence conducted annual household surveys in selected Kotzebue District communities to collect subsistence salmon harvest data (Fall et al. 2007:23–38). Because funding for that effort has not been available since 2004, no annual surveys have been conducted; therefore, subsistence salmon harvest estimates since then are available for only for communities participating in special projects, which also collected data about nonsalmon fish harvests.[8] Harvest data from these projects are presented in tables 3-5–3-6, and are discussed in the 2014 annual report (Fall et al. 2017:37–38). Kotzebue District data for 2014 were more complete than for any year since 2004, missing only 3 communities: Deering, Shishmaref, and Wales. Table 3-7 shows, by year for 1994–2004, which communities were included in the annual harvest assessment program, and since 2004, in which communities comprehensive or fisheries-specific harvest surveys were conducted.

Very little fisheries information has been collected by ADF&G in the Arctic District. In Point Lay, a comprehensive survey of 2012 (Braem et al. 2017) was followed by fish harvest surveys for 2013 and 2014 (Mikow et al. 2016). In Wainwright, fish harvest data was collected for 2012, 2013, and 2014 (Mikow et al. 2016). Additionally, comprehensive harvest surveys for 2014 were conducted in the Arctic District communities of Anaktuvuk Pass, Barrow, and Nuiqsut (Brown et al. 2016). Results from these projects were discussed in the 2014 annual report (Fall et al. 2017:38–39).[9]

Arctic-Kotzebue Area Subsistence Salmon Harvest Estimates

Kotzebue District

As noted above, the Division of Subsistence conducted annual salmon harvest surveys in selected Kotzebue District communities from 1994 through 2004. The average yearly subsistence harvest for the regularly surveyed communities between 1994 and 2004 was 59,650 salmon, the majority of which were chum salmon (Fall et al. 2017:36). This average was certainly low due to incomplete datasets for several years during that period; no year included all Kotzebue District communities. Harvest estimates for 1994, 2002, 2003, and 2004 summarized in earlier annual reports did not include the regional center of Kotzebue, by far the largest community in the district.

Little subsistence salmon harvest data were collected for Kotzebue District communities in 2005 through 2011, creating a large gap in statewide subsistence salmon harvest estimates. For example, from 1995 through 2001, the years that Kotzebue and most other district communities were included in the annual subsistence salmon harvest assessment program, Kotzebue District harvests averaged 77,098 fish, 7.7% of the statewide total, and ranged between 5.4% in 1998 (district harvests of 52,330 salmon) and 10.0% in 1999 (district harvests of 97,004 salmon) (Fall et al. 2017:12, 43–46).

Systematic collection of salmon harvest data in 2012–2014 in the majority of Kotzebue District communities that had been part of the former annual program resulted in more complete district harvest estimates for those years. Collection of this information has also enabled the division to design a method to interpolate harvest estimates for a core set of district communities to fill in critical gaps and produce better estimates of district subsistence salmon harvests for all years back to 1994.

The following protocols were followed to develop interpolated harvest estimates:

1. At least 3 years of data must be available upon which to interpolate an estimate for a missing year for a community;

8. Subsistence research projects since 2007 have included: (Fall et al. 2007:33) (Magdanz et al. 2011:49–50) (Magdanz et al. 2010) (Braem et al. 2013) (Braem et al. 2015) (Braem et al. 2017) (Braem, N.M. and M. Kostick. In Prep. "Key Fisheries in Northwest Alaska." Fairbanks: Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. XXX. Herinafter referred to as [Braem and Kostick In prep]).
9. Note that results from surveys in Point Hope were included in the Arctic District summary in the 2014 annual report. In this current report, Point Hope is included in the Kotzebue District, and data summaries for previous years have been modified to reflect this change.

2. Data gaps are only filled in for years after the third year of data becomes available. An exception is that an interpolated estimate for Kotzebue for 1994 was developed based on harvest data for 1995–1997;
3. The nearest 3 available estimates are used for each gap year;
4. In the event that 2 years are tied for being closest to a gap year, the most recent estimate is used;
5. Interpolated values using data available for this 2015 report will remain unchanged in future reports even if new data become available. Only future data gaps will be addressed, using the above protocol;
6. Based on data availability, a "core" set of 7 communities is part of every annual estimate. These are Ambler, Kiana, Kobuk, Kotzebue, Noatak, Noorvik, and Shungnak. Buckland and Selawik were added to the core set of communities post-2013, when a third year of data became available;
7. Shishmaref is an exception; it has been excluded from the core communities even though 3 harvest estimates are available, because of the large variability in those 3 estimates and the very wide time gaps between them;
8. For 2015, Point Hope is also an exception. This North Slope Borough community, while within the Kotzebue District, is close to the boundary with the Arctic District and harvests salmon in both districts. Point Hope residents harvest a relatively large number of salmon compared to other North Slope Borough communities. As discussed below, no new harvest data for Arctic District communities were collected for 2015, and 2014 harvest estimates based on household surveys were used to represent 2015 harvests. The 2014 harvest estimate for Point Hope was therefore also used for 2015 and added to the interpolated values for the 9 core communities within the Kotzebue District, as a step towards a more complete estimate for the entire management area;
9. If a salmon harvest estimate was, or becomes, available for a non-core community, it is included in the district total for that study year.

Table 3-7 shows, for each district community and each study year whether a salmon harvest estimate is available through fisheries specific or comprehensive harvest surveys or interpolated using the rules described above, and those for which a harvest estimate cannot be developed. The table provides an overview of which district communities are represented in each annual estimate for the district, and the source of the data.

These protocols were applied to produce a Kotzebue District subsistence salmon harvest estimate for 2015 (Table 3-8). Because no salmon harvest surveys were conducted for any district community for 2015, all the values in Table 3-8 for 9 core communities are interpolated, and the 2014 harvest estimate for Point Hope was used to represent the 2015 harvest. The harvest estimate for the district is 73,154 salmon, including 64,678 chum (88%), 4,259 coho (6%), 2,821 pink (4%), 783 sockeye (1%), and 613 Chinook (1%) (Figure 3-3). Historical harvest estimates for the Kotzebue District, 1994–2015, reported in Table 3-2 have been revised to include interpolated estimates, and therefore differ from estimates appearing in earlier annual reports. These revised annual estimates have also been used to revise the statewide estimates that are discussed in Chapter 2.

Arctic District

The Division of Subsistence conducted multiple harvest surveys in Arctic District communities (North Slope Borough) in 2012–2014, such that data reported in tables 3-9 and 3-10 are drawn from three separate projects identified above. Data for 2014 documented the fisheries in 6 of the 8 communities in the Arctic District (including Point Hope, results for which are included in the Kotzebue District totals) (tables 3-9 and 3-10). These findings, for salmon and nonsalmon fish were discussed in the 2014 annual report (Fall et al. 2017:38–39). Also, Table 3-11 summarizes all salmon harvest estimates for North Slope Borough communities (Arctic District and Point Hope), including those before 2012. Note that these

earlier (pre-2012) estimates are not included in statewide totals or used to develop district estimates because community coverage is very incomplete.

Fish harvest estimates for Point Lay are highly variable for the 3 most recent years (2012, 2013, 2014) for which information was collected. In 2014, residents of 5 Arctic district communities harvested about 8,332 salmon and 179,085 nonsalmon fish (about 2,111 of which were actually gallons of about 33 tiny fish). The composition of harvests varied dramatically between communities, both in the ratio of nonsalmon to salmon and also within the categories of salmon and nonsalmon fishes.

The ratio of salmon generally increased east to west. The inland community of Anaktuvuk Pass, high in the Brooks Range, reported zero harvest of salmon. The Colville River delta community of Nuiqsut, 150 miles east of Barrow, reported less than 1% of the fish harvests as salmon. In contrast, residents of the westernmost coastal community of Point Lay reported that 31% of the fish they caught were salmon.

Based on survey results for 2012–2014, subsistence salmon harvests in the Arctic District vary by community and also vary within the salmon category, with a general east to west trend of increasing diversity in the composition of the harvests. Chum salmon were the majority of fish reported in Nuiqsut (72%) and Barrow (66%), augmented primarily by pink salmon (27% and 23%). (The salmon supply in Barrow is augmented by catches from farther south, such as the Kenai Peninsula (Brown et al. 2016), probably more heavily than in the other communities because of statewide travel by many residents.) In Wainwright, 41% of the salmon were reported as coho salmon, followed by 19% pink, 18% chum salmon, and 17% sockeye salmon. In Point Lay, 60% of salmon were reported as pink salmon, followed by 18% sockeye, and just 13% chum.

No salmon harvest survey data are available for Arctic District communities for 2015. To fill this gap, harvest estimates for 4 communities (Barrow, Nuiqsut, Point Lay, and Wainwright) for 2014 were used as estimates for 2015. The total estimated harvest is 8,332 salmon, with most identified as chum (4,247 salmon; 51%), pink (2,594 salmon; 31%), and 846 coho (10%) (Table 3-12, Figure 3-4)

As described by Mikow et al (2016), fisheries in Alaska's Arctic are overshadowed by the volume of marine mammal and large land mammal harvests and the intensity of hunting for those resources, but salmon are an increasingly important feature of the seasonal round. Even without consideration of the actual edible pounds provided, 8,332 salmon (12,500 salmon if Point Hope is included) clearly represent a substantial amount of food. Additional research is needed to monitor and document changes to salmon abundance and availability near these communities, as well as the efforts made to catch them.

Northwest Alaska Subsistence Salmon Harvests

Table 3-13 combines harvest estimates for the Norton Sound-Port Clarence Area and the Arctic-Kotzebue Area to provide estimates to compare with previous annual reports, where a "Northwest Alaska" harvest summary was prepared. Harvest estimates in this table for 1994–2014 were revised to include the interpolated values developed for the Kotzebue District. The Northwest Alaska subsistence salmon harvest in 2015 of 168,897 salmon was composed primarily of chum (94,694 salmon; 56%) and pink (32,565 salmon; 19%). The total salmon harvest for the combined areas in 2015 exceeded recent 5 and 10 year averages as well as the long term average since 1994.

Table 3-1.–Subsistence salmon harvests by Norton Sound subdistricts, Northwest Alaska, 2015.

Subdistrict	Households surveyed or permits returned	Estimated salmon harvest[a]					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Cape Woolley	15	0	0	0	2	0	2
Elim	59	198	154	1,158	1,573	1,828	4,911
Golovin	187	147	71	1,091	2,250	4,443	8,002
Nome	529	21	1,081	1,790	3,967	3,180	10,039
Norton Bay	72	254	53	952	3,451	1,602	6,312
Shaktoolik	60	168	211	2,080	482	4,975	7,916
St Michael	89	475	33	762	4,634	237	6,141
Stebbins	98	299	4	2,122	2,798	359	5,582
Unalakleet	220	961	248	5,673	2,381	7,544	16,807
Total	**1,329**	**2,524**	**1,855**	**15,628**	**21,538**	**24,167**	**65,712**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. Includes subsistence harvests and commercial harvests retained for home use.

Table 3-2.–Historical subsistence salmon harvests by district, Northwest Alaska, 1994–2015.

	Norton Sound District						
Year	Number of households	Chinook	Sockeye	Coho	Chum	Pink	Total
1994	839	7,212	1,161	22,108	24,776	70,821	126,077
1995	851	7,766	1,222	23,015	43,014	38,594	113,612
1996	858	7,255	1,182	26,304	34,585	64,724	134,050
1997[a]	1,113	8,998	1,892	16,476	26,803	27,200	81,370
1998[a]	1,184	8,295	1,214	19,007	20,032	51,933	100,480
1999	898	6,144	1,177	14,342	19,398	20,017	61,078
2000	860	4,149	682	17,062	17,283	38,308	77,485
2001	878	5,576	767	14,550	20,213	30,261	71,367
2002	935	5,469	763	15,086	17,817	64,354	103,490
2003	940	5,290	801	14,105	13,913	49,674	83,782
2004	1,003	3,169	363	8,225	3,200	61,813	76,770
2005	1,061	4,087	774	13,896	12,008	53,236	84,000
2006	1,066	3,298	901	19,476	10,306	48,764	82,745
2007	1,041	3,744	923	13,564	18,170	21,714	58,116
2008	1,151	3,087	399	18,889	11,505	56,096	89,976
2009	1,200	5,131	388	15,852	10,599	26,110	58,080
2010	1,030	2,074	554	11,517	14,295	38,710	67,149
2011	925	1,645	562	10,155	12,946	18,576	43,883
2012	1,245	1,290	437	11,500	16,247	47,050	76,524
2013	1,062	859	571	13,343	15,491	18,007	48,271
2014	1,239	1,713	766	18,257	23,802	39,673	84,210
2015	1,329	2,524	1,855	15,628	21,538	24,167	65,712
5-year average (2010–2014)	1,100	1,516	578	12,954	16,556	32,403	64,007
10-year average (2005–2014)	1,102	2,693	628	14,645	14,537	36,794	69,295
Historical average (1994–2014)	1,018	4,583	833	16,035	18,400	42,173	82,025

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Table 3-2.–Page 2 of 4.

Year	Port Clarence District						
	Number of households	Chinook	Sockeye	Coho	Chum	Pink	Total
1994	151	203	2,220	1,892	2,294	4,309	10,918
1995	151	76	4,481	1,739	6,011	3,293	15,600
1996	132	194	2,634	1,258	4,707	2,236	11,029
1997	163	158	3,177	829	2,099	755	7,019
1998	157	289	1,696	1,759	2,621	7,815	14,179
1999	177	89	2,392	1,030	1,936	786	6,233
2000	163	72	2,851	935	1,275	1,387	6,521
2001	160	84	3,692	1,299	1,910	1,183	8,167
2002	176	133	3,732	2,194	2,699	3,394	12,152
2003	242	176	4,436	1,434	2,425	4,108	12,578
2004	371	278	8,688	1,131	2,505	5,918	18,520
2005	329	152	8,532	726	2,478	6,593	18,481
2006	345	133	9,862	1,057	3,967	4,925	19,944
2007	362	85	9,484	705	4,454	1,468	16,196
2008	399	125	5,144	562	2,499	7,627	15,957
2009	328	40	1,643	799	3,060	1,887	7,429
2010	295	57	824	596	5,232	5,202	11,911
2011	271	56	1,611	393	4,338	2,610	9,008
2012	335	44	1,422	703	7,802	5,201	15,172
2013	431	38	5,243	651	6,588	1,788	14,308
2014	429	21	3,969	564	5,085	4,940	14,579
2015	549	64	13,872	550	4,231	2,982	21,699
5-year average (2010–2014)	352	43	2,614	581	5,809	3,948	12,996
10-year average (2005–2014)	352	75	4,773	676	4,550	4,224	14,299
Historical average (1994–2014)	265	119	4,178	1,060	3,618	3,687	12,662

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Table 3-2.–Page 3 of 4.

Year	Kotzebue District[b,c]						
	Number of households	Chinook	Sockeye	Coho	Chum	Pink	Total
1994[d]	774	501	499	1,268	91,382	4,213	97,863
1995	1,327	228	935	2,560	102,880	2,059	108,662
1996	1,187	550	471	317	99,740	951	102,029
1997	1,122	464	528	848	57,906	1,181	60,925
1998	1,279	383	392	461	48,979	2,116	52,330
1999	1,277	9	478	1,334	94,342	841	97,004
2000	1,227	211	75	2,557	65,975	75	68,893
2001[e]	1,188	26	15	792	52,394	59	53,286
2002[f]	580	94	174	728	61,888	360	63,243
2003[g,h]	609	110	216	1,654	38,918	863	41,762
2004[g]	548	124	181	2,115	50,796	1,540	54,756
2005[i]	522	120	295	1,728	52,874	993	56,011
2006[i,j]	666	343	2,025	4,603	54,698	3,608	65,277
2007[i,j]	585	167	434	1,854	51,205	1,049	54,709
2008[i]	529	128	480	2,240	58,595	1,164	62,607
2009[i]	535	151	799	2,259	57,939	1,124	62,272
2010[i]	534	138	730	2,114	57,354	1,105	61,441
2011[i,j]	600	147	891	2,659	59,037	1,093	63,826
2012[k]	513	111	809	1,557	49,465	832	52,775
2013[l]	828	382	702	4,280	69,872	1,841	77,077
2014[m]	1,057	681	3,073	6,583	72,551	5,382	88,270
2015[n]	854	613	783	4,259	64,678	2,821	73,154
5-year average (2010–2014)	706	292	1,241	3,439	61,656	2,050	68,678
10-year average (2005–2014)	637	237	1,024	2,988	58,359	1,819	64,426
Historical average (1994–2014)	833	241	676	2,120	64,228	1,545	68,810

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Table 3-2.–Page 4 of 4.

Year	Arctic District[o] Number of households	Chinook	Sockeye	Coho	Chum	Pink	Total
2012	120	34	79	477	710	1,256	2,556
2013	122	62	151	147	337	238	935
2014	485	126	519	846	4,247	2,594	8,332
2015	432	126	519	846	4,247	2,594	8,332
Historical average (2012–2014)	242	74	250	490	1,764	1,363	3,941

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. Includes Gambell and Savoonga.

b. Formerly Kotzebue Area.

c. For 1994–2001, normally included Ambler, Kiana, Kobuk, Kotzebue, Noatak, Noorvik, and Shungnak. See Table 3-7 for details.

d. Also includes Deering, Wales, Shishmaref, and Point Hope; includes imputed values for Kotzebue.

e. Includes imputed estimates for Ambler.

f. Includes Kotzebue, Noatak, Noorvik, and imputed values for Kobuk, Kiana, Ambler, and Shungnak.

g. Kotzebue values for species other than chum are imputed.

h. Core communities for Kotzebue Sound have been imputed based on data collected in other years, see Table 3-7.

i. Formerly Kotzebue Area.

j. Limited data exist in 2006, 2007 and 2011 for Kiana (2006), Kivalina (2007), Noatak (2007), and Selawik (2011). These are available online through the Community Subsistence Information System (CSIS) at http://www.adfg.alaska.gov/sb/CSIS/, other core values have been imputed, see Table 3-7.

k. Includes Ambler, Kiana, Kobuk, Noatak, Noorvik, Shungnak, and imputed values for Kotzebue.

l. Includes Ambler, Buckland, Deering, Diomede, Kiana, Kobuk, Noatak, Noorvik, Selawik, and Shungnak, and imputed values for Kotzebue.

m. Includes Ambler, Buckland, Kiana, Kobuk, Kotzebue, Noatak, Noorvik, Point Hope, Selawik, Shishmaref, and Shungnak.

n. No harvest data collected. Imputed values for nine core communities and Point Hope; see Table 3-7.

o. Includes Point Lay and Wainwright for 2012 and 2013. Includes Anaktuvuk Pass, Barrow, Nuiqsut, Point Lay, and Wainwright for 2014. No new harvest data collected for 2015; values for 2014 used to represent 2015 harvests.

ND = no data.

Table 3-3.–Subsistence salmon harvests by district, Norton Sound-Port Clarence, and Arctic-Kotzebue Areas, 2015.

District	Households surveyed or permits returned	Estimated salmon harvest[a]					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Norton Sound District[b]	1,329	2,524	1,855	15,628	21,538	24,167	65,712
Port Clarence District[c]	549	64	13,872	550	4,231	2,982	21,699
Kotzebue District[d]	749	613	783	4,259	64,678	2,821	73,154
Arctic District[e]	432	126	519	846	4,247	2,594	8,332
Total	**3,059**	**3,327**	**17,028**	**21,283**	**94,694**	**32,565**	**168,896**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. Harvests reported during household surveys are expanded into estimates to account for uncontacted households. Harvests reported on permits are not expanded.

b. Household surveys conducted in Unalakleet, Koyuk, and Shaktoolik. Permits issued for Cape Woolley, Nome Subdistrict (Tier I), Golovin Subdistrict, and Elim Subdistrict.

c. Permits issued for Port Clarence District, Pilgrim River, and Salmon Lake.

d. No new harvest data were collected for 2015. Harvest estimates are imputed based on the most recent 3 years of data for 9 core communities in the district, plus 2014 values for Point Hope. See Table 3-7.

e. No new harvest data were collected. Estimates for 2014 used to represent 2015 harvests.

ND = no data

Table 3-4.–Subsistence salmon harvests by community, Norton Sound-Port Clarence Area, Alaska, 2015.

	Households or permits		Estimated salmon harvest[a]					
Community[b]	Total	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Anchorage	22	22	1	316	12	21	19	369
Barrow	2	2	0	0	0	2	6	8
Brevig Mission	45	45	29	1,761	403	1,967	1,918	6,078
Eagle River	1	1	0	0	0	1	0	1
Elim	50	50	193	154	1,114	1,519	1,519	4,499
Fairbanks	4	4	0	75	0	0	0	75
Golovin	32	32	64	53	309	405	2,750	3,581
Homer	2	2	0	11	0	17	1	29
Koyuk	79	75	254	78	952	3,457	1,602	6,343
Nome	1,088	1,088	81	11,890	2,166	5,337	4,245	23,719
Palmer	4	4	0	50	0	14	0	64
Shaktoolik	67	60	168	211	2,080	482	4,975	7,916
Saint Michael	93	89	475	33	762	4,634	237	6,141
Stebbins	132	98	299	4	2,122	2,798	359	5,582
Teller	42	42	20	827	73	1,423	649	2,992
Unalakleet	260	220	961	248	5,673	2,381	7,544	16,807
Wasilla	1	1	0	0	0	0	0	0
White Mountain	43	43	42	16	512	1,311	1,326	3,207
Total	**1,967**	**1,878**	**2,588**	**15,727**	**16,178**	**25,769**	**27,149**	**87,411**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. Includes subsistence harvests and commercial harvests retained for home use.

b. Harvest information from residents of non-local communities (e.g. Anchorage) is available only for Norton Sound and Port Clarence permit areas. Non-local residents might subsistence fish in other Northwest Alaska areas, but these harvests are not documented in the regional household surveys.

Table 3-5.–Subsistence salmon harvests by Kotzebue District[a] communities, 2006–2014.

		Households		Estimated salmon harvest					
Year	Community	Total	Surveyed	Chinook	Sockeye	Coho	Chum	Pink	Total
2006	Kiana	95	77	43	270	510	4,604	89	5,516
	Shishmaref	132	75	155	1,056	2,091	938	1,765	6,005
	Wales	41	39	43	452	475	407	829	2,206
Total, 2006		**268**	**191**	**241**	**1,778**	**3,076**	**5,949**	**2,684**	**13,727**
2007	Kivalina	81	42	41	0	33	401	120	594
	Noatak	119	90	11	42	247	4,167	163	4,630
Total, 2007		**200**	**132**	**51**	**42**	**280**	**4,568**	**283**	**5,224**
2011	Selawik	169	61	0	167	7	879	0	1,053
2012	Ambler	76	53	1	126	11	1,621	9	1,769
	Kiana	103	65	3	63	240	2,442	320	3,068
	Kobuk	36	30	4	0	14	2,637	4	2,659
	Noatak	126	83	2	94	612	7,814	80	8,601
	Noorvik	135	83	7	81	338	9,584	275	10,285
	Shungnak	69	46	0	90	15	2,595	9	2,709
Total, 2012		**545**	**360**	**16**	**455**	**1,230**	**26,694**	**697**	**29,092**
2013	Ambler	69	52	8	9	187	4,320	260	4,784
	Buckland	105	87	226	236	838	3,104	129	4,533
	Deering	44	32	1	34	327	1,309	849	2,521
	Diomede	39	25	0	16	0	109	27	151
	Kiana	93	68	5	37	161	2,969	212	3,384
	Kobuk	31	24	3	1	0	2,043	9	2,056
	Noatak	125	94	5	0	1,233	5,655	32	6,925
	Noorvik	132	99	37	15	1,207	19,972	173	21,404
	Selawik	171	145	1	0	0	362	15	378
	Shungnak	65	49	0	0	0	7,257	0	7,257
Total, 2013		**874**	**675**	**286**	**348**	**3,953**	**47,100**	**1706**	**53,394**
2014	Ambler	74	55	5	40	369	4,182	336	4,933
	Buckland	98	90	250	318	1,144	4,188	957	6,857
	Kiana	98	73	3	3	75	2,849	31	2,960
	Kobuk	33	28	0	0	4	1,840	0	1,843
	Noatak	125	106	38	6	1,859	6,577	126	8,605
	Noorvik	124	96	32	133	619	16,668	920	18,371
	Point Hope	176	105	142	13	1,123	1,723	1,170	4,172
	Selawik	183	161	23	10	11	1,151	122	1,317
	Shishmaref	140	86	142	1,924	1,027	7,129	1,281	11,503
	Shungnak	62	43	0	0	29	5,101	72	5,202
	Kotzebue	826	214	46	625	324	21,144	367	22,507
Total, 2014		**1,939**	**1057**	**681**	**3,073**	**6,583**	**72,551**	**5,382**	**88,270**

Source ADF&G Division of Subsistence, household surveys, 2008, 2012, 2013, 2014, 2015.

a. Formerly Kotzebue Area.

Table 3-6.–Subsistence nonsalmon harvests by Kotzebue District[a] communities, 2006–2014.

Year	Community	Households		Estimated number of fish									
		Total	Surveyed	Dolly Varden	Arctic grayling	Burbot	Broad whitefish	Humpback whitefish	Unknown whitefishes	Northern pike	Saffron cod	Sheefish	Total
2006	Kiana[b]	95	77	413	113	909	ND	ND	0	1,043	4	1,298	3,780
	Shishmaref[b]	132	75	1,331	1,533	176	ND	ND	0	0	20,131	42	23,212
	Wales[b]	41	39	220	11	0	ND	ND	0	0	6.3	0	237
Total, 2006		**268**	**191**	**1,963**	**1,656**	**1,085**	**0**	**0**	**0**	**1,043**	**20,141**	**1,340**	**27,229**
2007	Kivalina[b]	81	42	20,527	786	15	ND	ND	0	0	25,824	0	47,152
	Noatak[b]	119	90	10,234	1,222	42	ND	ND	0	144	192	99	11,933
Total, 2007		**200**	**132**	**30,761**	**2,008**	**58**	**0**	**0**	**0**	**144**	**26,015**	**99**	**59,086**
2011	Selawik	169	61	19	815	1,081	47,394	12,647	0	15,956	0	6,190	84,102
2012	Ambler	76	53	85	948	146	9,150	1,544	0	568	0	1,156	13,597
	Kiana	103	65	249	ND	464	3,596	2,307	0	278	ND	1,787	8,682
	Kobuk	36	30	40	256	23	286	157	0	96	0	1,062	1,919
	Noatak	126	83	6,437	352	ND	1,826	1,205	0	26	ND	100	9,946
	Noorvik	135	83	99	28	876	10,087	6,406	0	5,134	0	6,032	28,662
	Shungnak	69	46	99	399	50	888	660	0	38	0	1,556	3,689
Total, 2012		**545**	**360**	**7,008**	**1,983**	**1,559**	**25,833**	**12,280**	**0**	**6,139**	**0**	**11,694**	**66,496**
2013	Ambler	69	52	175	646	40	3,496	2,301	0	673	11	2,649	9,991
	Buckland	105	87	341	10	120	333	1,118	0	246	ND	1,013	3,180
	Deering	44	32	489	135	92	21	94	0	150	296	176	1,452
	Diomede	39	25	0	0	0	0	0	0	0	0	0	0
	Kiana	93	68	54	ND	316	2,832	3,251	0	242	ND	1,787	8,482
	Kobuk	31	24	22	140	0	1,337	1,382	12,211	61	ND	865	16,018
	Noatak	125	94	6,223	ND	78	2,219	358	0	63	0	247	9,188
	Noorvik	132	99	207	ND	815	14,380	15,945	0	7,932	27	3,167	42,473
	Selawik	171	145	0	33	795	23,159	7,648	0	10,593	0	8,829	51,057
	Shungnak	65	49	44	110	42	578	8,400	0	127	ND	3,559	12,860

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Table 3-6.–Page 2 of 2

Year	Community	Households		Estimated number of fish									
		Total	Surveyed	Dolly Varden	Arctic grayling	Burbot	Broad whitefish	Humpback whitefish	Unknown whitefishes	Northern pike	Saffron cod	Sheefish	Total
Total, 2013		**874**	**675**	**7,555**	**1,074**	**2,298**	**48,355**	**40,496**	**12,211**	**20,087**	**334**	**22,292**	**154,701**
2014	Ambler	74	55	67	908	417	9,492	3,352	0	358	ND	1,806	16,400
	Buckland	98	90	747	1	312	1,150	105	0	99	11,807	1,067	15,288
	Kiana	98	73	351	ND	320	4,113	4,570	0	419	0	1,073	10,846
	Kobuk	33	28	11	231	41	7	2,251	0	55	ND	781	3,377
	Noatak	125	106	9,289	84	21	879	1,165	0	44	47	206	11,735
	Noorvik	124	96	260	ND	306	11,728	11,660	568	5,975	0	2,964	33,462
	Point Hope	176	105	5,692	7,006	ND	240	39	ND	ND	ND	0	12,977
	Selawik	183	161	2	126	298	17,202	5,250	0	8,855	0	4,164	35,897
	Shishmaref	140	86	1,205	969	34	230	1,037	8	0	34,209	11	37,702
	Shungnak	62	43	216	1,116	19	7,776	1,067	0	29	ND	3,123	13,346
	Kotzebue	826	214	2,116	182	50	201	367	0	436	17,118	17,322	37,792
Total, 2014		**1,939**	**1057**	**19,955**	**10,623**	**1,819**	**53,017**	**30,862**	**576**	**16,270**	**63,181**	**32,517**	**228,821**

Source ADF&G Division of Subsistence, household surveys, 2008, 2012, 2013, 2014, 2015.

a. Formerly Kotzebue Area.

b. Harvest information is available for whitefishes as a species category only. Kiana harvested 10,834 whitefishes, Shishmaref harvested 4,616, and Wales harvested 262 in 2006. Kivalina harvested 338 whitefishes and Noatak harvested 6,778 in 2007.

ND = no data

Table 3-7.–Communities of the Kotzebue District for which salmon harvest estimates are available through postseason harvest surveys, 1994–2015.

	Ambler[a]	Buckland[b]	Deering	Diomede	Kiana[a]	Kivalina	Kobuk[a]	Kotzebue[a]	Noatak[a]	Noorvik[a]	Pt. Hope	Selawik[b]	Shishmaref	Shungnak[a]	Wales
1994	X		X		X		X		X	X	XX		X	X	X
1995	X				X		X	X	X	X				X	
1996	X				X		X	X	X	X				X	
1997	X				X		X	X	X	X				X	
1998	X				X		X	X	X	X				X	
1999	X				X		X	X	X	X				X	
2000	X				X		X	X	X	X				X	
2001					X		X	X	X	X				X	
2002								XX	X	X					
2003	X	XX			X		X	XX	X	X				X	
2004	X				X		X	XX	X	X				X	
2005															
2006					XX								XX		XX
2007						XX			XX						
2008															
2009															
2010															
2011												XX			
2012	X				X		X		X	X				X	
2013	X	X	XX	XX	X		X		X	X		X		X	
2014	X	X			X		X	X	X	X	X	X	XX	X	
2015															

X = harvest data are the product of annual salmon harvest monitoring programs (1994–2004) or salmon-specific harvest surveys (2012+)

XX = harvest data are product of comprehensive household harvest survey project

Harvest estimates interpolated based on available survey data and used to estimate district harvests.

Harvest estimates cannot be interpolated based on available data; no community estimate included in district total.

Estimated harvest for 2014 used to represent Point Hope harvest in 2015.

a. Communities included in all Kotzebue District salmon estimates ("core communities"), 1994–present

b. Communities included in all Kotzebue District salmon estimates post-2012

Sources For communities not part of annual subsistence salmon harvest surveys: Whiting (2007) for Kotzebue 2002–2004; Bacon et al. (2009) for Point Hope 1994; CSIS for all others

Table 3-8.–Imputed subsistence salmon harvests for Kotzebue District[a] communities, 2015.

	Households		Estimated salmon harvest					
Community	Total	Surveyed	Chinook	Sockeye	Coho	Chum	Pink	Total
Ambler	75	55	4	58	189	3,201	200	3,652
Buckland	98	87	299	231	917	3,048	494	4,989
Kiana	100	70	4	15	88	2,053	167	2,327
Kobuk	34	28	2	0	6	2,156	54	2,218
Kotzebue	599	153	122	281	215	25,282	169	26,068
Noatak	126	94	14	20	980	5,337	79	6,429
Noorvik	134	93	25	76	721	15,339	456	16,618
Point Hope[b]	176	105	142	13	1,123	1,723	1,170	4,172
Selawik	175	123	0	58	6	1,678	5	1,748
Shungnak	66	47	0	30	15	4,861	27	4,932
Total	**1,583**	**854**	**613**	**783**	**4,259**	**64,678**	**2,821**	**73,154**

Source Estimates based on ADF&G Division of Subsistence, household surveys, 2008, 2012, 2013, 2014, 2015.

a. Formerly Kotzebue Area.

b. For Point Hope, value for 2014 used to represent 2015.

Table 3-9.–Subsistence salmon harvests by Arctic District communities, 2012–2014.

		Households		Estimated salmon harvest					
Year	Community	Total	Surveyed	Chinook	Sockeye	Coho	Chum	Pink	Total
2012	Point Lay	67	42	14	13	372	659	1,120	2,178
	Wainwright	152	78	20	66	105	51	136	378
Total, 2012		**219**	**120**	**34**	**79**	**477**	**710**	**1,256**	**2,556**
2013	Point Lay	64	42	0	30	3	157	84	274
	Wainwright	150	80	62	121	144	180	154	661
Total, 2013		**214**	**122**	**62**	**151**	**147**	**337**	**238**	**935**
2014	Anaktuvuk Pass	99	53	0	0[a]	0	0	0	0
	Barrow	1,584	259	67	73	495	3,639	1,248	5,523
	Nuiqsut	108	58	0	2	0	261	99	361
	Point Lay	63	40	32	358	142	258	1,151	1,940
	Wainwright	145	75	27	86	209	89	97	507
Total, 2014		**1,999**	**485**	**126**	**519**	**846**	**4,247**	**2,594**	**8,332**

Source ADF&G Division of Subsistence, household surveys, 2015.

a. An estimated 56 sockeye salmon were harvested with dip nets in the Chitina personal use fishery (Brown et al. 2016:421).

Table 3-10.–Subsistence nonsalmon harvests by Arctic District communities, 2012–2014.

		Households		Estimated number of fish										
Year	Community	Total	Surveyed	Arctic char / Dolly Varden	Arctic cisco	Arctic grayling	Bering cisco	Broad whitefish	Humpback whitefish	Least cisco	Round whitefish	Sheefish	Smelt[a]	Total
2012	Point Lay	67	42	493	279	1,945	479	0	5	0	479	37	55	3,770
	Wainwright	152	78	0	0	7,513	648	1,562	1,606	624	0	0	3,489	15,442
Total, 2012		**219**	**120**	**493**	**279**	**9,458**	**1,127**	**1,562**	**1,611**	**624**	**479**	**37**	**3,545**	**19,212**
2013	Point Lay	64	42	20	0	2,670	0	0	8	0	0	0	73	2,771
	Wainwright	150	80	62	934	3,056	4,104	508	253	1,554	19	38	1,480	12,008
Total, 2013		**214**	**122**	**82**	**934**	**5,726**	**4,104**	**508**	**261**	**1,554**	**19**	**38**	**1,553**	**14,780**
2014	Anaktuvuk Pass	99	53	1,200	0	2,519	0	0	47	19	4	0	0	3,787
	Barrow	1,584	259	398	17,510	11,173	0	43,962	1,500	13,375	654	0	225	88,797
	Nuiqsut	108	58	648	46,277	1,626	19	11,439	119	13,332	19	0	152	73,632
	Point Lay	63	40	69	9	4,078	11	25	3	2	0	0	97	4,294
	Wainwright	145	75	213	696	2,714	58	3,180	44	97	0	10	1,563	8,575
Total, 2014		**1,999**	**485**	**2,527**	**64,492**	**22,110**	**88**	**58,607**	**1,713**	**26,825**	**677**	**10**	**2,037**	**179,085**

Source ADF&G Division of Subsistence, household surveys, 2015.

a. Smelt are counted in gallons.

Table 3-11.– Subsistence salmon harvest estimates, North Slope Borough communities.

		Estimated Number of Salmon Harvested						
Community	Year	Chinook	Sockeye	Coho	Chum	Pink	Unknown	Total Salmon
Anaktuvuk Pass[a]	1992							0
Anaktuvuk Pass[a]	1994							0
Anaktuvuk Pass[a]	1996					68		68
Anaktuvuk Pass[a]	1998			3				3
Anaktuvuk Pass[a]	1999							0
Anaktuvuk Pass[a]	2000							0
Anaktuvuk Pass[a]	2001							0
Anaktuvuk Pass[a]	2002							0
Anaktuvuk Pass[b]	2011	37		47	1		3	88
Anaktuvuk Pass[b]	2014		56[f]					56
Atkasuk[b]	1994	0	0	14	0	0	0	14
Atkasuk[b]	1996	4	0	0	6	0	0	9
Atkasuk[b]	1997	0	0	0	0	40	0	40
Barrow[c]	1987	4	0	103	11	12	66	196
Barrow[c]	1988	1	0	70	5	1	3	80
Barrow[c]	1989	31	0	828	529	262	439	2,088
Barrow[b]	1992	287	0	777	0	573	0	1,637
Barrow[b]	1995	6	0	27	0	51	204	288
Barrow[b]	1996	9	0	78	203	0	55	345
Barrow[b]	2000	165	0	463	374	1,085	12	2,100
Barrow[b]	2001	34	0	93	63	107	36	332
Barrow[b]	2003	439	0	845	1,617	1,050	44	3,995
Barrow[d]	2014	67	73	495	3,639	1,248	0	5,523
Kaktovik[c]	1985	0	0	0	0	0	0	0
Kaktovik[c]	1986	0	0	0	0	0	0	0
Kaktovik[c]	1992	0	0	0	0	8	42	50
Kaktovik[b]	1994	0	0	0	1	0	0	1
Kaktovik[b]	2002	0	0	0	0	0	0	0

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Table 3-11.–Page 2 of 2.

Community	Year	Estimated Number of Salmon Harvested						
		Chinook	Sockeye	Coho	Chum	Pink	Unknown	Total Salmon
Nuiqsut[c]	1985	0	0	0	0	441	0	441
Nuiqsut[b]	1992	3	0	5	0	0	0	8
Nuiqsut[c]	1993	10	0	12	70	160	19	272
Nuiqsut[b]	1994	0	0	0	0	10	0	10
Nuiqsut[b]	1995	0	0	0	0	0	42	42
Nuiqsut[b]	2000	3	0	5	0	0	2	10
Nuiqsut[b]	2014	0	2	0	261	99	0	361
Point Hope[b,e]	1992	266	0	554	0	801	0	1,621
Point Hope[b,e]	1994	0	0	214	641	0	6,197	7,052
Point Hope[de]	2014	142	13	1,123	1,723	1,170	0	4,172
Point Lay[c]	1987	0	0	0	40	107	0	147
Point Lay[b]	1994	4	0	182	3	200	86	476
Point Lay[b]	2002	2	70	99	2	0	0	173
Point Lay[d]	2012	14	13	372	659	1,120	0	2,178
Point Lay[d]	2013	0	30	3	157	84	0	274
Point Lay[d]	2014	32	358	142	258	1,151	0	1,940
Wainwright[c]	1988	0	0	0	3	6	2	11
Wainwright[c]	1989	9	0	0	68	52	0	129
Wainwright[b]	1992	50	0	214	0	99	0	363
Wainwright[b]	2002	0	0	120	28	129	44	321
Wainwright[d]	2012	20	66	105	51	136	0	378
Wainwright[d]	2013	62	121	144	180	154	0	661
Wainwright[d]	2014	27	86	209	89	97	0	507

a. Known estimates of salmon harvests in Arctic District communities based on household surveys since 1985. Only estimates since 2012 are included in area and statewide totals.

b. Source: Bacon et al. rev2011

c. CSIS

d. Fall et al. 2017

e. The North Slope Borough community of Point Hope is within the Kotzebue District, but near the boundary with the Arctic District, and harvests salmon and other fish in both districts.

f. An estimated 56 sockeye salmon were harvested with dip nets in the Chitina personal use fishery (Brown et al. 2016:421).

Table 3-12.–Estimated subsistence salmon harvests for Arctic District communities, 2015.

	Households		Estimated salmon harvest[a]					
Community	Total	Surveyed	Chinook	Sockeye	Coho	Chum	Pink	Total
Barrow	1,584	259	67	73	495	3,639	1,248	5,523
Nuiqsut	108	58	0	2	0	261	99	361
Point Lay	63	40	32	358	142	258	1,151	1,940
Wainwright	145	75	27	86	209	89	97	507
Total	**1,900**	**432**	**126**	**519**	**846**	**4,247**	**2,594**	**8,332**

Source ADF&G Division of Subsistence, household surveys, 2015.

a. Values for 2014 used to represent 2015 harvests.

Table 3-13.–Historical subsistence salmon harvests, Northwest Alaska, 1975–2015.

Year	Households or permits		Estimated salmon harvest[a]					
	Total	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1975	117	79	3	225	102	3,698	7,298	11,326
1976	138	104	6	0	275	1,856	5,472	7,609
1977	195	181	35	64	623	12,222	2,839	15,783
1978	168	126	31	0	242	4,035	10,697	15,005
1979	138	119	519	0	1,007	3,419	5,842	10,787
1980	232	161	135	0	2,075	5,839	21,728	29,777
1981	236	169	47	88	1,844	9,251	6,100	17,330
1982	230	182	33	6	2,093	5,719	20,480	28,331
1983	243	189	74	40	1,950	7,013	8,499	17,576
1984	240	189	85	0	1,890	4,945	18,067	24,987
1985	215	198	56	114	1,054	5,717	2,117	9,058
1986	279	240	157	127	788	8,494	9,011	18,577
1987	235	173	97	102	812	7,265	705	8,981
1988	192	166	67	171	1,089	6,379	2,543	10,249
1989	173	130	24	131	549	3,456	924	5,084
1990	188	165	60	234	542	4,525	2,413	7,774
1991	155	128	83	166	1,279	3,715	194	5,437
1992	163	132	152	163	1,720	2,030	7,746	11,811
1993	142	104	51	74	1,780	1,578	758	4,241
1994	2,390	1,386	8,079	3,880	25,284	118,696	79,588	235,527
1995	2,329	1,445	8,070	6,639	27,314	151,905	43,947	237,875
1996	2,177	1,454	7,999	4,287	27,879	139,032	67,911	247,108
1997	2,398	1,645	9,620	5,597	18,153	86,808	29,135	149,313
1998	2,620	1,730	8,967	3,301	21,226	71,632	61,863	166,989
1999	2,351	1,300	6,242	4,046	16,706	115,676	21,644	164,315
2000	2,247	1,336	4,399	3,612	20,654	84,196	40,499	153,360
2001	2,261	1,298	5,686	4,474	16,641	74,517	31,503	132,820
2002	2,047	1,568	5,715	4,669	18,511	82,404	68,108	179,407
2003	2,141	1,609	5,576	5,453	17,192	55,257	54,646	138,122
2004	2,386	1,922	3,604	9,322	12,198	58,834	71,122	155,080
2005	2,084	1,626	4,359	9,600	16,350	67,360	60,822	158,491
2006	2,257	1,765	3,774	12,788	25,136	68,971	57,297	167,966
2007	2,185	1,658	3,996	10,841	16,123	73,829	24,231	129,020
2008	2,237	1,701	3,340	6,023	21,691	72,599	64,887	168,540
2009	2,404	1,741	5,322	2,830	18,910	71,598	29,121	127,781
2010	2,238	1,566	2,269	2,108	14,227	76,881	45,017	140,502
2011	2,348	1,532	1,848	3,064	13,207	76,320	22,278	116,718
2012	2,633	1,867	1,479	2,747	14,237	74,224	54,339	147,027
2013	2,735	1,972	1,339	6,617	18,094	90,902	20,998	137,950
2014	5,137	2,690	2,399	6,403	25,222	98,557	51,307	183,888
2015	5,450	3,164	3,326	17,028	21,283	94,694	32,565	168,897
5-year average (2010–2014)	3,018	1,925	1,867	4,188	16,997	83,377	38,788	145,217
10-year average (2005–2014)	2,626	1,812	3,013	6,302	18,320	77,124	43,030	147,788
Historical average (1975–2014)	2,457	1,658	4,956	5,633	19,284	86,200	47,632	163,705

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Table 3-13.–Page 2 of 2.

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Note Since 1994 ADF&G has conducted an annual subsistence salmon harvest assessment effort in Northwest Alaska that provides more extensive and reliable estimates. Harvest estimates prior to 1994 cannot be directly compared.

a. After 1994, includes selected communities in the Norton Sound District, Port Clarence District, Arctic District, and Kotzebue District (formerly Kotzebue Area) that were part of annual harvest assessment programs or a postseason survey. Also includes imputed vales for a core set of Kotzebue District communities beginning in 1994. See Table 3-3 and Table 3-7 for details on which communities were included for study years since 1994. Harvest estimates are only available since 2012 for selected Arctic District communities. See Table 3-7 and Table 3-9 for details.

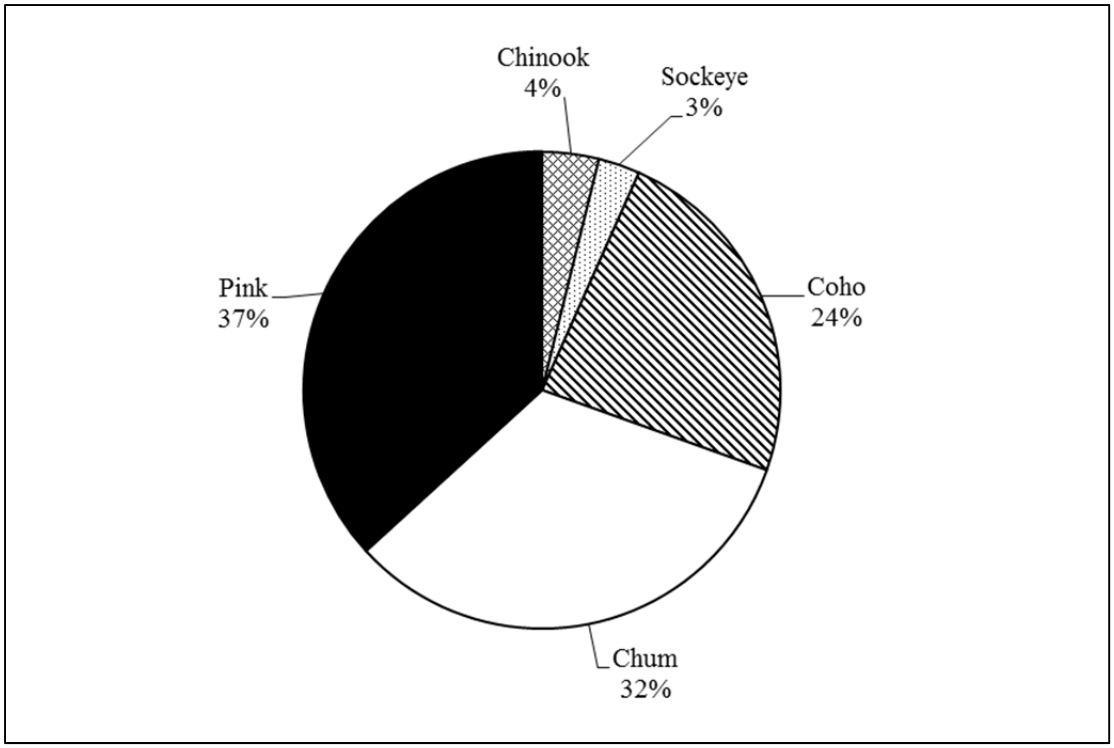

Figure 3-1.–Species composition of estimated subsistence salmon harvests, Norton Sound District, 2015.

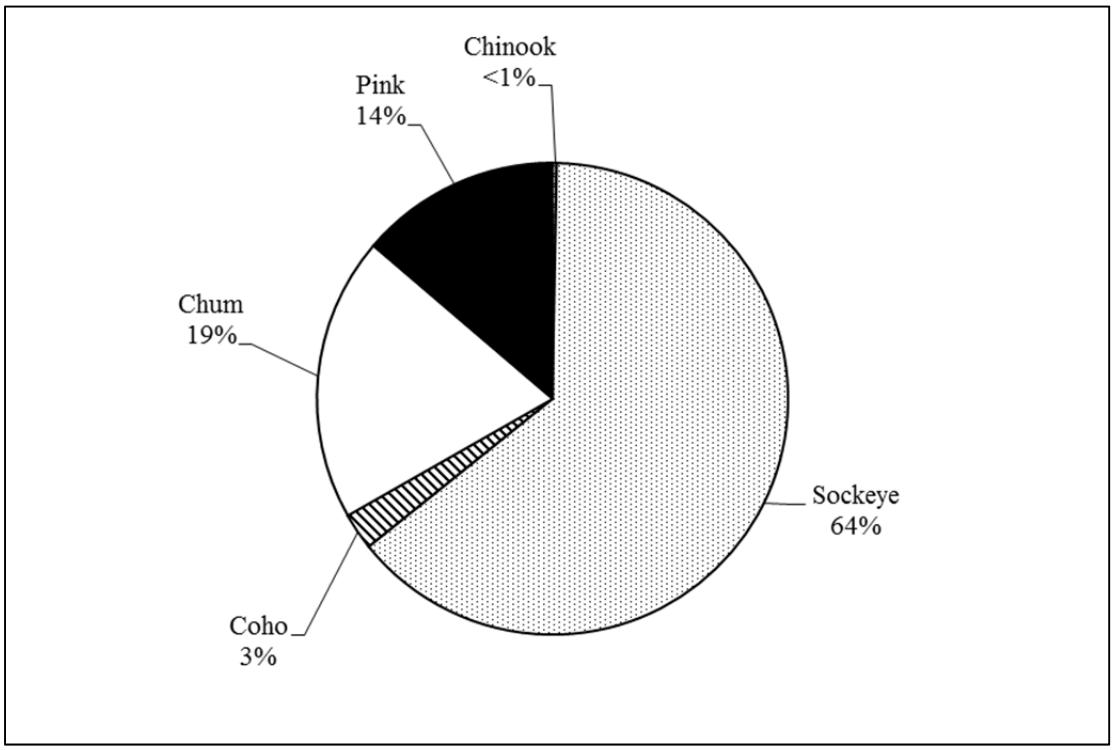

Figure 3-2.–Species composition of estimated subsistence salmon harvests, Port Clarence District, 2015.

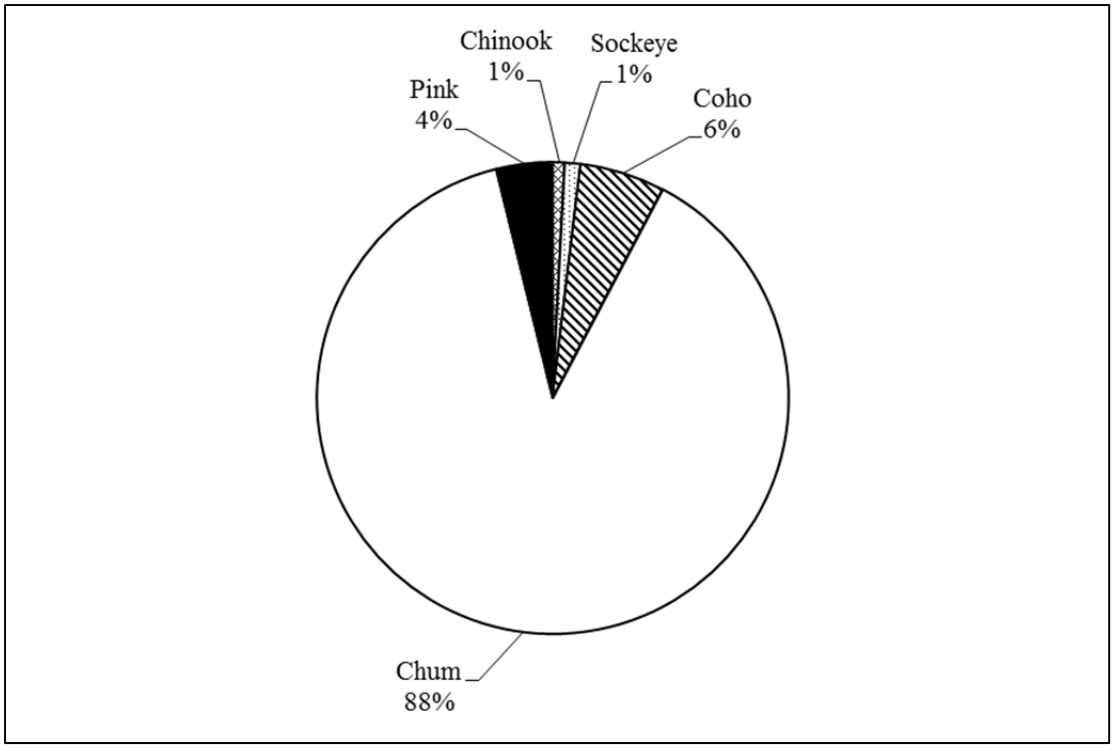

Figure 3-3.–Species composition of estimated subsistence salmon harvests, Kotzebue District, 2015.

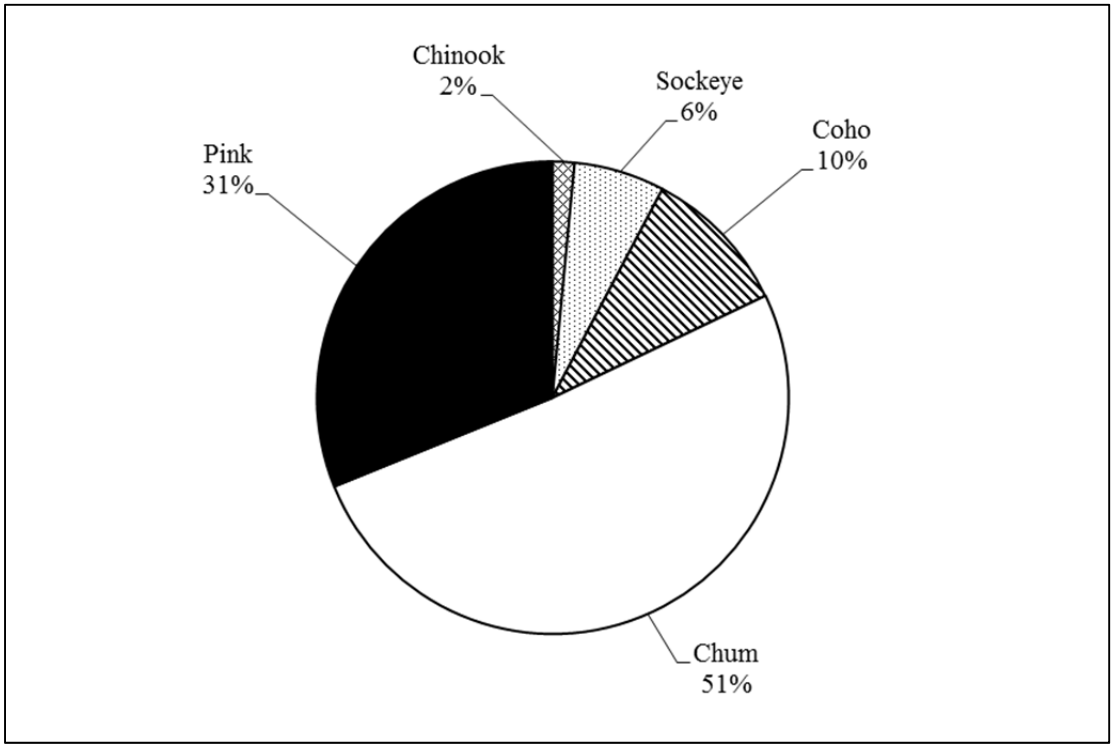

Figure 3-4.–Species composition of estimated subsistence salmon harvests, Arctic District, 2015.

CHAPTER 4: YUKON AREA

BACKGROUND

Residents of the Yukon River drainage have long relied on fish for human food and other subsistence uses. While nonsalmon fish species are an important component of the overall fish harvest (Andersen et al. 2004; Brown et al. 2005), large numbers of salmon compose the majority of all subsistence harvests of fish in the Yukon River drainage. Indeed, subsistence salmon harvests have occurred alongside robust commercial, sport, and personal use harvests across species.

Yukon Area fishers use drift gillnets, set gillnets, and fish wheels to harvest the majority of salmon. Set gillnets are used throughout the Yukon Area, often in the main rivers and coastal marine waters. Drift gillnets are used extensively in about half of the river. Under state regulations, drift gillnets are allowed from the mouth of the Yukon River to approximately 18 miles downriver of Galena, and under federal permit in subdistricts 4B and 4C. Fish wheels are a legal subsistence gear type throughout the Yukon drainage, although due to river conditions and the availability of wood for building materials, they are used almost exclusively on the middle and upper Yukon and Tanana rivers.

Depending on the area of the Yukon River drainage and each salmon species' run timing, subsistence fishing for salmon occurs from late May through mid-October. Subsistence harvesters usually base their fishing activities either from fish camps or from their home communities. Extended family groups, typically representing several households, often participate in subsistence salmon fishing together. Households and related individuals often cooperate to harvest, process, preserve, and store salmon for subsistence uses.[1]

The majority of the subsistence salmon harvest is preserved for later uses by freezing, drying, or smoking; the head, viscera, backbones, and other scraps are often fed to dogs. Chinook salmon are harvested and processed primarily for human consumption, although those fish deemed not suitable for human consumption due to the presence of the fungus *Ichthyophonus hoferi* or some other disease or abnormality are often fed to dogs. Small male Chinook salmon ("jacks") or spawned-out salmon may also be fed to dogs. In addition, while fishers harvest chum and coho salmon primarily for human consumption, dog mushers harvest and process relatively large numbers of these species as food for sled dogs. Fall chum salmon and coho salmon typically arrive in the upper portion of the drainage late in the season, coinciding with freezing weather, during which time some dog mushers "crib" salmon for use as dog food. This method involves storing whole salmon outdoors in large wooden boxes or log cribs in late fall, and allowing them to freeze (Andersen 1992). The practice of keeping sled dogs is much more common in communities along the upper Yukon River than in the lower river area.

REGULATIONS

Regulation and management of Yukon River drainage subsistence salmon fishing follows the Yukon River Drainage Subsistence Salmon Fishery Management Protocol, which provides a framework for coordinated subsistence fisheries management between ADF&G and the federal subsistence management programs in the Yukon River drainage. This protocol is applied through a Memorandum of Agreement between state and federal agencies which formalizes the working relationships between state and federal managers and fosters cooperation with federal regional advisory councils and fisheries interest groups. State managers are responsible for management of state subsistence, commercial, recreational, and personal use fisheries in all waters. Federal managers are responsible for management of subsistence fishing by qualified rural residents in applicable federal waters. The protocol also directs state and federal managers to solicit input from the Yukon River Drainage Fisheries Association (YRDFA), the Yukon

1. For more detail on subsistence uses of Yukon River salmon, see ADF&G 1987a–b, 1988.

River Coordinating Fisheries Committee (YRCFC), and other stakeholders during the decision-making process.

The majority of the United States' portion of the Yukon Area is open to subsistence fishing. However, the Alaska Joint Board of Fisheries and Game has defined a portion of the Tanana River in the Yukon River drainage as lying within the Fairbanks Nonsubsistence Area (5 AAC 99.015). Subsistence fisheries may not be authorized within nonsubsistence areas; the harvest of fish for home uses in these nonsubsistence areas occurs under personal use and sport fishing regulations.

While the regulatory authority for Yukon River salmon management is shared by the Federal Subsistence Board (FSB) and the State of Alaska Board of Fisheries (BOF), Yukon River salmon fisheries are also managed in accordance with the Pacific Salmon Treaty. The Yukon River Panel, a board of appointed members from both Alaska and Canada, meets twice a year to negotiate annual aspects of the treaty, such as escapement goals and border passage goals, and to approve funding of scientific research addressing salmon biology and use patterns.

Over the last 2 decades, several regulatory changes have affected the subsistence salmon fishery in the Yukon River drainage. In 1993, the BOF adopted regulations that separated subsistence and commercial salmon fishing times in districts 1, 2, and 3 and in the lower portion of District 4 (Subdistrict 4A) (Figure 4-1). In these areas, subsistence salmon fishing is allowed 7 days per week but may not occur 24 hours prior to and immediately following the commercial salmon fishing season. By regulation, once the commercial season is open, subsistence salmon fishing may not occur 18 hours immediately before, during, and 12 hours after each district 1, 2, or 3 summer season commercial fishing period unless altered by emergency order. During the fall season in districts 1, 2, and 3, subsistence fishing may not occur 12 hours immediately before, during, and 12 hours after each commercial fishing period. In areas including and upriver from subdistrict 4B, subsistence salmon fishing periods coincide with commercial salmon fishing periods. Since 1988, subsistence fishing in the lower Tanana River drainage in subdistricts 6A and 6B has been allowed for two 42-hour periods per week unless altered by emergency order.[2] In the upper Tanana River drainage upstream of the Volkmar (north bank) and Johnson (south bank)[3] rivers, subsistence fishing is allowed 7 days per week.

Since 1996, Yukon River salmon stocks have fluctuated in terms of abundance. The disastrous runs of all species in 2000 resulted in subsistence restrictions late in the summer subsistence salmon season to protect Chinook salmon and summer chum salmon populations. Because of the inability to maintain expected yields and harvestable surpluses above escapement goals for several years, the BOF classified the Yukon River Chinook salmon stock as a stock of yield concern at its September 2000 work session (Lingnau and Salomone 2003). Fall chum salmon returns have also been variable over time. Restrictions on subsistence fall season salmon fishing occurred intermittently throughout the 1990s. There was a complete closure of the fall season in 2000 severely affecting the subsistence harvest of fall chum and coho salmon. In 2001 the BOF declared Yukon fall chum salmon a stock of concern.

Also in 2001, as a result of the disastrous runs the year before, the BOF instituted a new subsistence schedule on the Yukon River based on historical subsistence fishing opportunities structured around commercial openings, commonly referred to as the "windows" schedule. The schedule was intended to fulfill several goals: 1) increase the quality of escapement, 2) distribute subsistence opportunity among users during years with no commercial fishing, and 3) reduce the impact of harvest on any one stock by

2. In the lower Tanana River drainage, the fishery to harvest salmon for home uses in Subdistrict 6C is a personal use fishery. Its fishing schedule matches those of the 6A and 6B subsistence salmon fisheries; namely, that personal use fishing is allowed for two 42-hour periods per week unless altered by emergency order. In that portion of Subdistrict 6B from the downstream side of the upper Tolovana River to 3 miles upstream of Totchaket Slough (the Old Minto area), subsistence fishing is allowed 5 days per week.
3. Salmon fishing is closed in that portion of the Tanana River drainage upstream of Subdistrict 6C, from the Salcha River upstream to the Volkmar River (north bank) and to the Johnson River (south bank). The area is closed to salmon fishing other than sport fishing and is included in the Fairbanks Nonsubsistence Area. Whitefishes and longnose suckers may be harvested upstream of the Salcha River under a personal use permit.

spreading the harvest throughout the run, thereby providing windows of time that salmon may migrate upriver with reduced exploitation. The schedule, based on past fishing schedules, is initiated each year based on the historical average time of Chinook salmon entry into the Yukon River. Once initiated, the schedule is implemented chronologically upriver. The BOF determined that the schedule provides reasonable opportunity for subsistence users to achieve their harvest goals when salmon runs are below average. Subsistence fishing is allowed 7 days per week in all areas prior to the established schedule dates. In 2003, the BOF clarified the window schedule to allow ADF&G to relax the schedule if Chinook salmon run abundance allowed commercial fishing.

In 2005, the Federal Subsistence Board (FSB) established a subsistence drift gillnet fishery in subdistricts 4B and 4C, which includes the mainstem Yukon River villages of Galena and Ruby. Participation in this fishery was open to qualified rural residents under a federal subsistence permit, and limited to gillnets that were no longer than 150 ft and no deeper than 35 meshes. The mesh size was unrestricted so as to target Chinook salmon. In previous years, the regulation allowed drift gillnet fishing in the last 18 hours of each subsistence salmon fishing opening in the federal public waters of subdistricts 4B and 4C. However, in 2008, the FSB liberalized the regulation to align it with the regulatory openings, usually two 42-hour periods per week.

After a modest increase in Chinook salmon abundance from 2004 to 2007, more severe restrictions were imposed on the summer season to protect declining Chinook salmon runs beginning in 2008. Restrictions have been implemented through both period closures and limited gear use in all districts. During both its January 2010 and 2013 meetings in Fairbanks, the BOF continued the stock of yield concern designation for Yukon River Chinook salmon.[4] However, the returns of fall chum rebounded after 2007 and the BOF lifted the stock of concern designation.

In 2011 area managers implemented a 2010 Board of Fisheries decision to reduce the maximum stretched mesh net size to 7.5″. Prior to this, Yukon Area fishers widely used 8″–8.5″ mesh nets to target Chinook salmon. This change was considered a conservation tool to allow more of the older and larger Chinook salmon, especially females, to escape to the spawning grounds. During the spring of 2011, in cooperation with the Pacific States Marine Fisheries Commission (PSMFC), the Tanana Chiefs Conference (TCC) administered a net exchange program to help fishermen comply with this new regulation. Eligible fishermen could send in their 8″ or larger mesh nets in exchange for new, 7.5″ mesh nets (Frothingham 2011). Kwik'pak Fisheries, LLC, a community-based economic development organization in the lower Yukon River, also facilitated a net exchange program in lower river communities. However, restrictions in the subsistence fisheries necessary for conservation in the following years (discussed below) have kept fishermen from actually using these new nets to date.

At their 2013 meeting, the BOF required first pulse protection, or the prohibition of fishing on the first Chinook salmon pulse entering the river, in order to account for the uncertainty in the preseason Chinook salmon run projection and to protect the continued low runs. This prohibition may be relaxed in districts 3–6 if run assessment information suggests sufficient abundance. During the 2013 meeting, the BOF also prohibited the sale of Chinook salmon incidentally caught during directed summer chum commercial openings when subsistence salmon fishing is restricted (5AAC 05.360(i)).

Preseason outlooks for 2015 projected a poor to below average Chinook salmon run (118,000-140,000) (JTC 2016:3), especially for Canadian-origin fish. In an effort to gather input from fishermen and other stakeholders, YRDFA held an annual meeting with U.S. management agencies including ADF&G and USFWS (JTC 2016:4). Together, managers and stakeholders developed several strategies to increase opportunities to harvest abundant summer chum salmon while avoiding the harvest of Chinook salmon and ensuring that adequate numbers of Chinook salmon reach their spawning grounds in Alaska and Canada. The 2015 subsistence fishing schedule for the Yukon Area is presented in Table 4-1. The 2015

4. Alaska Department of Fish and Game Division of Commercial Fisheries. "Yukon Area regulatory changes," news release, January 25, 2013. Accessed August 2014. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/245219141.pdf

Canada. The 2015 subsistence fishing schedule for the Yukon Area is presented in Table 4-1. The 2015 summer chum salmon run was expected to range from 1.8 to 2.4 million fish and provide for escapement, a normal subsistence harvest, and a surplus for commercial harvest. A projected run of 944,000 to 1,176,000 fall chum salmon was expected to provide for escapement, subsistence harvests, and a projected commercial harvest of 394,000 to 626,000 fish. Coho salmon runs were projected to be below average to average , based on average survival of the 2011 parent year (JTC 2016:64).

Throughout the season, emergency orders were issued to modify the subsistence fishing schedule to protect Chinook salmon. Ice breakup in the lower river occurred on May 18 and 19, which was a week earlier than the average of May 25, and the first Chinook salmon was reportedly caught on May 27 (JTC 2016:7). The first Chinook salmon caught in the Lower Yukon Test Fishery (LYTF) occurred on May 28 (JTC 2016:7). Consistent with the regulatory requirement to close fishing on the first pulse of Chinook salmon for conservation purposes, subsistence closures were initiated in District 1–3 and the northern portion of the Coastal District on May 30 and implemented chronologically upriver as the pulse migrated. As the Chinook salmon migration progressed upriver, inseason assessment projects indicated that the run was better than anticipated but was still a below average run. In an effort to provide some subsistence and commercial fishing opportunity for summer chum salmon, managers allowed fishing between Chinook salmon pulses with selective fishing gear to target abundant summer chum salmon and nonsalmon species while still protecting Chinook salmon. During these openings, commercial fishermen were allowed to use dip nets and beach seines, releasing all Chinook salmon alive. Once the first pulse of Chinook salmon migrated past District 4 subsistence and commercial opportunity for summer chum was provided for District 4 fishermen with fish wheels and dip nets with the requirement that all Chinook salmon be released alive. Fishermen could use dip nets and fish wheels with the stipulation that all Chinook salmon would be released back to the water unharmed. Subsistence closures were most pronounced in Subdistrict 5-D where very few summer chum migrate and where the closures were necessary to ensure Chinook salmon passage into Canada (JTC 2016:7).

During the preseason, it was considered unlikely that there would be a directed commercial Chinook salmon fishery given previous years' failures to meet minimum treaty escapement goals for Canadian Chinook salmon and because of the likely restrictions on the subsistence fishery. Ultimately, given the need for subsistence restrictions indicated by the preseason outlook and early inseason indicators, ADF&G did not authorize any commercial fishing periods targeting Chinook salmon on the mainstem Yukon River.

The preseason outlook projected the 2015 summer chum run to be average, to provide for escapement and subsistence uses, and to have a surplus for commercial harvest, noted above. A harvestable surplus of summer chum has been available for the last 10 years (2005–2014). Because of the concurrent run timing of Chinook and summer chum salmon, managers expected that the conservative management strategies, designed to protect a poor Chinook salmon run, would affect and reduce the commercial harvest of summer chum salmon. Ultimately, the sonar at Pilot Station estimated the passage of summer chum at approximately 1.4 million fish in 2015, which is below the historical median (JTC 2016:8). To reduce the incidental catch of Chinook salmon in the summer chum commercial fishery, commercial fishing was delayed until the first pulse of Chinook salmon run had passed through the Lower Yukon Area. Additionally, managers implemented regulations adopted by the BOF in 2013 that allowed the commercial harvest of summer chum salmon using dip nets and beach seines beginning on June 11 in Districts 1 and June 15 in District 2. Fishermen were required to immediately release incidentally caught Chinook salmon. Subsistence and commercial fishing periods were scheduled concurrently to reduce the time Chinook salmon were susceptible to harvest. However, short subsistence only opportunity was allowed in the mornings prior to commercial fishing opportunity and all day on Saturdays to give subsistence fishermen less competitive opportunity to harvest summer chum salmon. In 2015, no commercial fishing occurred in District 4 because there was no operational buyer (JTC 2016:9). A total of 9,500 Chinook salmon were reported caught and released back to the water alive. A total of 3,372

Chinook salmon were incidentally harvested and reported as caught but not sold during commercial chum salmon openings (JTC 2016:13).

The preseason outlook for fall chum salmon estimated a return of greater than 700,000 fish, enough to meet the escapement goal and provide for subsistence harvests, and support a commercial harvest.[5] By regulation the fall season begins in District 1 on July 16. In 2015 the sonar near Pilot Station began counting chum salmon as fall chum salmon on July 19. The sonar near Pilot Station began counting fall chum on July 19 and all districts and subdistricts were placed on their full regulatory subsistence fishing schedules. The largest pulse of fall chum salmon passed the mainstem sonar site at Pilot Station by July 22 (JTC 2016:11). A directed commercial fall chum salmon fishery resulted in a harvest of 191,470 chum salmon. This harvest was above the most recent 5-year (2010–2014) and 10-year (2005–2014) averages. The coho salmon passage past the Yukon River sonar near Pilot Station was the highest on record. In addition to the coho salmon caught in the fall chum salmon commercial fishery, ADF&G identified a surplus of coho salmon and opened a coho salmon commercial fishery in District 1 from September 1 through September 5. A total of 446 permit holders participated in the fall season salmon commercial fishery; 440 in districts 1 and 2and 6 in districts 4 through 6.[6] Participation in lower river districts during the 2015 fishing season was well above historical averages while participation in the upper river districts was lower than historical averages (JTC 2016:13).

SUBSISTENCE HARVEST ASSESSMENT METHODS

For the majority of villages within the Yukon Area, there are no regulatory requirements to report subsistence salmon harvests. For these villages, ADF&G utilizes a voluntary survey program to estimate the total subsistence salmon harvest. Harvest information is collected using a combination of subsistence harvest calendars mailed prior to fishing activities and postseason surveys conducted in person or by phone or letter. In road-accessible portions of the Yukon Area—including the majority of the Tanana River drainage (subdistricts 6A and 6B and the Upper Tanana River drainage), the Yukon River drainage between Hess Creek and the Dall River (known as the Yukon River Bridge Area), the upper portion of Subdistrict 5D between the upstream mouth of Twenty-two Mile Slough and the U.S.–Canada border, and, as of 2004, the Rampart Area (western end of Garnet Island to the mouth of Hess Creek), and the Middle and South Fork Area of the Koyukuk River—subsistence fishers are required to obtain an annual household permit prior to fishing, document their subsistence salmon harvests on the household permit, and return it to ADF&G at the end of the season.

Prior to salmon fishing activities, subsistence harvest calendars are mailed to all identified fishing households within the survey communities. The Lower Yukon Area calendars contain the months of May through September and the Upper Yukon Area calendars contain the months of June through October. Additional calendars are mailed to those households for which fishing activities are unknown and are also made available to households upon request from ADF&G offices in Emmonak and Fairbanks. The calendars provide space for fishers to record their daily subsistence harvests of salmon by species. Calendars are return-postage-paid and are mailed to ADF&G or given to ADF&G research staff during postseason trips to the villages, especially during the postseason salmon survey. Posters sent to village post offices and announcements on area radio stations remind fishers to give their calendars to research staff. In 2015, Division of Commercial Fisheries staff distributed calendars to all households identified as participating in some level of fishing or with unknown fishing harvests; households identified as nonfishing households did not receive calendars. A total of 1,768 calendars were sent to Yukon River households. Approximately 14% of calendar recipients (251) returned harvest calendars either by mail or

5. Alaska Department of Fish and Game Division of Commercial Fisheries. "2015 Preliminary Yukon River Summer Season Summary," news release, December 10, 2015. Accessed May 2017. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/633559108.pdf
6. Alaska Department of Fish and Game Division of Commercial Fisheries. "2015 Yukon River Fall Season Summary," news release, December 10, 2015. Accessed May2017.. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/633559108.pdf

through research staff during their fall surveys. Calendars provide additional Yukon Area run and harvest timing information that is not obtained by other data collection methods (Jallen et al. 2017).

In addition to the harvest calendars, ADF&G Division of Commercial Fisheries staff conduct postseason in-person interviews with a stratified random sample of all households in surveyed communities within the Yukon River drainage. Survey questions focus on Chinook, summer chum, fall chum, and coho salmon, but households are also asked about other species as well, such as pink salmon (primarily taken by coastal communities), northern pike *Esox lucius*, whitefishes, and sheefish. Some households that are not contacted in person by the surveyors are contacted by telephone. Those households not contacted by telephone are mailed a survey questionnaire and a postage-paid return envelope.

A subsistence permit is required in the road-accessible portions of the Yukon River drainage. Subsistence fishers record their daily salmon harvests on a household permit and return the permit within 10 days of the expiration date on the permit. Subsistence permit applications are mailed to all who returned the prior year's permit, along with instructions on how to apply by mail. In addition, ADF&G staff travel to select villages so that applicants can be issued permits in person. Permits are also issued in several ADF&G offices or by mail throughout the season. Those who do not return permits are sent up to 2 reminder letters. Telephone contacts with households that do not respond to the reminder letters are attempted as a final measure.

Subsistence salmon permit holders in a portion of Subdistrict 6B (the Tanana River drainage above a point 3 miles upstream of Totchaket Slough to the boundary with Subdistrict 6C) and the personal use fishers in Subdistrict 6C are required to report their harvests weekly for inseason management purposes. To maximize the return of permits, ADF&G staff also sent reminder letters to these households. A total of 418 salmon fishing permits were issued to households in the Yukon Area in 2015, including 354 subsistence and 64 personal use permits (Table 4-2). Of these permits, 352 (99%) subsistence permits and 64 (100%) personal use permits were returned to ADF&G (Table 4-2). Unreturned permits were considered to be unfished, and subsistence fishing households are not eligible to receive a permit the following year until the previous year's permit is returned.

Department staff surveyed 1,151 households in the Yukon Area concerning their subsistence salmon harvests in 2015 (Table 4-3).

SUBSISTENCE SALMON HARVESTS IN 2015

In 2015, 1,151 surveyed households (42% of the total households in surveyed communities) and 416 permit holders that returned permits provided harvest data for the Yukon Area subsistence–personal use salmon fishery (Table 4-2; Table 4-3). The estimated subsistence–personal use salmon harvest for the entire Yukon Area included 7,582 Chinook salmon (4% of the estimated total salmon harvest), 83,787 summer chum salmon (42%), 86,680 fall chum salmon (44%), 18,252 coho salmon (9%), and 2,645 pink salmon (1%), for a total of 198,946 salmon (Table 4-4; Figure 4-2). Note that this is an estimated total based on household surveys and returned permits and calendars, and it includes subsistence harvests, personal use harvests, commercial harvests retained for subsistence, and fish distributed from ADF&G test fisheries.

Since the disastrous harvest levels in 2000 (152,300 total salmon), subsistence salmon harvests have fluctuated by species. Chinook salmon harvest levels have remained relatively stable except in years when conservative management actions were taken. As shown in Table 4-5, the 2015 Chinook salmon harvest estimates were below the most recent Yukon Area 5-year averages (2010–2014), likely reflecting the restrictions put in place to protect them. The estimated subsistence and personal use harvest of 7,582 Chinook salmon in 2015 was 71% below the most recent 5-year average of 26,428 fish, and 79% below the most recent 10-year average of 36,890 fish. Other explanations for decreases in Chinook harvest include voluntary reduction of harvest by Yukon River communities and individual households. Regardless, subsistence Chinook salmon harvests have not fallen within the amounts necessary for

subsistence (ANS) range for the last 8 years (2008–2015). In response to reduced Chinook salmon harvests, many households may try to replace some of their Chinook harvest with other, more abundant, salmon species. For example, in years when Chinook salmon harvests drop to record lows, the harvest of summer and fall chum salmon often increase. However, in 2015 the harvest of summer chum salmon fell below the last 5- and 10-year averages. Conservation measures to protect Chinook salmon likely had an effect on the harvest of summer chum salmon, since the two species co-migrate. The harvests of both fall chum and pink salmon in 2015 were lower than their respective 5-year and 10-year averages. The 2015 harvest of coho salmon was slightly higher than the 5-year average and the 10-year average.

Until 1996, when the market for chum salmon roe declined, subsistence harvests of summer chum salmon were regularly estimated between 115,000 and 142,000 fish. Fishers harvested summer chum salmon for roe and kept most of the carcasses primarily for dog food; these fish were counted in the subsistence harvest. After 1996, the harvest of summer chum steadily fell, dropping from 124,738 fish in 1996 to a low of 72,392 in 2001. Since then, summer chum harvests have been relatively stable. The estimated 2015 subsistence harvest of 83,787 summer chum salmon was 19% below the 5-year average of 102,970 fish and 15% below the 10-year average of 98,419 fish. While the harvest of summer chum salmon was lower in 2015 than in recent years, they may play a larger role in subsistence salmon harvests if Chinook salmon harvests continue to decline as subsistence users attempt to adapt to changes in Chinook salmon availability.

Fall chum salmon harvests steadily declined in the late 1980s through the 1990s (Figure 4-3). Since then, harvest has fluctuated. Unlike summer chum, fluctuations in harvest are less connected to the commercial market. Fall chum salmon are used as both human food and dog food, depending on quality and timing of harvests within the run. Historically, due to run timing, the management of coho salmon has been tied to the management of fall chum salmon. As such, it is difficult to assess actual trends in the harvest of coho salmon and reasons for these trends.

Pink salmon are on the calendar and survey for the entire survey area, but harvest is typically only reported in lower river communities. Although pink salmon can be abundant in lower Yukon River and coastal Yukon River delta communities, fishers do not typically harvest large numbers of this species.

Figure 4-4 shows the number of dogs reported by surveyed households in each fishing district, as well as the percentage of total dogs in the Yukon Area reported in each district. Of the estimated 1,795 households in the Yukon Area that own dogs, about 6% (99 households) fed whole salmon to their dogs in 2015 (Jallen et al. 2017). Most households that own dogs feed fish scraps but do not harvest salmon to feed to dogs. Of the 5,175 dogs owned by Yukon Area households in 2015, upper Yukon households in districts 4, 5, and 6 owned 3,087 dogs (60% of the total number of dogs owned in Yukon River districts) (Figure 4-4). In 2015, the Division of Commercial Fisheries collected information on the number of each of the 4 species of salmon that fishers retained for dog food from subsistence harvests in surveyed communities. In permit communities, only the total number of whole salmon, and not the numbers of each species, was documented. In the Coastal District and in districts 1 through 5, an estimated 7,848 summer chum salmon, 24,184 fall chum salmon, and 3,064 coho salmon were retained for dog food from subsistence salmon harvests. Additionally, permit holders in Y-5 and Y-6 fed 29,259 whole salmon to dogs (Jallen et al. 2017).

Primary gear types used by Yukon Area fishing households in 2015 included set gillnet (46%), drift gillnet (48%), and fish wheel (6%) (Figure 4-5), largely the same as the last several years.

From 1992 through 2013, ADF&G asked surveyed households whether they were able to meet their subsistence salmon needs for each survey year. The disastrous fishing year in 2000 resulted in restrictions and closures in subsistence salmon fishing schedules and made it extremely difficult for fishing families to meet their needs (64% of surveyed households reported not meeting their needs in 2000) (Borba and Hamner 2001:98). In 2003, ADF&G began asking households to describe whether they met their subsistence needs for each species of salmon, measuring responses by community and by species.

Specifically, surveyed households were asked whether 100%, 75%, 50%, or less than 25% of their harvest needs were met for each species. Two checkboxes, "0%" and "no need," were added to the 2005 survey in order to distinguish those who had a need but no success in harvesting a species from those who had no need and therefore did not harvest any fish. Beginning in 2014 the Division of Commercial Fisheries no longer is reporting data on whether households met their subsistence needs. Historic needs met data can be found in prior issues of this report.

In 1993, the BOF made a positive C&T use finding for all salmon in the Yukon–Northern Area. The ANS determination was established at 348,000–503,000 salmon for all species combined (5 AAC 01.236). Under these guidelines, 1992 marked the last year when total subsistence salmon harvests fell within the combined ANS range. Since 1990, the overall total subsistence salmon harvest in the Yukon Area has declined by approximately 45% (Table 4-5). In 2001, the BOF made species-specific ANS determinations for each of 4 species of salmon harvested in the Yukon Area, including separate ANS determinations for summer chum salmon and fall chum salmon. In 2013, the BOF added an ANS for pink salmon, 2,100–9,700 fish. The ANS range provides one index of the extent to which reasonable opportunity is provided in each subsistence fishery. Harvests below the lower bound of the ANS range may indicate, with other evidence, that there was not a reasonable opportunity for subsistence harvests during the previous season. Harvests consistently below the lower bound of the ANS are an indication to the BOF to consider whether additional management actions are necessary to provide reasonable subsistence opportunities or if harvest and use patterns for a species have changed over time such that harvests fall outside of ANS ranges. For the eighth year in a row Chinook salmon harvests fell below the minimum bound of the ANS range (Table 4-6). Summer chum salmon harvest remained within the ANS range for the sixth year in a row while fall chum salmon harvest fell below the lower bound of the ANS range for the first time in four years and the 6th time in 10 years. Declines in the number of dog teams along the river, the abundance of fall chum salmon, and the reductions in harvest opportunity for Chinook salmon likely contribute to the fluctuations in fall chum harvest. Similar to prior years, the harvest of coho salmon (18,252 fish) was below the minimum bound of the ANS range (20,500 fish). See Table 4-6 for a comparison of ANS ranges and subsistence salmon harvests from 1998–2015.

NONSALMON FISH HARVESTS

Although salmon harvests dominate most of the regulatory actions in the Yukon Area, nonsalmon fish harvests remain significant components of the seasonal subsistence round for Yukon Area fishers. Salmon are only available seasonally, but most nonsalmon species are available year-round. Nonsalmon fishes not only provide an important source of nutrition for residents of the Yukon Area, they also represent a significant cultural resource for subsistence fishers in the region. In 1987, and again in 1993, the BOF made a positive C&T use determination for freshwater fish species in the Yukon Area, including sheefish, whitefish species, Arctic lamprey, burbot, longnose sucker, Arctic grayling, northern pike, and Arctic char (5 AAC 01.236). Subsistence fishing for nonsalmon species is generally open by regulation 7 days per week, 24 hours per day, year-round. These state regulations also apply to subsistence fisheries in waters adjacent to federal lands in the project study area (unless superseded on federal public lands by federal subsistence regulations, applicable only to federally qualified subsistence users). Under federal regulations established by the Federal Subsistence Board, rural Alaskan residents of the Yukon–Northern Area (except those living in ADF&G Game Management Unit 26B) and residents of the Yukon River drainage have a positive C&T use determination for nonsalmon fishes, and are qualified to participate in subsistence activities on federal public lands, even if other uses and/or users have been prohibited from subsistence fishing in federal waters due to conservation concerns or user conflicts.[7]

ADF&G Division of Commercial Fisheries collects nonsalmon harvest data on an annual basis as part of a postseason salmon survey; however, collection of nonsalmon harvest data is not the primary purpose of

7. USFWS. 2008. Subsistence management regulations for the harvest of fish and shellfish on federal public lands and waters in Alaska, effective April 1, 2008–March 31, 2009. U.S. Fish and Wildlife Service, Anchorage, Alaska.

the postseason subsistence salmon harvest survey. Furthermore, the implementation of this survey immediately following the salmon fishing season may not be timed to produce the most accurate results for nonsalmon harvests, nor is the stratified sample of salmon fishing households necessarily the best design for collecting nonsalmon harvest information. However, while other single-year harvest data collection efforts suggest that the postseason survey may significantly underestimate harvests (Andersen et al. 2004; Brown et al. 2005), these data have value as the only annual estimate of nonsalmon fish harvests in the Yukon Area (Table 4-7).

Table 4-7 estimate harvests of whitefish, sheefish, and northern pike by community. In 2015 Yukon Area fishers from districts 1–5 harvested a total of 112,677 of these nonsalmon fish (Table 4-7). This represents a considerable increase since 2010 when the total harvest of these species was 73,524 fish, and even an increase over 2012 harvests of 106,030 fish (Fall et al. 2013, 2014). The "large whitefish" category includes broad and humpback whitefishes while the "small whitefish" category includes least and Bering cisco species and round whitefish. Fishers in District 1 harvested the most nonsalmon fishes (28,432 fish), followed by District 2 (23,999 fish). On a drainagewide level, large whitefish species were harvested in greater numbers than any other nonsalmon fish and made up 36% of the total nonsalmon harvest. Approximately 11,342 large whitefishes, or 28% of the total large whitefish harvest and 10% of the drainage wide nonsalmon harvest, were harvested by Yukon River fishers from District 5. Fishers in districts 1 and 4 harvested the greatest number of small whitefish (14,910 and 9,330 fish, respectively). It is important to note that these totals do not include harvests from District 6 along the Tanana River; data there are not reported by large and small categories. Fishers from districts 1–5 reported harvesting 20,109 northern pike and 12,828 sheefish in 2015. District 2 harvested far more northern pike than any other district (9,183 fish). District 1 harvested more nonsalmon fish than any other district (28,432 fish). District 2 followed with 23,999 nonsalmon fish. Permit fishers, primarily along the Tanana River and a few other locations along the Yukon River reported an additional harvest of 3,771 whitefish, 891 northern pike, and 166 sheefish (Jallen et al. 2017).

The Division of Subsistence has conducted numerous subsistence surveys along the Yukon River over time. Since 2008 for example, comprehensive surveys that included questions on nonsalmon species have been administered in Emmonak (Fall, Brown, et al. 2012); Galena, Nulato, Ruby, Marshall, and Mountain Village (Brown et al. 2015); Anvik, Grayling, and Russian Mission (Ikuta et al. 2014); Shageluk and Pilot Station (Ikuta et al. 2016), Minto and Manley Hot Springs (Brown et al. 2014); and Tanana, Stevens Village, and Rampart (Brown et al. 2016). Additionally, studies on the traditional ecological knowledge of nonsalmon have been conducted in the middle Yukon River communities of Tanana, Ruby, Galena, Nulato, and Kaltag, and the Yukon Flat communities of Beaver, Birch Creek Village, Central, Circle, and Fort Yukon (Brown et al. 2010; Koskey and Mull 2011). A 2005 study explored the contemporary use of nonsalmon in the lower middle Yukon River communities of Grayling, Anvik, Shageluk, and Holy Cross (Brown et al. 2005). Information on historical and contemporary harvest and use of nonsalmon in communities along the Yukon River, where data are available, can be accessed through the Community Subsistence Information System (CSIS) on the ADF&G website.

THE ROLE OF SALMON WITHIN ANNUAL SUBSISTENCE HARVESTS

Considering salmon within the context of total subsistence harvests provides a true measure of the importance of the resource and the extent to which declines in Chinook salmon specifically affect rural communities. In addition to post-season salmon surveys conducted by ADF&G, Division of Commercial Fisheries staff, Division of Subsistence staff have conducted comprehensive subsistence surveys in 17 Yukon River communities since 2010 (Brown et al. 2013, 2015; Ikuta et al. 2016). In all communities, salmon was a primary subsistence resource, accounting for an average of 41% of total community subsistence harvests by edible weight and was used by the majority of Yukon River households.

In 2014, residents of Scammon Bay, located in the Coastal District, Pilot Station, in District Y2, and Shageluk, in District Y3, participated in comprehensive subsistence surveys. In 2014, fish was among the

most widely harvested resource category of wild foods in each study community, making up the bulk of the community harvest by edible weight: 34% in Pilot Station, 45% in Scammon Bay, and 66% in Shageluk. Of the fish harvested in each community, salmon made up the majority of that harvest and contributed nearly the same percentage to each community's total subsistence harvest by edible weight: 20% in Scammon Bay, 27% in Pilot Station, and 24% in Shageluk (Ikuta et al. 2016). Together, the three communities harvested an estimated 86,406 edible pounds of salmon.

In a continued attempt to protect declining numbers of Chinook salmon in the Yukon River, ADF&G implemented conservative management strategies in 2015. As discussed above, the 2015 harvest of Chinook salmon on the Yukon River was low, especially compared to recent prior years (7,582 fish compared to the most recent 10 year average of 36,890 Chinook salmon). Communities throughout the Yukon River drainage continued to experience extremely low Chinook salmon harvests in 2015. While the 2015 harvest of Chinook salmon was more than double the 2014 harvest, it was still significantly lower than historical averages. This year's harvest was 82% lower than the historical averages, based on harvest data from 1976 to 2014 (42,584 Chinook salmon). Ethnographic data gathered during recent comprehensive subsistence research concluded that these decreases in Chinook salmon harvest on the Yukon River were not reflective of a change in social or cultural significance, dietary preferences, or interest in Chinook salmon fishing. Instead, the reduction in harvest was generally considered a sacrifice to support future production and recovery that should not be understated.

Table 4-1.–Yukon area fishing schedule, 2015.

Area	Regulatory subsistence fishing periods	Open fishing times
Coastal District	7 days per week	M/T/W/TH/F/SA/SU - 24 hours/day
District 1	Two 36-hour periods per week	Mon 8 pm to Wed 8 am / Thu 8 pm to Sat 8 am
District 2	Two 36-hour periods per week	Wed 8 pm to Fri 8 am / Sun 8 pm to Tue 8 am
District 3	Two 36-hour periods per week	Wed 8 pm to Fri 8 am / Sun 8 pm to Tue 8 am
District 4	Two 48-hour periods per week	Sun 6 pm to Tue 6 pm / Wed 6 pm to Fri 6 pm
Koyukuk and Innoko rivers	7 days per week	M/T/W/TH/F/SA/SU - 24 hours/day
Subdistricts 5-A, -B, -C	Two 48-hour periods per week	Tue 6 pm to Thu 6 pm / Fri 6 pm to Sun 6 pm
Subdistrict 5D	7 days per week	M/T/W/TH/F/SA/SU - 24 hours/day
Subdistrict 6	Two 42-hour periods per week	Mon 6 pm to Wed Noon / Fri 6 pm to Sun Noon
Old Minto Area	5 days per week	Friday 6 pm to Wednesday 6 pm

Source JTC 2016

Note This schedule was subject to change depending on run strength.

Table 4-2.–Household subsistence and personal use permits, listed by fishery and community of residence, Yukon Area, 2015.

Community	Permits		Percent returned	Number of permits returned that fished
	Issued	Returned		
Subsistence permits				
Central	6	6	100%	3
Circle	18	17	94%	10
Eagle	22	22	100%	15
Rampart	4	4	100%	3
Fairbanks (FNSB)[a]	174	174	100%	90
Healy	3	3	100%	2
Manley	12	12	100%	9
Minto	32	32	100%	8
Nenana	36	35	97%	16
Stevens Village	1	1	100%	0
Upper Tanana Villages[b]	37	37	100%	14
Other Subsistence[c]	9	9	100%	5
Subsistence permit total	**354**	**352**	**99%**	**175**
Personal use permits				
Fairbanks (FNSB)[a]	56	56	100%	21
Other personal use[d]	8	8	100%	7
Personal use permit subtotal	**64**	**64**	**100%**	**28**
Total	**418**	**416**	**99%**	**203**

Source Jallen et al. (2017)

a. Fairbanks North Star Borough (FNSB) residents from the communities of Ester, Fairbanks, North Pole, Salcha, and Two Rivers.

b. Includes residents from Delta Junction, Dot Lake, Northway, Tanacross, and Tok who were issued a subsistence fishing permit and fished in the Tanana River.

c. Other Subsistence represents residents from Anchorage and Eagle River, Tanana, Wasilla, and Wiseman who were issued a subsistence fishing permit for Yukon, Tanana, Tolovana, Kantishna, and upper Koyukuk rivers.

d. Other Personal Use includes residents from Anchorage, Delta Junction, and Nenana who were issued a personal use permit.

Table 4-3.–Estimated number of subsistence fishing households in surveyed communities, with community and district totals, Yukon Area, 2015.

Community	Households		Estimated number of fishing households
	Total	Surveyed	
Hooper Bay	222	93	112
Scammon Bay	119	51	84
Coastal District subtotal	**341**	**144**	**196**
Alakanuk	142	58	83
Emmonak	189	94	102
Kotlik	124	54	97
Nunam Iqua	42	25	25
District 1 subtotal	**497**	**231**	**307**
Marshall	105	37	50
Mountain Village	170	60	104
Pilot Station	121	61	60
Pitkas Point	33	23	18
St Marys	135	55	87
District 2 subtotal	**564**	**236**	**319**
Holy Cross	64	34	22
Russian Mission	76	31	53
Shageluk	25	16	8
District 3 subtotal	**165**	**81**	**83**
Alatna	7	4	2
Allakaket	54	16	20
Anvik	32	23	14
Bettles	28	10	0
Galena	146	49	41
Grayling	54	23	25
Hughes	33	30	2
Huslia	87	35	20
Kaltag	54	19	25
Koyukuk	45	11	22
Nulato	80	38	32
Ruby	64	22	13
District 4 subtotal	**684**	**280**	**216**
Beaver	25	16	5
Birch Creek	13	7	0
Chalkyitsik	33	19	2
Fort Yukon	223	71	38
Stevens Village	8	1	0
Tanana	96	42	28
Venetie	74	23	12
District 5 subtotal	**472**	**179**	**85**
Total	**2,723**	**1,151**	**1,206**

Source Jallen et al. (2017)

Table 4-4.–Estimated subsistence salmon harvests by community, Yukon Area, 2015.

Community	Households or permits		Estimated salmon harvest[a]					
	Total	Surveyed or returned	Chinook	Coho	Summer chum	Fall chum	Pink	Total
Hooper Bay	222	93	534	95	11,870	79	451	13,029
Scammon Bay	119	51	432	79	8,598	119	1,414	10,642
Coastal District subtotal	**341**	**144**	**966**	**174**	**20,468**	**198**	**1,865**	**23,671**
Alakanuk	142	58	436	581	4,469	1,067	15	6,568
Emmonak	189	94	612	852	9,973	3,244	7	14,688
Kotlik	124	54	661	438	4,960	1,356	14	7,429
Nunam Iqua (Sheldon Point)	42	25	210	229	2,239	210	352	3,240
District 1 subtotal	**497**	**231**	**1,919**	**2,100**	**21,641**	**5,877**	**388**	**31,925**
Marshall	105	37	128	1,511	4,351	1,731	0	7,721
Mountain Village	170	60	370	723	6,063	1,398	57	8,611
Pilot Station	121	61	382	305	4,702	1,346	0	6,735
Pitkas Point	33	23	44	72	1,225	172	288	1,801
Saint Marys	135	55	261	391	8,216	1,611	18	10,497
District 2 subtotal	**564**	**236**	**1,185**	**3,002**	**24,557**	**6,258**	**363**	**35,365**
Holy Cross	64	34	68	246	421	763	0	1,498
Russian Mission	76	31	365	154	2,626	449	0	3,594
Shageluk	25	16	14	28	80	176	0	298
District 3 subtotal	**165**	**81**	**447**	**428**	**3,127**	**1,388**	**0**	**5,390**
Alatna	7	4	0	12	58	64	0	134
Allakaket	54	16	35	40	2,455	524	0	3,054
Anvik	32	23	58	46	777	680	0	1,561
Bettles	28	10	0	0	0	0	0	0
Galena	146	49	372	654	1,059	2,542	16	4,643
Grayling	54	23	22	212	509	1,184	0	1,927
Hughes	33	30	4	16	1,499	490	0	2,009
Huslia	87	35	34	294	3,110	736	0	4,174
Kaltag	54	19	119	18	216	1,255	0	1,608
Koyukuk	45	11	26	416	0	2,838	0	3,280
Nulato	80	38	33	48	6	2,248	0	2,335
Ruby	64	22	68	185	88	713	0	1,054
District 4 subtotal	**684**	**280**	**771**	**1,941**	**9,777**	**13,274**	**16**	**25,779**
Beaver	25	16	69	0	0	76	0	145
Birch Creek	13	7	0	0	0	0	0	0
Central	6	6	56	0	0	0	0	56
Chalkyitsik	33	19	0	0	0	171	0	171
Circle	18	17	129	0	0	1,652	0	1,781

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Table 4-4.–Page 2 of 2.

Community	Households or permits: Total	Households or permits: Surveyed or returned	Estimated salmon harvest[a]: Chinook	Coho	Summer chum	Fall chum	Pink	Total
Eagle	22	22	395	0	0	17,185	0	17,580
Fairbanks	230	230	301	3,253	967	6,030	0	10,551
Fort Yukon	223	71	480	2	0	6,257	0	6,739
Rampart	4	4	1	2	0	186	0	189
Stevens Village	9	2	0	0	0	0	0	0
Tanana	96	42	141	2,434	3,162	19,627	13	25,377
Venetie	74	23	308	24	0	2,423	0	2,755
District 5 subtotal	**753**	**459**	**1,880**	**5,715**	**4,129**	**53,607**	**13**	**65,344**
Healy	3	3	0	647	0	830	0	1,477
Manley	12	12	121	1,263	9	1,697	0	3,090
Minto	32	32	23	270	0	140	0	433
Nenana	36	35	263	2,712	60	3,151	0	6,186
District 6 subtotal	**154**	**151**	**894**	**6,474**	**884**	**12,619**	**0**	**20,871**
Other communities	54	54	7	0	19	260	0	286
Total	**3,141**	**1,567**	**7,582**	**18,252**	**83,787**	**86,680**	**2,645**	**198,946**

Source Jallen et al. (2017)

a. Includes subsistence harvests, personal use harvests, commercial harvests retained for home use, and fish distributed from ADF&G test fisheries.

Table 4-5.–Historical subsistence salmon harvests, Yukon Area, 1976–2015.

Year	Households or permits[a]		Estimated salmon harvest[a]					
	Total	Surveyed or returned	Chinook	Coho	Summer chum	Fall chum	Pink	Total
1976			17,530	12,737		1,375		31,642
1977			16,007	16,333		4,099		36,439
1978			30,785	7,965	213,953	95,532		348,235
1979			31,005	9,794	202,772	233,347		476,918
1980			42,724	20,158	274,883	172,657		510,422
1981			29,690	21,228	210,785	188,525		450,228
1982			28,158	35,894	260,969	132,897		457,918
1983			49,478	23,905	240,386	192,928		506,697
1984			42,428	49,020	230,747	174,823		497,018
1985			39,771	32,264	264,828	206,472		543,335
1986			45,238	34,468	290,825	164,043		534,574
1987			55,039	46,213	300,042	226,990		628,284
1988	2,700	1,865	45,495	69,679	229,838	157,075		502,087
1989	2,211	983	48,462	40,924	169,496	211,303		470,185
1990	2,666	1,121	48,587	43,460	115,609	167,900		375,556
1991	2,521	1,261	46,773	37,388	118,540	145,524		348,225
1992	2,751	1,281	47,077	51,980	142,192	107,808		349,057
1993	3,028	1,397	63,915	15,812	125,574	76,882		282,183
1994	2,922	1,386	53,902	41,775	124,807	123,565		344,049
1995	2,832	1,391	50,620	28,377	136,083	130,860		345,940
1996	2,869	1,293	45,671	30,404	124,738	129,258		330,071
1997	2,825	1,309	57,117	23,945	112,820	95,141		289,023
1998	2,986	1,337	54,124	18,121	87,366	62,901		222,512
1999	2,888	1,377	50,515	19,984	79,250	83,420		233,169
2000	3,209	1,341	36,844	16,650	77,813	19,402	1,591	152,300
2001	3,072	1,355	56,103	23,236	72,392	36,164	403	188,298
2002	2,775	1,254	44,384	16,551	87,599	20,140	8,425	177,100
2003	2,850	1,377	56,872	24,866	83,802	58,030	2,167	225,737
2004	2,721	1,228	57,549	25,286	79,411	64,562	9,697	236,506
2005	2,662	1,406	53,547	27,357	93,411	91,667	3,132	269,114
2006	2,833	1,473	48,682	19,985	115,355	84,320	4,854	273,196
2007	2,819	1,495	55,292	22,013	93,075	99,120	2,118	271,618
2008	3,030	1,664	45,312	16,905	86,652	89,538	9,529	247,936
2009	2,853	1,508	33,932	16,076	80,847	66,197	2,300	199,352
2010	3,066	1,659	44,721	14,107	88,692	71,854	4,199	223,573
2011	3,060	1,574	41,069	12,576	96,459	80,549	2,291	232,944
2012	3,133	1,575	30,486	21,633	127,313	99,719	5,150	284,301
2013	3,228	1,847	12,575	14,566	115,252	113,767	1,079	257,239

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Table 4-5.–Page 2 of 2.

Year	Households or permits[a] Total	Households or permits[a] Surveyed or returned	Estimated salmon harvest[a] Chinook	Coho	Summer chum	Fall chum	Pink	Total
2014	3,195	1,704	3,287	17,072	87,135	92,507	6,932	206,933
2015	3,141	1,567	7,582	18,252	83,787	86,680	2,645	198,946
5-year average (2010–2014)	3,136	1,624	26,428	15,991	102,970	91,679	3,930	240,998
10-year average (2005–2014)	2,988	1,567	36,890	18,229	98,419	88,924	4,158	246,621
Historical average (1976–2014)	2,878	1,416	42,584	26,172	147,073	112,125	4,258	322,049

Source Jallen et al. (2017)

a. Estimates prior to 1988 are based on fish camp surveys, and sampling information is unavailable. Cells that do not contain data have no data available.

Table 4-6.–Comparison of amounts necessary for subsistence (ANS) and estimated subsistence salmon harvests, Yukon Area, 1998–2015.

ANS range	Chinook 45,500–66,704	Coho 20,500–51,980	Summer chum 83,500–142,192	Fall chum 89,500–167,900	Pink[b] 2,100–9,700
Year	Estimated number of subsistence salmon harvested[a]				
1998[c]	52,910	**16,606**	**81,858**	**59,603**	
1999[c]	50,711	**20,122**	**79,348**	**84,203**	
2000[c]	**33,896**	**11,853**	**72,807**	**15,152**	
2001	53,462	21,977	**68,544**	**32,135**	
2002	**42,117**	**15,619**	**79,066**	**17,908**	
2003	55,221	22,838	**78,664**	**53,829**	
2004	55,102	24,190	**74,532**	**61,895**	
2005	53,409	27,250	93,259	91,534	
2006	48,593	**19,706**	115,093	**83,987**	
2007	55,156	21,878	92,891	98,947	
2008	**45,186**	**16,855**	86,514	**89,357**	
2009	**33,805**	**16,006**	**80,539**	**66,119**	
2010	**44,559**	**13,045**	88,373	**68,645**	
2011	**40,980**	**12,344**	96,020	**80,202**	
2012	**30,415**	21,533	126,992	99,309	
2013	**12,533**	**14,457**	115,114	113,384	**1,076**
2014	**3,286**	**16,898**	86,900	92,229	6,932
2015	**7,582**	**18,252**	83,787	**86,680**	2,645

Source Jallen et al. (2017)

a. Estimates for 1998–2004 do not include personal use harvests, ADF&G test fishery distributions, or salmon removed from commercial harvests. Estimates for 2005–2014 include test fishery distributions because the amounts necessary for subsistence (ANS) are based on harvests from 1990–1999 and included test fishery distribution. **Bold underlined** cells indicate harvest amounts are below the minimum ANS.

b. ANS for pink salmon added by BOF in 2013.

c. Species-specific ANS ranges do not apply before 2001.

Table 4-7.–Estimated subsistence harvest of whitefish, northern pike, and sheefish by community, Yukon Area, 2015.

Community	Households		Estimated nonsalmon harvest				
	Total	Surveyed[a]	Large whitefish[b]	Small whitefish	Northern pike	Sheefish	Total
Hooper Bay	222	93	406	3,581	389	20	4,396
Scammon Bay	119	51	3,823	1,607	1,443	172	7,045
Coastal District subtotal	**341**	**144**	**4,229**	**5,188**	**1,832**	**192**	**11,441**
Nunam Iqua (Sheldon Point)	42	25	841	1,808	47	1,025	3,721
Alakanuk	142	58	1,744	5,822	1,023	1,372	9,961
Emmonak	189	94	1,508	4,730	582	1,470	8,290
Kotlik	124	54	579	2,550	1,883	1,448	6,460
District 1 subtotal	**497**	**231**	**4,672**	**14,910**	**3,535**	**5,315**	**28,432**
Mountain Village	170	60	1,331	1,597	1,818	901	5,647
Pitkas Point	33	23	644	149	356	223	1,372
Saint Marys	135	55	1,636	301	1,007	313	3,257
Pilot Station	121	61	1,258	75	277	172	1,782
Marshall	105	37	3,911	1,559	5,725	746	11,941
District 2 subtotal	**564**	**236**	**8,780**	**3,681**	**9,183**	**2,355**	**23,999**
Russian Mission	76	31	1,117	274	1,305	310	3,006
Holy Cross	64	34	810	23	42	43	918
Shageluk	25	16	222	0	64	54	340
District 3 subtotal	**165**	**81**	**2,149**	**297**	**1,411**	**407**	**4,264**
Anvik	32	23	292	0	81	70	443
Grayling	54	23	259	0	27	238	524
Kaltag	54	19	182	0	30	122	334
Nulato	80	38	480	150	21	438	1,089
Koyukuk	45	11	369	0	55	152	576
Galena	146	49	1,239	171	221	324	1,955
Ruby	64	22	394	100	9	127	630
Huslia	87	35	1,181	225	1,275	356	3,037
Hughes	33	30	3,520	8,430	137	96	12,183
Allakaket	54	16	1,468	219	204	630	2,521
Alatna	7	4	87	35	18	21	161
Bettles	28	10	0	0	10	0	10
District 4 subtotal	**684**	**280**	**9,471**	**9,330**	**2,088**	**2,574**	**23,463**
Tanana	96	42	9,819	4,867	837	1,630	17,153
Stevens Village	8	1	0	0	0	0	0
Birch Creek	13	7	630	0	360	12	1,002
Beaver	25	16	18	0	81	8	107
Fort Yukon	223	71	776	776	604	320	2,476

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Table 4-7.–Page 2 of 2.

Community	Households		Estimated nonsalmon harvest				
	Total	Surveyed[a]	Large whitefish[b]	Small whitefish	Northern pike	Sheefish	Total
Venetie	74	23	90	45	57	12	204
Chalkyitsik	33	19	9	3	121	3	136
District 5 subtotal	**472**	**179**	**11,342**	**5,691**	**2,060**	**1,985**	**21,078**
Total	**2,723**	**1,151**	**40,643**	**39,097**	**20,109**	**12,828**	**112,677**

Source Jallen et al. (2017)

a. The number of households contacted per species may vary. The number of households indicated is the greatest number of households contacted for a given species.

b. Whitefish that are greater than 4 lb in weight are considered large whitefish, and those that are less than 4 lb in weight are considered small whitefish.

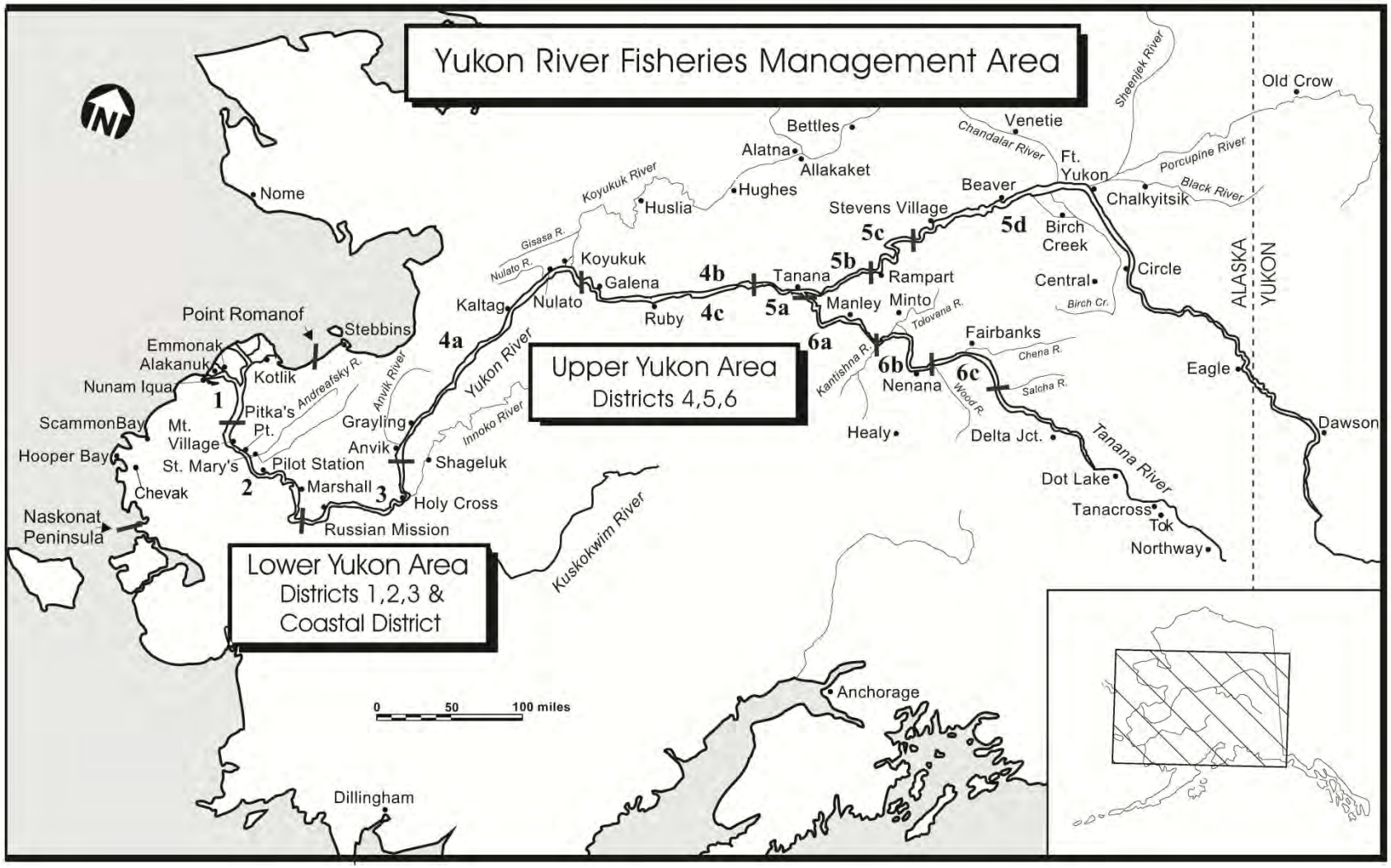

Figure 4-1.–Map of the Alaska portion of the Yukon River drainage, showing communities and districts.

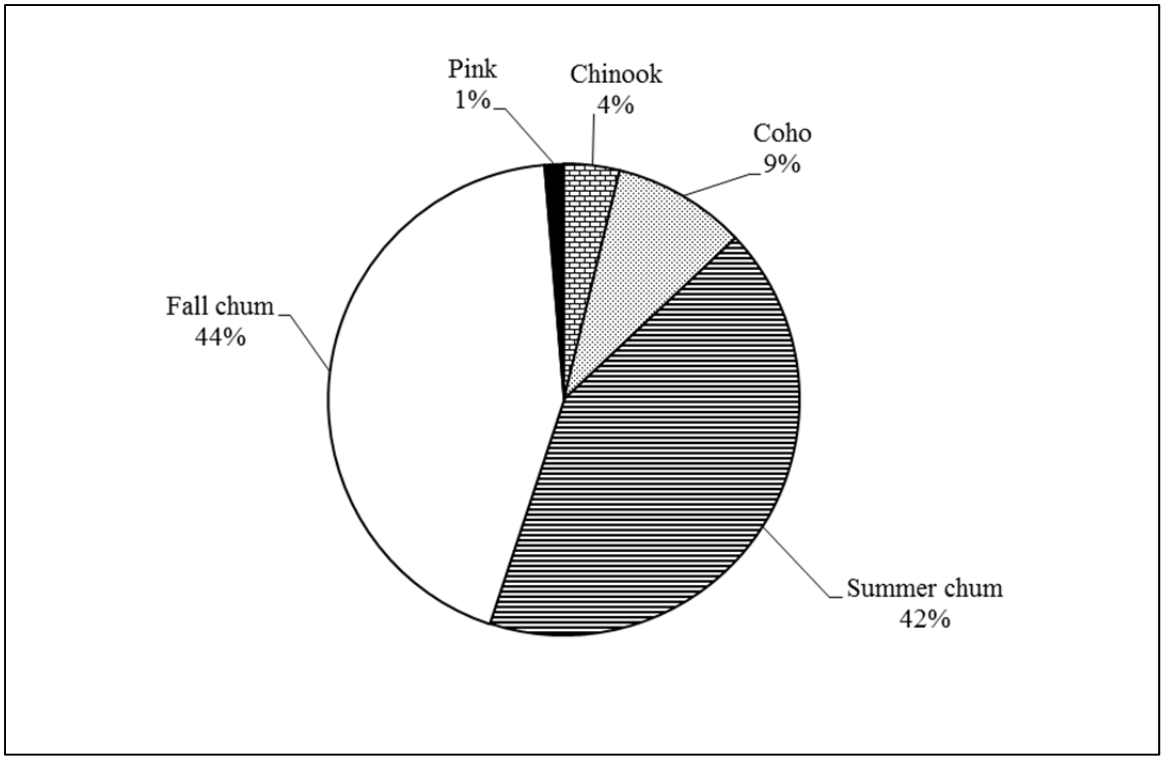

Figure 4-2.–Yukon Area estimated subsistence salmon harvests, 2015.

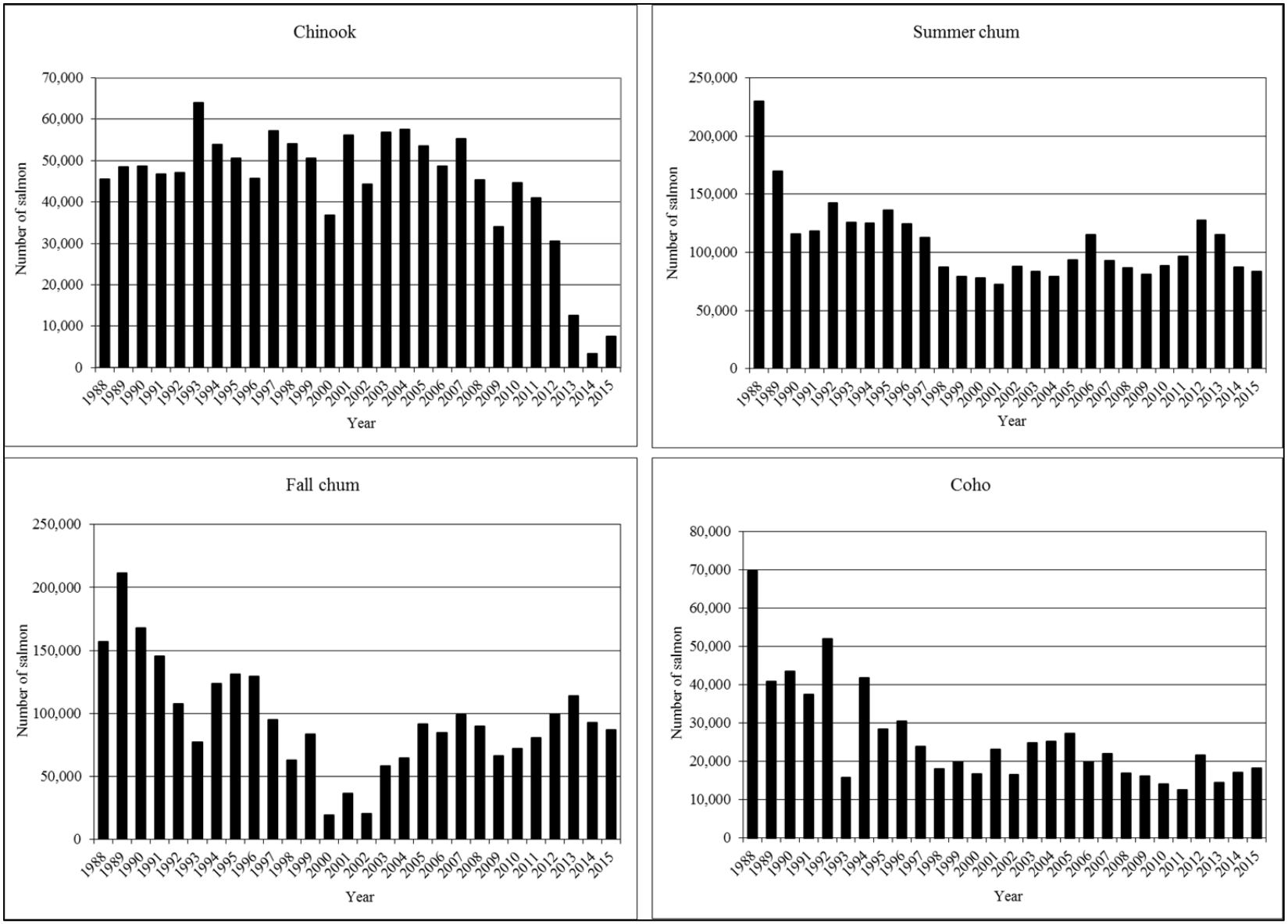

Figure 4-3.–Estimated subsistence salmon harvests by species, Yukon Area, 1988–2015.

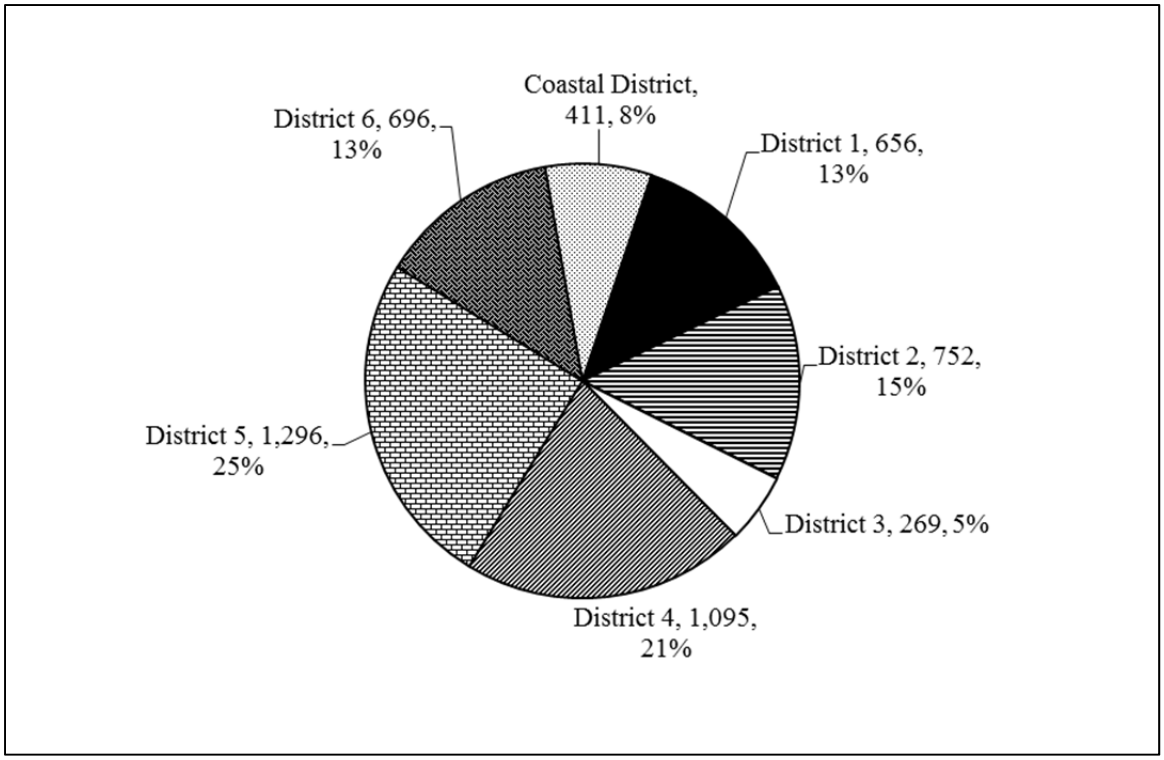

Figure 4-4.–Estimated number of dogs by district, Yukon Area, 2015.

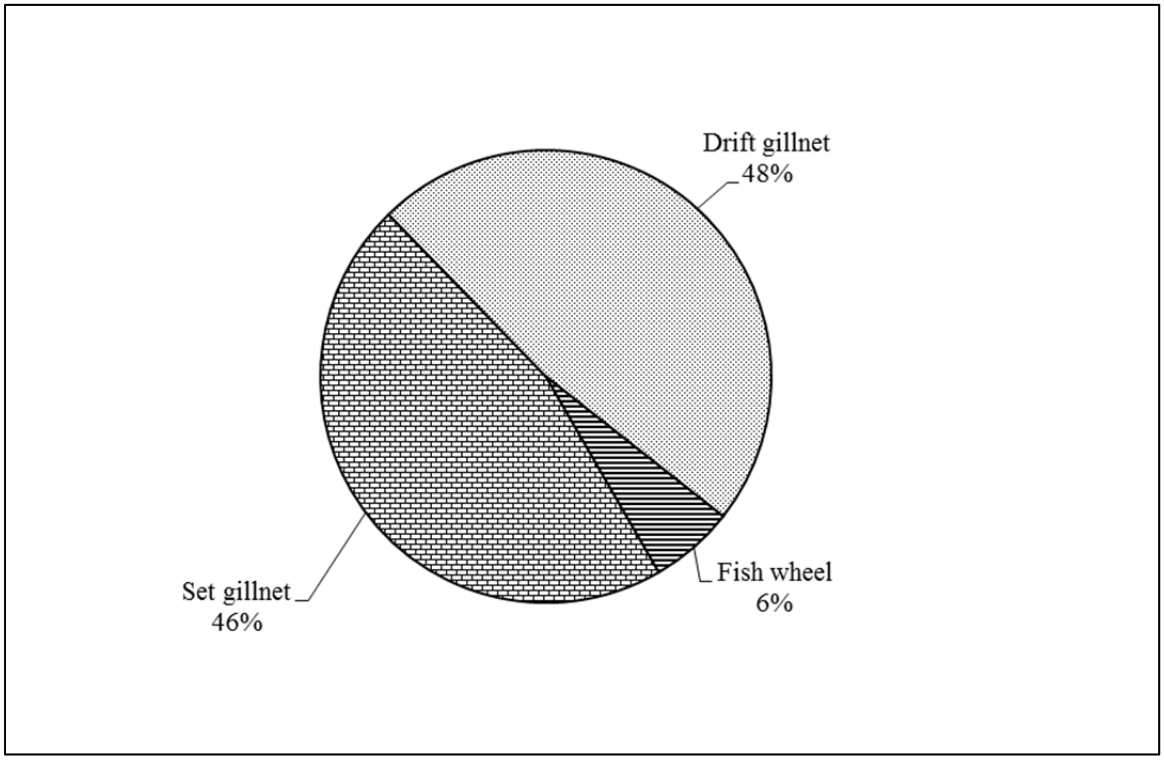

Figure 4-5.–Primary gear type utilized for subsistence salmon fishing, Yukon Area, 2015.

CHAPTER 5: KUSKOKWIM AREA

BACKGROUND

The subsistence salmon fisheries in the Kuskokwim Area are some of the largest in the state of Alaska, in terms of the number of residents who participate and the number of salmon harvested (Fall et al. 2014). Since 1994, when the Alaska Department of Fish and Game (ADF&G) began acquiring reasonably complete statewide coverage of subsistence harvest survey data, over 50% of Chinook salmon harvested under subsistence regulations have been taken in the Kuskokwim Area, mostly in the Kuskokwim River drainage. Between 2010 and 2014 (study years 2009–2013), the Division of Subsistence conducted comprehensive subsistence harvest and use surveys in 23 Kuskokwim Management Area communities. The results indicate that, on average, salmon contribute 42% of the total wild resource harvest (in edible pounds) in the Lower Kuskokwim communities, 65% in the Central Kuskokwim communities, and 25% in the Upper Kuskokwim communities (Brown et al. 2012, 2013; Ikuta et al. 2014; Runfola et al. 2017). Residents of the Kuskokwim Area harvest 5 species of Pacific salmon for subsistence purposes: Chinook salmon *Oncorhynchus tshawytscha*, chum salmon *O. keta*, coho salmon *O. kisutch*, pink salmon *O. gorbuscha*, and sockeye salmon *O. nerka*. Drift gillnetting, set gillnetting, and hook and line fishing are the primary methods used when harvesting salmon, although additional gear types are allowed as specified in 5 AAC 01.270. Kuskokwim Area communities are heavily reliant upon the annual returns of salmon not only for basic nutrition, but also for maintenance of cultural identity and cultural values, in addition to economic opportunities for commercial sales (Andrews and Coffing 1986; Andrews 1989:154; Barker 1993; Brown et al. 2012, 2013; Coffing 1991; Fienup-Riordan 1990:184, 1995:120, 123; Himmelheber 1987:32; Ikuta et al. 2013, 2014, Oswalt 1963a–b, 1990; Pete 1993; Senecal-Albrecht 1998, 1990; Walker and Coffing 1993; Wolfe et al. 1984).

ADF&G has been estimating Kuskokwim Area subsistence salmon harvests annually by postseason subsistence harvest surveys since 1960. Simon et al. (2007a) discussed the history of annual harvest monitoring methods used by the Division of Commercial Fisheries from 1960–1987 as well as the different methods used from 1988–2007 by the Division of Subsistence (see also Walker and Coffing 1993). Beginning in 2008, the Division of Commercial Fisheries once again assumed responsibility for the annual postseason subsistence salmon harvest monitoring program using methods outlined in Carroll and Hamazaki (2012a). In the Kuskokwim Area, there are 38 communities, 27 of which are surveyed each year on a voluntary basis. In 2015, there were approximately 4,349 households in 30 communities, excluding 8 communities that do not consistently participate in the surveys (Table 5-1).[1]

Bethel is the largest community in the region, consisting of approximately 2,076 households in 2015. The south Kuskokwim Bay communities of Quinhagak, Goodnews Bay, and Platinum compose 7% of the total Kuskokwim Area households (Carroll and Hamazaki 2012b) and harvest salmon primarily from the drainages of the Kanektok, Arolik, and Goodnews rivers (Walker and Coffing 1993:1; Wolfe et al. 1984:321–322). The north Kuskokwim Bay communities of Kwigillingok, Kongiganak, and Kipnuk are not located on the Kuskokwim River. Many subsistence salmon fishers from these communities have traveled to the Kuskokwim River to fish, and might have also harvested salmon from coastal areas and local tributaries (Himmelheber 1987:7; Stickney 1984:60–61; Walker and Coffing 1993:1). The north Kuskokwim Bay community of Kongiganak and the Upper Kuskokwim community of Lime Village have

1. Household number estimates are not available for the coastal communities. Subsistence users from these communities harvest salmon in coastal waters as well as in area rivers. Relatively little documentation exists of subsistence salmon harvests of Bering Sea coastal communities because the communities are not included in either the Kuskokwim or the Yukon postseason subsistence salmon harvest monitoring programs (Wolfe et al. 2012). The communities of Kongiganak, Lime Village, and Telida, and the households there are included in the tables and "Total Households" of this report because the data are drawn from an ADF&G Division of Commercial Fisheries database that retains these communities as regular participants, although they did not participate in surveys for 2015 and Telida is no longer considered a year-round community (Shelden et al. 2016).

usually participated in the voluntary ADF&G harvest survey, but neither has been successfully visited often or consistently enough in recent years to provide a useful estimate via this method and were therefore not estimated in 2015; Kwigillingok and Kipnuk had often participated but have not since 2004, the most recent year in which all 3 participated (Simon et al. 2007a:36). Several Bering Sea coastal communities have chosen not to participate in the ADF&G study for most years. These include the communities of Mekoryuk (on Nunivak Island), Newtok, Tununak, Toksook Bay, Nightmute, and Chefornak (Carroll and Hamazaki 2012a–b). While little information is available, residents of Bering Sea coastal communities harvest salmon from local rivers and coastal waters, which likely include coastal stocks as well as mixed stocks that were not bound for the Kuskokwim River (Fienup-Riordan 1983:112; Walker and Coffing 1993:1). In 2011, sponsored by the Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative, the Association of Village Council Presidents (AVCP) collected subsistence salmon harvest data in 7 coastal communities: Chefornak, Kipnuk, Mekoryuk, Newtok, Nightmute, Toksook Bay, and Tununak (Kwigillingok chose not to participate in the AVCP project) (Wolfe et al. 2012). That project provided the only reliable subsistence salmon harvest data in recent years for this portion of the Kuskokwim Area (Table 5-2), and in 2013, the data were considered by the Alaska Board of Fisheries as they revised the amount reasonably necessary (ANS) for subsistence uses of salmon in the remainder of the Kuskokwim Area.

REGULATIONS

Statewide eligibility criteria require individuals to be Alaska residents for the preceding 12 months before harvesting salmon for subsistence uses. Most subsistence salmon fishers in the region are Kuskokwim Area residents; however, some subsistence fishers are domiciled in other parts of Alaska and return to fish alone, or to assist family or friends with the harvesting or processing of salmon (Simon et al., 2007a:5).

Prior to 1990, there were additional restrictions on participation in the subsistence fishery related to the state's rural priority for subsistence, which subsequently was determined by the Alaska Supreme Court to be unconstitutional. In 1988, the State of Alaska Board of Fisheries formed the Kuskokwim River Salmon Management Working Group (Working Group) in response to requests from stakeholders in the Kuskokwim Area who sought a more active role in the management of salmon fishery resources (Bailey and Shelden 2014:1; Smith and Linderman Jr. 2008:1). The Working Group is composed of knowledgeable stakeholders, processors, and sport fishery representatives, as well as ADF&G biologists and social scientists. It acts in a representative fashion for communities throughout the Kuskokwim River drainage.

As a result of the passage of Alaska National Interest Lands Conservation Act (ANILCA) and in light of a 1989 Alaska Supreme Court decision, the federal government established the federal subsistence program, which provides subsistence opportunity for qualified rural residents on applicable federal public lands and in applicable federal public waters. Federal subsistence schedules, openings, closings, and fishing methods in the Kuskokwim Area are generally the same as those for state subsistence salmon fisheries, unless superseded by federal special action (50 CFR § 100.27). Regulatory authority for Kuskokwim River salmon management is shared by the Federal Subsistence Board (FSB) and the BOF. On the Kuskokwim, ADF&G is responsible for implementing the Kuskokwim River Salmon Management Plan (5 AAC 07.365) and also has inseason discretionary management authority of salmon in Alaska navigable waters. The portion of the Kuskokwim River drainage from the Aniak River downstream to Kuskokwim Bay is within the boundaries of the Yukon Delta National Wildlife Refuge (YDNWR). As such, the U.S. Fish and Wildlife Service (USFWS) shares inseason subsistence fishing management decision-making with ADF&G in this section of the Kuskokwim River. The USFWS holds final decision-making authority over management of salmon in these waters in the event that the federal subsistence program determines that subsistence uses by non-federally qualified users must be eliminated in order to meet the federal subsistence priority. The Working Group advises state and federal managers through an established process and is currently the primary forum through which management decisions

are made regarding Kuskokwim River subsistence, commercial, and sport salmon fisheries (Smith and Linderman Jr. 2008:1). The highest priority in state and federal management of the Kuskokwim River's salmon populations is biological sustainability of the resources based on principles of sustained yield. In the event that returning salmon numbers are not sufficient to meet established escapement goals that will allow for the maintenance of future generations of salmon populations, consumptive uses of salmon may be restricted. Under conditions when there is a harvestable surplus beyond these minimum escapement levels, consumptive uses of salmon are prioritized for different user groups. Individuals must be Kuskokwim Area residents to participate in the Kuskokwim federal subsistence salmon fishery (50 CFR § 100.5).

Alaska Statute 16.05.258, "Subsistence use and allocation of fish and game," establishes the subsistence use priority (above sport, commercial, and personal use) when resources are not abundant enough to provide for all consumptive uses and while remaining in accordance with principles of sustained yield. Subsistence uses protected by the subsistence priority are those practices identified as customary and traditional practices as determined by the BOF. In 1993, the BOF made positive findings for customary and traditional uses of all salmon species in the entire Kuskokwim Area.[2] As part of these findings, the BOF then determined the amount reasonably necessary for subsistence (ANS) in these respective areas as one means to provide reasonable opportunities for subsistence uses. Based on historical harvest information, an ANS of 192,000–242,000 for salmon of all species in the Kuskokwim Area was determined (5 AAC 01.286). In 2001, the BOF amended these ANS ranges for Kuskokwim River using subsistence harvest data from the years 1990 to 1999. After reviewing various options, the BOF made new customary and traditional use and ANS findings for the Kuskokwim area by species.

In January 2013, the BOF again modified ANS ranges by species for the Kuskokwim River drainage and other portions of the Kuskokwim Area. The current ANS ranges for salmon in the Kuskokwim Management Area are as follows (5 AAC 01.286(b)):

67,200–109,800	king [Chinook] salmon in the Kuskokwim River drainage;
41,200–116,400	chum salmon in the Kuskokwim River drainage;
32,200–58,700	sockeye salmon in the Kuskokwim River drainage;
27,400–57,600	coho salmon in the Kuskokwim River drainage;
500–2,000	pink salmon in the Kuskokwim River drainage;
6,900–17,000	salmon in Districts 4 and 5 combined; and
12,500–14,400	salmon in the remainder of the Kuskokwim Area

The BOF in 2013 also updated and clarified the Kuskokwim River Salmon Management Plan (5 AAC 07.365). The new plan provides guidelines for managing the Kuskokwim River salmon fisheries to meet escapement goals and the subsistence priority. During times when the amount of fish available for subsistence harvest is limited, the commissioner may open a fishing period during which king salmon may only be taken by persons 60 years of age or older. Persons 60 years of age or older can only be assisted by family members within the second degree of kindred. The persons 60 years of age or older must be present while fishing, and proxies are not allowed.

Subsistence harvest of Pacific salmon species in the Kuskokwim River is allowed without a permit (5 AAC 01.280) and with generally no closed seasons (5 AAC 01.260), except as specified in the management plan or otherwise ordered for conservation purposes. Alaska regulations allow a variety of gear types to be used in the Kuskokwim River for subsistence salmon fishing and include specifications regarding the use of gillnets (5 AAC 01.270). There are no federal or state bag or possession limits for

2. The Kuskokwim Area includes the Kuskokwim River drainage, all waters of Alaska that flow into the Bering Sea between Cape Newenham and the Naskonat Peninsula, and Nunivak and St. Matthew islands. 38 communities are located within this area.

subsistence salmon harvests in the Kuskokwim River, except from June 1 through August 31, when subsistence fishing with a hook and line attached to a rod or pole, in that portion of the Aniak River drainage upstream of Doestock Creek, the bag and possession limit is 2 Chinook salmon, and rainbow trout, *O. mykiss,* may not be retained (5 AAC 01.295). Federal regulations of all subsistence fish harvests in Alaska federal public lands and waterways are administered under 50 CFR §100.27, including seasons, gear types, and bag and possession limits on all salmon and nonsalmon species.

By regulation, therefore, the subsistence salmon fishing season in the Kuskokwim Area is generally open unless a subsistence fishing schedule closure is implemented. If closures to the fishery are necessary, they are implemented by emergency order prior to, during, and after commercial fishing periods, or closures to the fishery are implemented by emergency order for conservation purposes (see 5 AAC 01.260, and 5 AAC 07.365). On the Kuskokwim River, a subsistence fishing schedule with periodic fishing closures (openings between these closures were often referred to as "windows" or "openers") was implemented from 2001–2006 and has since been discontinued.

Subsistence Fishery

Similarly to 2014, the department's preliminary management strategy for the 2015 salmon fishing season in the Kuskokwim Area was to institute restrictive management actions at the onset of the fishery with the potential to relax restrictions based on inseason information if warranted. Regulations intended to reduce overall Chinook salmon harvests while allowing for some subsistence salmon fishing opportunity during times of Chinook salmon conservation were adopted by the BOF in 2014 and were put into effect again for the 2015 fishing season. These regulations allow the use of dip nets as legal subsistence salmon fishing gear and restrict subsistence gillnets to 4-inch mesh size and 25 fathoms in length.

The BOF met in March 2015 during which 3 proposals for Kuskokwim Area subsistence salmon fishing were adopted. The first adopted proposal addressed the use of 4.0 inch mesh gillnets during times of Chinook salmon conservation. ADF&G may now specify that 4.0 inch mesh gillnets be operated as set gillnets only; no part of which may be operated more than 100 feet from the ordinary high water mark. The intent is to keep these gillnets close to the bank and out of the channel. The BOF adopted a second proposal that gives ADF&G authority to specify the length of gillnets used during subsistence salmon fishing periods. The intent of this proposal was to give ADF&G a mechanism to provide very limited directed Chinook salmon subsistence harvest opportunity when a small surplus is available while still ensuring Chinook salmon conservation. Lastly, the BOF adopted a proposal allowing fish wheels to be operated with chutes during times of Chinook salmon conservation. Prior regulations only allowed the use of live boxes on fish wheels requiring live release of all Chinook salmon taken, and this option is still available (Poetter et al. 2016:7).

In 2015, the Federal Subsistence Board (FSB) initiated a Federal Special Action to allow only federally qualified subsistence users to fish for salmon within the boundaries of the YDNWR; residents of the Kuskokwim River drainage and the villages of Chefornak, Kipnuk, Kwigillingok, and Kongiganak were identified as federally qualified to fish in the refuge.[3,4] Under another Federal Special Action, subsistence fishing was restricted to 3 days per week with the use of set gillnets with 4.0 inch or less mesh size not to exceed 60 feet (10 fathoms) in length within the Yukon Delta National Wildlife Refuge boundaries beginning May 21 downstream of Tuluksak, and on May 28 between Tuluksak and Aniak. This restriction was also implemented by ADF&G from Aniak to the Holitna River mouth beginning June 4. Also beginning on June 4, the use of fish wheels and dip nets was allowed until further notice. Fish wheels were required to be equipped with either a chute and closely attend while in operation or a live

3. Brian J. McCaffery, Acting Yukon Delta Refuge Manager, 2015, "Saving our King Salmon: What to Expect This Fishing Season," Accessed January 24, 2015. https://www.doi.gov/sites/doi.gov/files/migrated/subsistence/news/fishing/upload/Saving-Our-King-Salmon-BJM-06-May-2014.pdf
4. Federal Subsistence Board, 2015, "2015 Kuskokwim Area Chinoook Salmon Fishing Outlook and Federal Management Fact Sheet 1," Accessed January 24, 2015. https://www.fws.gov/uploadedFiles/Fact%20Sheet%20-US%20Fish%20and%20Wildlife%20Service%20-Kuskowim%20Chinook%20Salmon%20Fishing%20%20Information%20%20May%206%202015.pdf

box with no less than 45 cubic feet of water, to be checked at least every 6 hours, and all Chinook salmon were required to be returned to the water alive. All Chinook salmon caught in a dip net were also required to be returned to the water alive. On June 11, these same restrictions were enacted from the Holitna River mouth to the headwaters of the Kuskokwim River. An area at the mouth of the Kuskokwim River (east of the Ishkowik River to the northern boundary of District W-4) was also closed to subsistence fishing on May 28, in order to provide additional protection to Chinook salmon entering the Kuskokwim River (Poetter et al. 2016:8–9).

Beginning June 10, 2015, USFWS allowed subsistence salmon fishing with gillnets with mesh up to 6 inches federally qualified subsistence users in possession of a Community Harvest Permit. Prior to implementation, "the drainagewide harvest quota [for the Community Harvest Permit program] was determined to be 7,000 Chinook salmon. Specific community allocations were based on each community's share of the average total subsistence harvest of Kuskokwim River Chinook salmon over 20 years (1990–2009)" (Shelden et al. 2016). The USFWS issued these permits to tribal entities in each community; the tribes allocated the permits locally and reported back to USFWS. Fishing for Chinook salmon with hook and line gear was closed drainagewide beginning June 11 (Poetter et al. 2016:8–9).

Other than the Social and Cultural Harvest Permits, the first opportunity for directed subsistence salmon fishing occurred on June 20, 2015 when ADF&G allowed Alaska residents 60 years of age or older to fish for salmon with 6-inch mesh drift gillnets no longer than 10 fathoms upstream of Aniak. The first 6-inch mesh gillnet opportunity below the Johnson River was on June 22 for 4 hours to harvest sockeye and chum salmon. On July 2, the department resumed management of Kuskokwim River salmon fishing within the boundaries of the YDNWR and implemented restrictions consistent with those in place upstream.[5] Limited subsistence fishing opportunities for chum and sockeye salmon were allowed as those runs progressed through the season. However, the chum salmon run was assessed to be poor and restrictions continued until August 4 when the department rescinded all restrictions to subsistence salmon fishing in the entire Kuskokwim Area (Poetter et al. 2016:8–9).

During the 2015 season, ADF&G stock assessment projects detected that both Chinook and chum salmon returns appeared to be of below-average abundance at assessment. In order to reduce harvest of these stocks, the initiation of commercial salmon fishing was delayed until the Chinook and chum salmon runs had passed through District 1. Beginning on August 10, the department allowed limited commercial fishing opportunities for directed coho salmon harvests in the lower Kuskokwim River (Poetter et al. 2016:8–9).

Based upon analysis of the department's Chinook Salmon Run Reconstruction Model, the total run of Kuskokwim River Chinook salmon in 2015 was estimated to be 172,055 fish (95% CI: 129,115–229,276 fish). Total run abundance was below average but within a range of run sizes that could likely have supported subsistence harvest at levels near the lower bound of amounts reasonably necessary for subsistence (67,200–109,800) as defined by the Alaska Board of Fisheries (5 AAC 01.286). The total escapement of Kuskokwim River Chinook salmon in 2015 was estimated to be 155,464 (95% CI. 112,524–212,685). Total escapement was near average due to harvest restrictions throughout much of Chinook salmon run, and the drainagewide sustainable escapement goal of 65,000–120,000 was likely exceeded (Liller and Hamazaki 2016:7). The 2015 estimated total Chinook salmon subsistence harvest of 19,437 fish (Table 5-1) was second smallest estimated harvest on record, and less than 25% of the long term average annual Chinook salmon subsistence harvest of 84,000 fish.[6]

5. Chinook salmon were to be released alive from fish wheels and dipnets. Set gillnet mesh size was restricted to 4 inches or less, and set gillnets in the mainstem Kuskokwim River were required to be deployed on the riverbank within 100 feet of the normal high water mark

6. Aaron Poetter, ADF&G News Release, 2015 Preliminary Kuskokwim Area Salmon Season Summary. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/628087106.pdf

SUBSISTENCE SALMON HARVEST ASSESSMENT METHODS

ADF&G has been estimating Kuskokwim Area subsistence salmon harvests annually by postseason subsistence harvest survey since 1960: by the Division of Commercial Fisheries in 1960–1987, by the Division of Subsistence in 1988–2007 (Simon et al. 2007a), and by the Division of Commercial Fisheries since 2008 (Carroll and Hamazaki 2012a–b). The purpose of the survey is to collect data about the number and species of salmon harvested by area residents.

For data collection in 2015, under a cooperative program between ADF&G and the USFWS Office of Subsistence Management, subsistence salmon harvest data collection in Bethel was conducted by staff from the Orutsararmiut Native Council (ONC), which has been involved in subsistence salmon harvest monitoring in Bethel since 1999. Subsistence harvest data collection in Aniak was conducted under a similar agreement by staff from the Kuskokwim Native Association (KNA), which has been involved in subsistence salmon harvest monitoring in Aniak since 2002 (Simon et al. 2007a).

The data from the postseason subsistence harvest survey are analyzed to provide an estimate of the number of salmon harvested for subsistence purposes. This information has been used by ADF&G, the U.S. Fish and Wildlife Service (USFWS), the BOF, and the FSB to manage customary and traditional (C&T) uses of salmon and to provide reasonable opportunities for continued customary and traditional uses of salmon throughout the area. More detailed descriptions of subsistence salmon harvest monitoring methods utilized in the Kuskokwim Area are found elsewhere (Hamazaki 2011; Simon et al. 2007a; Shelden et al. 2014; Walker and Coffing 1993).

Household Harvest Surveys

Study Design

The postseason subsistence harvest survey for the majority of communities was designed based on a stratified random sample survey methodology (Scheaffer 1990). From 1989 to 2010, each household was classified into three strata based on the household's recent 2-year history of participation in the subsistence fishery. Beginning in 2005, surveys collected harvest data for pink salmon. In 2011, the above household classification was expanded into 5 strata based on a household's most recent 2 known years of participation within the past 5 years in the subsistence fishery.

An attempt was made to census the 2 highest harvest strata groups, and the stratum group for which no past harvest level could be determined. The remaining 2 strata groups of light and non-harvesters were sampled at 30% each. A full description of methods used for harvest level classification and sampling are available in Shelden et al. (2014:4–12).

The data were entered into the subsistence harvest database maintained by the Division of Commercial Fisheries. The data were subsequently extracted and processed by Commercial Fisheries staff. The analyzed data were transmitted to Division of Subsistence analysts for final formatting and inclusion in the Alaska Subsistence Fishery Database, maintained by the Division of Subsistence. All subsistence harvest data were treated as confidential, such that individual harvest data are not shared, and all analysis is aggregated and anonymous. The study was generally conducted in accordance with the *Alaska Federation of Natives Guidelines for Research*.[7]

Estimating Bethel Salmon Harvests

In Bethel, the Division of Commercial Fisheries was responsible for designing and producing the survey instrument and selection of survey households, and ONC was responsible for conducting household surveys. Due to the impracticality of maintaining an accurate household list in order to stratify Bethel, a 25% random survey was conducted based on a simple random survey methodology where each dwelling

7. Alaska Federation of Natives. 2013. "Alaska Federation of Natives Guidelines for Research." Alaska Native Knowledge Network. Accessed May 14, 2014. http://www.ankn.uaf.edu/IKS/afnguide.html.

(physical location instead of household) was the primary sampling unit. Before the harvest survey, ADF&G oriented ONC technicians to the project and instructed them in the proper implementation of the survey. ONC technicians conducted surveys in Bethel from October through November. Survey data were entered and analyzed by Division of Commercial Fisheries staff to generate subsistence salmon harvest estimates by species. Fish harvested under the Community Harvest Program were reported to OSM by tribal entities.

Estimating Aniak Salmon Harvests

In Aniak ADF&G Division of Commercial Fisheries was responsible for designing and producing the survey instrument and selection of survey households, and KNA was responsible for conducting household surveys in Aniak. Before the harvest survey, ADF&G oriented KNA technicians to the project and instructed them in the proper implementation of the survey. Surveys were conducted and data were entered and analyzed by ADF&G Commercial Fisheries staff to generate subsistence salmon harvest estimates by species. Fish harvested under the Community Harvest Program were reported to OSM by tribal entities.

Estimating Kuskokwim Area Community Subsistence Salmon Harvests

For the remaining communities in the Kuskokwim Area, the goal was to collect subsistence harvest data through household harvest surveys conducted by Division of Commercial Fisheries staff beginning in the first week of October and continuing through November. The survey crew consulted with community officials before arriving in the community to update community household lists. Other resources were also useful in updating household lists, including telephone and utility records. Communities were prioritized based on transportation scheduling, staff time and community willingness to participate in the program. Participation in the surveys was voluntary, and some community leaders requested that the surveys not take place in their communities. The estimates also include a tally of Chinook, chum, and sockeye salmon provided to the Federal Office of Subsistence Management by tribes as required for USFWS permits issued under the Community Harvest Permit program in 2015 (Shelden et al. 2016:23).

Harvest Calendars

In addition to systematic household harvest surveys, subsistence salmon harvest calendars were mailed in late April or early May so that they were available to fishers prior to the start of the salmon fishing season. The calendar data continue to be instrumental for examination of subsistence salmon harvest timing. The calendars are also used by some area fishers throughout the fishing season so that they can be referenced during postseason household harvest surveys.

Calendar mailings were based on the most up-to-date household lists used in the harvest monitoring program. Extra calendars were printed and maintained at the Bethel ADF&G office for distribution as needed or upon request. In an effort to increase the use and return rate of subsistence salmon harvest calendars, public service announcements were broadcast on local radio stations during the fishing season reminding fishers to keep logging their catches on their calendars and describing the importance of calendars for documenting subsistence salmon uses.

Most subsistence salmon harvest data obtained from the returned calendars were not used to directly calculate Kuskokwim Area subsistence salmon harvest estimates, but these data were used to corroborate household survey data. Calendars were occasionally used as the primary source of harvest data when contact was not made with a particular household. Calendars often include harvests from multiple households that fished together, so reported harvests may represent the efforts of multiple households. In such cases, every effort was made to contact the head of household to verify harvest information when using the calendar data. Especially in cases where households were not contacted as part of the household surveys, calendars also provided data for determining the manner in which households participated in the subsistence salmon fishery. These households were then assigned to one of the 5 sampling strata accordingly (Shelden et al. 2014:8). Calendar data are not provided in this report.

Data Correction and Archiving

Division of Commercial Fisheries staff reviewed and edited all completed surveys and periodically sent reviewed surveys to staff in Bethel and Anchorage for further processing. The survey data were entered into an Arctic-Yukon-Kuskokwim Database Management System (AKDBMS) data server. The database was structured to ensure data were entered completely and accurately, and there were periodic back-ups to prevent data loss.

Data Analysis

Community estimates of subsistence salmon harvest for surveys collected in communities outside of Bethel and Aniak were generated using a stratified random sampling expansion technique. This approach applies means to unsurveyed households within each strata group and sums total estimates of the 5 strata groups to give a community harvest estimate. Communities where harvest survey data were inadequate or unavailable, for 2013 and earlier, were estimated by employing a Bayesian hierarchical multiple imputation method, except in communities that had not participated frequently enough in recent years for an estimate to be calculated (Shelden et al. 2016). The details of these approaches are described in Shelden et al. (2014).

2015 SAMPLING SUMMARY

In 2015, the estimated total number of households in communities normally surveyed in the Kuskokwim Area was 4,349. This number includes households in 3 of the 11 communities retained in the database as usual participants, although none participated in 2015 and had not participated frequently enough in recent years for an estimate to be calculated (Kongiganak, Lime Village, and Telida)[8], but does not include Kipnuk and Kwigillingok households in north Kuskokwim Bay (together 235 as of 2010) or the Bering Sea coast communities of Mekoryuk, Newtok, Nightmute, Toksook Bay, Tununak, and Chefornak (500 total households as of 2010; Table 5-1). Of the 4,349 estimated households, 76% were located in the Lower Kuskokwim region, including 2,076 households (48% of the total estimated households) in Bethel and 1,210 households (28%) in the remainder of Lower Kuskokwim communities, followed by 355 households in Middle Kuskokwim, and 284 households in Upper Kuskokwim (Table 5-1).

Out of the 4,349 households in communities normally surveyed, surveys were conducted with 1,615 households within 27 Kuskokwim Area communities (Table 5-1). As noted above, a new method was developed in 2008 to estimate subsistence salmon harvests in communities in which no household surveys took place if adequate harvest data for previous years existed; however, there were Kuskokwim Area communities for which there were insufficient historical data to develop annual harvest estimates using a Bayesian hierarchical multiple imputation method. As a result, the Kuskokwim Management Area total should be viewed as a minimum estimate because data for some communities are not available (Simon et al. 2007a:20).

For lower Kuskokwim River communities, 1,109 (34%) of the 3,286 households were contacted. In the south Kuskokwim Bay region (Quinhagak, Goodnews Bay, and Platinum), 147 (42%) of the 354 households were contacted. None of the Bering Sea coastal communities were surveyed in 2015, and data for previous years are incomplete. Currently, subsistence salmon harvest information collected by AVCP for 2011 is the only available and reliable data source for the region (Wolfe et al. 2012).

The 13 communities of the middle and upper Kuskokwim River regions are generally smaller than lower river communities, and together compose 15% (619 households) of total households in the Kuskokwim Area. In the middle Kuskokwim River region, defined here as communities located on the Kuskokwim River from Lower Kalskag upriver to Chuathbaluk, 195 (57%) of 345 households were contacted in 2015. For upper Kuskokwim communities, defined here as communities located on the Kuskokwim River from

8. The village of Kongiganak in the north Kuskokwim Bay declined a request by ADF&G staff to conduct surveys in 2012–2015. Lime Village was not attempted for logistical reasons, and the village of Telida appears to be a seasonally occupied location with no year-round residents.

Crooked Creek upriver to Telida (in addition to Lime Village located on the Stony River and Takotna located on the Takotna River), 164 (60%) of 274 households were contacted. Lime Village and Telida were not surveyed in 2015. The communities of Georgetown and Napaimute are not currently included in the community sampling list due to limited permanent populations and primarily seasonal use patterns for these 2 communities; the large majority of Georgetown and Napaimute community members are surveyed during their residence in other Kuskokwim River communities.

2015 SUBSISTENCE SALMON HARVEST SUMMARY

A summary of the subsistence salmon harvest estimates by community and fishing area is presented in Table 5-1. In 2015, fishers harvested an estimated total of 140,431 salmon for subsistence use from the Kuskokwim Area. People in the Lower Kuskokwim communities harvested about 106,234 salmon, 76% of the estimated total subsistence salmon harvest, including 41,550 salmon (30%) in Bethel and 64,684 salmon (46%) in the remaining Lower Kuskokwim communities (Table 5-1). Fishers in the Middle Kuskokwim communities harvested 18,205 fish (13%), followed by 9,168 fish (7%) in South Kuskokwim Bay, and 6,823 fish (5%) in the Upper Kuskokwim.

Chum salmon contributed 31% (43,516 fish) of the estimated subsistence salmon harvest, followed by sockeye salmon (28%, 39,429 fish), coho salmon (26%, 36,816 fish), Chinook salmon (14%, 19,437), and pink salmon (1%, 1,233 fish) (Table 5-1 and Figure 5-1). In 2015, the subsistence harvests of all salmon species except coho were lower than the most recent 5 year average, and all were below the most recent 10 year average. The 2015 subsistence harvests of Chinook salmon (19,437 fish) were 57% below the 5-year (2010–2014) average harvest of 45,584 fish and 72% below the 10-year (2005–2014) average harvest of 69,208 fish. Declines in the harvests of chum and sockeye were less substantial than for Chinook salmon: 43,516 chum salmon (30% lower than the 5-year average, 33% lower than the 10-year average); 39,429 sockeye salmon (16% lower than the 5-year average, 17% lower than the 10-year average). The harvest of 36,816 coho salmon was slightly lower than the 5-year average (2% lower), and slightly greater than the 10-year average (1.5%) (Table 5-3). Key respondents contacted by Division of Subsistence staff during the 2015 salmon fishing season discussed attempting to increase their harvests of chum, sockeye, and coho salmon in order to obtain enough salmon to meet their households' needs during a summer of restrictions that significantly limited their Chinook salmon harvests.[9] Chinook salmon abundance in the Kuskokwim River drainage has decreased since 2007, with some of the lowest total runs occurring in 2011–2014 (Bue et al. 2012).[10] Lower Kuskokwim River Area communities accounted for 73% of the total estimated Chinook salmon subsistence harvest in the Kuskokwim Area, 83% of the total chum salmon harvest, 81% of the total sockeye salmon harvest, and 63% of the total coho salmon harvest. Residents of Bethel accounted for 25% of subsistence-caught Chinook salmon, 33% of the estimated total coho salmon harvest, 31% of the total sockeye salmon harvest, and 27% of the total estimated chum salmon harvest (Table 5-1).

As noted, several coastal communities within the Kuskokwim Area have chosen not to participate in the postseason subsistence harvest surveys conducted by ADF&G; however, 7 of these communities participated in a study conducted by AVCP to estimated subsistence salmon harvests for 2011 (Wolfe et al. 2012; Table 5-2). The total estimated subsistence harvest of salmon for these 7 communities in 2011 was 16,593 fish, including 7,226 chum (44%), 4,439 sockeye (27%), 2,864 coho (17%), 1,298 Chinook (8%), 746 pink (4%), and 20 salmon of unknown species (<1%).

Use of Salmon for Dog Food

Historically, salmon harvested for use as dog food were a large portion of the overall subsistence salmon harvest; specifically, chum and coho salmon. In recent years, the number of households harvesting salmon specifically for dog food has declined due to decreased use of dog teams for transportation. In

9. David Runfola, Kuskokwim Area lead subsistence resource specialist, ADF&G, Fairbanks, personal communication, May 29, 2017.
10. Aaron Poetter, Kuskokwim Area Management Biologist, ADF&G, Anchorage, personal communication, May 20, 2016.

2015, data show that 28 households reported harvests of 5,249 salmon for use as dog food (Table 5-4), less than half the number used for that purpose in 2014 (10,941 fish). The majority of the salmon reported as fed to dogs were sockeye salmon, at 2,869 fish (55%), while chum salmon accounted for 1,899 fish (36%). Coho salmon contributed 283 fish (5%) and pink salmon 169 fish (3.2%) to the harvest that was used for dog food. Households do not target Chinook salmon for dog food; however, 29 Chinook salmon (<1%), likely unfit for human consumption, were reported to have been fed to dogs in an effort to avoid wasting the fish. It is common for most households to feed scraps—backbones, entrails, and salmon unfit for human consumption—to their dogs.

Gear Types

Kuskokwim Area subsistence fishers deploy a variety of gear types to harvest salmon (e.g., set gillnet, drift gillnet, fish wheel, or rod and reel) (Table 5-5). Households that harvested salmon were asked to provide information on the primary gear type used by their household for harvesting salmon. In 2015, out of 866 contacted fishing households that responded to gear type questions, 595 (69%) reported drift gillnets as their primary subsistence salmon fishing gear type, 152 (18%) reported set gillnets, 115 (13%) reported subsistence rod and reel gear, and 4 (<1%) reported a fish wheel as their primary gear type used for subsistence salmon fishing. Preferred gear types vary between regions of the Kuskokwim Area, and fishers often select which gear type to use based on local environmental factors such as river morphology as well as salmon species to be targeted. In recent decades, drift gillnets have been the most common gear type deployed by fishers in the lower and middle Kuskokwim River communities where river depth and width permit the efficient use of this type of net. In communities of the upper Kuskokwim River, a narrower and generally shallower river channel typically restricts fishers to the use of set gillnets and occasionally fish wheels. Also, subsistence fishers who reside near clear water streams often harvest salmon by rod and reel (e.g., Kwethluk, Takotna, and Nikolai). Local community or family customs and traditions associated with subsistence salmon fishing, are also important when fishers determine the best subsistence salmon fishing gear to use, such as rod and reel gear for Chinook salmon in the Pitka Fork Salmon River by Nikolai fishers and for coho salmon along the Kuskokwim riverfront in Aniak in July and August.

Salmon Retained from Commercial Fishing for Subsistence Uses

Households involved in commercial salmon fishing occasionally keep a portion of their commercial harvest for subsistence uses; however, the number of salmon retained from commercial fishing activities for subsistence is usually low. In 2015, a total of 606 salmon were retained from commercial catches, including 181 Chinook, 228 coho, 111 sockeye, 25 pink salmon, and 61 chum salmon (Table 5-6).

OTHER FISH

Harvest data for nonsalmon fish species are also collected as part of the postseason salmon survey. In 2015, reported harvests of nonsalmon species in the Kuskokwim Area included 30,079 humpback whitefish; 22,382 broad whitefish; 18,073 cisco (including Bering and least ciscoes); 4,283 sheefish; 17,716 burbot; 65,306 northern pike; 209,207 Alaska blackfish; 171,704 smelt (predominantly rainbow smelt); 7,924 Pacific herring; 2,459 Arctic grayling; 8,182 char/Dolly Varden; and 992 rainbow trout (Table 5-7).

The Division of Subsistence has recently conducted comprehensive subsistence harvest and use surveys in the following 20 Kuskokwim River drainage communities: in 2010 (study year 2009), Aniak, Chuathbaluk, Crooked Creek, Lower Kalskag, Red Devil, Sleetmute, Stony River, and Upper Kalskag (Brown et al. 2012); in 2011 (study year 2010), Akiak, Kwethluk, Oscarville, Tuluksak, Georgetown, and Napaimute (Brown et al. 2013); in 2012 (study year 2011), Napakiak, Napaskiak, McGrath, Nikolai, and Takotna (Ikuta et al. 2014); in 2013 (study year 2012), Bethel (Runfola et al. 2017); and in 2014 (study year 2013), Tuntutuliak and Eek (Ikuta et al. 2016). These comprehensive surveys included questions about salmon and nonsalmon harvests as well as harvests of wildlife and plants. In addition, the division

conducted an ethnographic project to understand socioeconomic patterns and trends of subsistence Chinook salmon fishing in Tuntutuliak, Kwethluk, Kalskag, Sleetmute, and Nikolai in 2009 and in the Bethel area in 2012 (Ikuta et al. 2013). Studies focusing on the traditional ecological knowledge of nonsalmon fishes and nonsalmon harvest amounts have been conducted in Aniak and Chuathbaluk for 2001–2003 (Krauthoefer et al. 2007), Bethel for 2001–2003 (Simon et al. 2007b), Eek, Tuntutuliak, and Nunapitchuk for 2005–2009 (Ray et al. 2010), as well as Nikolai and Lime Village for 2012–2013 (Van Lanen and Runfola 2015). Information on historical and contemporary harvest and use of salmon and nonsalmon in communities along the Kuskokwim River, where data are available, can be accessed through the Community Subsistence Information System (CSIS) on the ADF&G website.

THE ROLE OF SALMON WITHIN ANNUAL SUBSISTENCE HARVESTS

As indicated by recent Division of Subsistence comprehensive harvest survey data, salmon provide a large portion of the total subsistence food supply in Kuskokwim River communities (Brown et al. 2012, 2013, Ikuta et al. 2014, 2016; Runfola et al. 2017). In 2012, the top 5 resources harvested by edible weight were moose at 20%, chum salmon at 12%, coho salmon at 11%, sockeye salmon at 10%, and Chinook salmon at 8% of the estimated total subsistence harvest by Bethel residents (Runfola et al. 2017). It is important to keep in mind that declines in Chinook salmon abundance have prompted subsistence fishing restrictions during the Chinook salmon fishing season in recent years. In 2012, for example, the total estimated Chinook salmon harvest in the Kuskokwim Area was 70% below the prior 10-year average Chinook salmon harvest for the region.

In other Lower Kuskokwim communities in 2010 (Oscarville, Kwethluk, Akiak, and Tuluksak) and 2011 (Napakiak and Napaskiak), the five most heavily harvested resources were Chinook salmon at 20%, chum salmon at 12%, and northern pike, sockeye salmon, and humpback whitefish in relatively similar proportions, each from 8 to 9% of the total subsistence harvest (Brown et al. 2013; Ikuta et al. 2014). Like people in Bethel, people living in other lower Kuskokwim communities rely on salmon and moose, yet they tend to harvest more nonsalmon fish species, such as northern pike and humpback whitefish, than people living in Bethel.

In the 8 Central Kuskokwim communities (Lower Kalskag, Upper Kalskag, Aniak, Chuathbaluk, Crooked Creek, Red Devil, Sleetmute, and Stony River), the 5 most heavily harvested resources in 2009 were Chinook salmon at 30% of the total subsistence harvest, chum salmon providing 15%, coho salmon at 12%, moose at 11%, and sockeye salmon at 8% of the total subsistence harvest (Brown et al. 2012). Like people in Lower Kuskokwim communities, residents of Central Kuskokwim River communities heavily rely on salmon and moose. These data demonstrate that, proportionally, Chinook salmon harvests make up a greater portion of the total annual subsistence harvest than in Lower Kuskokwim communities, 30% compared to 20%.

In the 3 Upper Kuskokwim communities (McGrath, Nikolai, and Takotna), the top 5 resources in 2012 were moose at 45%, Chinook salmon at 14%, coho salmon at 6%, and sheefish and northern pike both at 4% of the total subsistence harvest (Ikuta et al. 2014). People in Upper Kuskokwim communities are more dependent on moose than those in Lower and Central Kuskokwim communities. Yet, Chinook salmon was ranked as the second most harvested resource, demonstrating its importance to the overall subsistence economy of the Upper Kuskokwim region.

Table 5-1.–Subsistence salmon harvests by community, Kuskokwim Area, 2015.

Community	Households		Estimated salmon harvest					
	Total	Contacted	Chinook	Sockeye	Coho	Chum	Pink	Total
Kipnuk[a]	--	--	--	--	--	--	--	--
Kwigillingok[a]	--	--	--	--	--	--	--	--
Kongiganak[a]	90	0	--	--	--	--	--	--
North Kuskokwim Bay	**90**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Tuntutuliak	92	58	1,668	1,999	362	2,143	23	6,195
Eek	92	47	850	1,111	629	1,023	21	3,634
Kasigluk[b]	107	63	438	1,442	446	2,080	5	4,411
Nunapitchuk[b]	121	76	1,051	2,920	1,154	3,883	96	9,104
Atmautluak[b]	68	44	514	1,173	311	2,277	31	4,306
Napakiak[b]	99	48	917	1,179	1,117	1,513	47	4,773
Napaskiak[b]	104	62	816	2,041	1,353	2,240	32	6,482
Oscarville[b]	15	12	120	297	25	362	7	811
Bethel[c]	2,076	388	4,918	12,355	12,277	11,828	172	41,550
Kwethluk[b]	173	99	900	2,071	1,677	2,390	81	7,119
Akiachak[b]	157	104	1,103	2,551	1,924	2,085	58	7,721
Akiak[b]	87	45	610	1,856	1,423	2,385	189	6,463
Tuluksak	95	63	231	1,037	623	1,747	27	3,665
Lower Kuskokwim	**3,286**	**1,109**	**14,136**	**32,032**	**23,321**	**35,956**	**789**	**106,234**
Lower Kalskag[b]	74	42	351	492	419	1,341	31	2,634
Kalskag (Upper)[b]	62	36	334	726	384	742	28	2,214
Aniak[b]	180	92	542	2,408	7,705	1,412	305	12,372
Chuathbaluk	29	25	90	382	166	342	5	985
Middle Kuskokwim	**345**	**195**	**1,317**	**4,008**	**8,674**	**3,837**	**369**	**18,205**
Crooked Creek	31	24	78	303	275	383	2	1,041
Red Devil	9	4	52	88	214	48	0	402
Sleetmute	36	23	137	497	752	337	4	1,727
Stony River	13	11	25	91	77	44	0	237
Lime Village[a]	14	--	--	--	--	--	--	--
McGrath[b]	112	55	75	0	173	7	0	255
Takotna	21	16	3	0	53	0	0	56
Nikolai	36	31	301	400	400	2,000	4	3,105
Telida[a]	2	--	--	--	--	--	--	--
Upper Kuskokwim	**274**	**164**	**671**	**1,379**	**1,944**	**2,819**	**10**	**6,823**
Kuskokwim River	**3,995**	**1,468**	**16,124**	**37,419**	**33,939**	**42,612**	**1,168**	**131,262**
Quinhagak	73	96	3,082	1,065	2,238	691	46	7,122
Goodnews Bay	19	36	220	797	552	197	13	1,779
Platinum	262	15	11	148	87	16	5	267
South Kuskokwim Bay	**354**	**147**	**3,313**	**2,010**	**2,877**	**904**	**64**	**9,168**

-continued-

Table 5-1.–Page 2 of 2.

Community	Households		Estimated salmon harvest					
	Total	Contacted	Chinook	Sockeye	Coho	Chum	Pink	Total
Mekoryuk[a]	--	--	--	--	--	--	--	--
Newtok[a]	--	--	--	--	--	--	--	--
Nightmute[a]	--	--	--	--	--	--	--	--
Toksook Bay[a]	--	--	--	--	--	--	--	--
Tununak[a]	--	--	--	--	--	--	--	--
Chefornak[a]	--	--	--	--	--	--	--	--
Bering Sea Coast	--	--	--	--	--	--	--	--
Total	**4,349**	**1,615**	**19,437**	**39,429**	**36,816**	**43,516**	**1,233**	**140,431**

Source Shelden et al. (2016)

Note Includes harvests using rod and reel and the removal of salmon from commercial harvests as well as subsistence nets.

a. These communities were not contacted during the 2015 study period. Harvest was not estimated due to lack of recent data.

b. Estimate includes a tally of Chinook, chum and sockeye salmon harvested under the USFWS issued community permits.

c. The Bethel estimate contains permit numbers from Bethel and the seasonal village of Napaimute.

d. Kuskokwim River Total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

-- Data not available.

Table 5-2.–Subsistence salmon harvests in 7 coastal Kuskokwim communities, 2011.

	Households		Percent	Estimated salmon harvest						
Community	Total	Surveyed	surveyed	Chinook	Sockeye	Coho	Chum	Pink	Other[a]	Total
Chefornak	83	69	83.1%	161	261	61	338	13	5	839
Kipnuk	131	49	37.4%	479	1,160	781	716	11	0	3,147
Mekoryuk	59	54	91.5%	0	2	201	3670	47	0	3,920
Newtok	63	58	92.1%	144	394	262	103	46	0	949
Nightmute	50	40	80.0%	98	289	64	475	13	3	942
Toksook Bay	104	94	90.4%	365	1834	1040	1637	433	4	5,313
Tununak	68	36	52.9%	51	499	455	287	183	8	1,483
Total	**558**	**400**	**71.7%**	**1,298**	**4,439**	**2,864**	**7,226**	**746**	**20**	**16,593**

Source Wolfe et al. (2012:17–18)

a. Unidentified species of salmon.

Table 5-3.–Historical subsistence salmon harvests, Kuskokwim Area, 1989–2015.

Year	Households		Estimated salmon harvest					
	Total	Surveyed	Chinook	Sockeye	Coho	Chum	Pink[a]	Total
1989	3,422	2,135	85,322	37,088	57,786	145,106	--	325,302
1990	3,317	1,448	114,219	48,752	63,084	157,335	--	383,390
1991	3,340	2,033	79,445	50,383	44,222	89,008	--	263,058
1992	3,308	1,308	88,106	45,994	56,907	119,794	--	310,801
1993	3,269	1,786	92,305	53,442	32,207	64,966	--	242,920
1994	3,169	1,801	111,027	46,172	40,706	89,508	--	287,413
1995	3,638	1,907	105,805	32,019	39,492	72,054	--	249,370
1996	3,630	1,524	100,437	41,644	45,101	102,033	--	289,215
1997	3,501	1,919	83,000	39,868	31,293	38,419	--	192,580
1998	3,497	1,940	85,928	38,296	27,408	73,145	--	224,777
1999	4,165	2,512	80,545	51,321	27,757	52,414	--	212,037
2000	3,317	1,448	75,201	53,498	49,158	72,896	--	250,753
2001	4,469	2,215	81,927	55,163	33,031	57,410	--	227,531
2002	4,804	2,687	84,701	34,890	43,433	94,759	--	257,783
2003	4,513	2,292	70,375	34,772	37,242	47,949	--	190,338
2004	4,638	2,398	102,336	41,558	48,693	65,805	--	258,392
2005	4,603	1,593	90,311	44,933	35,170	59,762	1,343	231,519
2006	4,671	1,439	96,733	47,763	43,211	93,091	2,710	283,508
2007	4,620	1,279	100,297	49,613	35,890	76,281	1,259	263,340
2008	4,735	949	92,977	56,205	47,476	66,275	1,341	264,274
2009	4,808	1,702	83,838	38,795	31,933	46,047	561	201,174
2010	4,215	1,739	70,576	41,722	35,695	46,797	751	195,541
2011	4,241	1,790	65,850	46,290	33,943	55,990	739	202,812
2012	4,294	1,527	25,353	50,781	30,086	82,030	2,160	190,410
2013	4,314	1,755	50,708	42,834	27,841	55,828	741	177,952
2014	4,229	1,862	15,434	53,030	52,587	70,687	2,620	194,358
2015	4,349	1,615	19,437	39,429	36,816	43,516	1,233	140,431
5-year average (2010–2014)	4,259	1,735	45,584	46,931	36,030	62,266	1,402	192,215
10-year average (2005–2014)	4,473	1,564	69,208	47,197	37,383	65,279	1,423	220,489
15-year average (2000–2014)	4,431	1,778	73,774	46,123	39,026	66,107	NA	225,979
Historical average (1989–2014)	4,028	1,807	82,029	45,263	40,437	76,746	1,423	245,021

Source Shelden et al. (2016)

a. Prior to 2008, harvest estimates for pink salmon were calculated by ADF&G Division of Subsistence

-- Data not available.

Table 5-4.–Number of households that own dogs, fed salmon to dogs, and total number of salmon fed to dogs, Kuskokwim Area, 2014.

Community	Households		Households		Total number of dogs	Reported salmon fed to dogs					
	Total	Contacted	Own dogs	Fed salmon		Chinook	Sockeye	Coho	Chum	Pink	Total
Kipnuk[a]	--	--	--	--	--	--	--	--	--	--	--
Kwigillingok[a]	--	--	--	--	--	--	--	--	--	--	--
Kongiganak	90	0	--	--	--	--	--	--	--	--	--
North Kuskokwim Bay	**90**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Tuntutuliak	92	58	45	0	105	0	0	0	0	0	0
Eek	92	47	31	0	53	0	0	0	0	0	0
Kasigluk	107	63	48	0	104	0	0	0	0	0	0
Nunapitchuk	121	76	52	1	96	0	0	0	15	0	15
Atmautluak	68	44	38	0	102	0	0	0	0	0	0
Napakiak	99	48	31	0	58	0	0	0	0	0	0
Napaskiak	104	62	38	3	111	0	220	0	60	20	300
Oscarville	15	12	6	0	12	0	0	0	0	0	0
Bethel	2,076	388	163	2	288	0	0	0	18	0	18
Kwethluk	173	99	73	1	194	0	0	0	0	4	4
Akiachak	157	104	57	3	146	0	240	0	40	20	300
Akiak	87	45	31	2	144	0	0	50	200	12	262
Tuluksak	95	63	45	1	93	0	0	0	50	0	50
Lower Kuskokwim	**3,286**	**1,109**	**658**	**13**	**1,506**	**0**	**460**	**50**	**383**	**56**	**949**
Lower Kalskag	74	42	34	1	70	0	29	0	80	0	109
Kalskag (Upper)	62	36	21	1	69	0	0	0	100	0	100
Aniak	180	92	62	5	202	0	1,922	33	180	110	2,245
Chuathbaluk	29	25	22	0	41	0	0	0	0	0	0
Middle Kuskokwim	**345**	**195**	**139**	**7**	**382**	**0**	**1,951**	**33**	**360**	**110**	**2,454**
Crooked Creek[a]	31	24	16	0	26	0	0	0	0	0	--
Red Devil	9	4	3	0	6	0	0	0	0	0	0
Sleetmute	36	23	13	4	27	0	263	0	141	0	404

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Table 5-4.–Page 2 of 2.

Community	Households		Households		Total number of dogs	Reported salmon fed to dogs					
	Total	Contacted	Own dogs	Fed salmon		Chinook	Sockeye	Coho	Chum	Pink	Total
Stony River	13	11	5	0	8	0	0	0	0	0	0
Lime Village[a]	14	--	–	–	–	–	–	–	–	–	--
McGrath	112	55	27	0	60	0	0	0	0	0	0
Takotna[a]	21	16	9	0	22	0	0	0	0	0	--
Nikolai	36	31	19	1	78	25	195	200	1,000	2	1,422
Telida[a]	2	--	–	–	–	–	–	–	–	–	--
Upper Kuskokwim	**274**	**164**	**92**	**5**	**227**	**25**	**458**	**200**	**1,141**	**2**	**1,826**
Kuskokwim River	**3,995**	**1,468**	**889**	**25**	**2,115**	**25**	**2,869**	**283**	**1,884**	**168**	**5,229**
Quinhagak	73	96	64	2	99	4	0	0	15	0	19
Goodnews Bay	19	36	18	0	30	0	0	0	0	0	0
Platinum	262	15	9	1	23	0	0	0	0	1	1
South Kuskokwim Bay	**354**	**147**	**91**	**3**	**152**	**4**	**0**	**0**	**15**	**1**	**20**
Mekoryuk[a]	--	--	--	--	--	--	--	--	--	--	--
Newtok[a]	--	--	--	--	--	--	--	--	--	--	--
Nightmute[a]	--	--	--	--	--	--	--	--	--	--	--
Toksook Bay[a]	--	--	--	--	--	--	--	--	--	--	--
Tununak[a]	--	--	--	--	--	--	--	--	--	--	--
Chefornak[a]	--	--	--	--	--	--	--	--	--	--	--
Bering Sea Coast	--	--	--	--	--	--	--	--	--	--	--
Total	**4,349**	**1,615**	**980**	**28**	**2,267**	**29**	**2,869**	**283**	**1,899**	**169**	**5,249**

Source Shelden et al. (2016)

Note Includes harvests using rod and reel and the removal of salmon from commercial harvests as well as subsistence nets.

a. These communities were not contacted during the 2015 study period.

-- Data not available.

Table 5-5.–Gear types used for subsistence fishing, Kuskokwim Area, 2015.

Community	Total households[c]	Gear types[a] Setnet	Driftnet	Rod and reel	Fish wheel
Kipnuk[b]	--	--	--	--	--
Kwigillingok[b]	--	--	--	--	--
Kongiganak[b]	--	--	--	--	--
North Kuskokwim Bay	**0**	**0**	**0**	**0**	**0**
Tuntutuliak	41	15	26	--	--
Eek	25	3	21	1	--
Kasigluk	35	--	35	--	--
Nunapitchuk	50	3	47	--	--
Atmautluak	32	--	32	--	--
Napakiak	30	4	26	--	--
Napaskiak	41	16	24	1	--
Oscarville	7	1	6	--	--
Bethel	130	4	110	16	--
Kwethluk	56	9	43	4	--
Akiachak	71	15	55	1	--
Akiak	30	14	14	2	--
Tuluksak	35	15	17	3	--
Lower Kuskokwim	**583**	**99**	**456**	**28**	**0**
Lower Kalskag	22	5	17	--	--
Kalskag (Upper)	21	5	16	--	--
Aniak	59	5	22	30	2
Chuathbaluk	16	1	12	2	1
Middle Kuskokwim	**118**	**16**	**67**	**32**	**3**
Crooked Creek[b]	14	--	12	2	--
Red Devil	4	1	--	3	--
Sleetmute	16	4	12	--	--
Stony River	6	4	--	1	1
Lime Village[b]	--	--	--	--	--
McGrath	10	8	--	2	--
Takotna[b]	2	--	--	2	--
Nikolai	10	6	--	4	--
Telida[b]	--	--	--	--	--
Upper Kuskokwim	**62**	**23**	**24**	**14**	**1**
Kuskokwim River	**763**	**138**	**547**	**74**	**4**
Quinhagak	72	4	38	30	--
Goodnews Bay	24	8	10	6	--
Platinum	7	2	--	5	--
South Kuskokwim Bay	**103**	**14**	**48**	**41**	**0**
Mekoryuk[b]	--	--	--	--	--

-continued-

Table 5-5.–Page 2 of 2.

Community	Total households[c]	Gear types[a]			
		Setnet	Driftnet	Rod and reel	Fish wheel
Newtok[b]	--	--	--	--	--
Nightmute[b]	--	--	--	--	--
Toksook Bay[b]	--	--	--	--	--
Tununak[b]	--	--	--	--	--
Chefornak[b]	--	--	--	--	--
Bering Sea Coast	--	--	--	--	--
Total	**866**	**152**	**595**	**115**	**4**

Source Shelden et al. (2016)

a. Only data regarding the primary gear type from each household was collected.

b. Community was not contacted during the 2015 study period.

c. Number of households responding to the question about their primary gear type.

-- Data not available.

Table 5-6.–Reported number of salmon retained from commercial harvest for subsistence use, Kuskokwim Area, 2015.

Community	Households		Reported salmon					
	Total	Responding	Chinook	Sockeye	Coho	Chum	Pink	Total
Kipnuk[a]	--	--	--	--	--	--	--	--
Kwigillingok[a]	--	--	--	--	--	--	--	--
Kongiganak[a]	90	0	--	--	--	--	--	--
North Kuskokwim Bay	**90**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Tuntutuliak	92	58	51	60	17	50	0	178
Eek	92	47	0	0	0	0	0	0
Kasigluk	107	63	3	0	1	1	0	5
Nunapitchuk	121	74	0	0	95	0	0	95
Atmautluak	68	44	0	0	31	0	0	31
Napakiak	99	48	0	3	0	0	0	3
Napaskiak	104	62	23	13	0	0	0	36
Oscarville	15	12	0	0	0	0	0	0
Bethel	2,076	388	16	0	21	0	5	42
Kwethluk	173	99	0	0	0	0	0	0
Akiachak	157	104	10	0	0	6	0	16
Akiak	87	45	0	0	0	0	0	0
Tuluksak	95	63	0	0	0	0	0	0
Lower Kuskokwim	**3,286**	**1,107**	**103**	**76**	**165**	**57**	**5**	**406**
Lower Kalskag	74	42	0	0	0	0	0	0
Kalskag (Upper)	62	36	0	0	0	0	0	0
Aniak	180	92	0	0	0	0	0	0
Chuathbaluk	29	25	0	0	0	0	0	0
Middle Kuskokwim	**345**	**195**	**0**	**0**	**0**	**0**	**0**	**0**
Crooked Creek[a]	31	24	0	0	0	0	0	0
Red Devil	9	4	--	--	--	--	--	--
Sleetmute	36	23	0	0	0	0	0	0
Stony River	13	11	0	0	0	0	0	0
Lime Village[a]	14	--	--	--	--	--	--	--
McGrath	112	55	0	0	0	0	0	0
Takotna[a]	21	16	0	0	0	0	0	0
Nikolai	36	31	0	0	0	0	0	0
Telida[a]	2	--	--	--	--	--	--	--
Upper Kuskokwim	**274**	**164**	**0**	**0**	**0**	**0**	**0**	**0**
Kuskokwim River	**3,995**	**1,466**	**103**	**76**	**165**	**57**	**5**	**406**
Quinhagak	170	96	66	12	62	4	20	164
Goodnews Bay	73	36	11	22	0	0	0	33
Platinum	19	15	1	1	1	0	0	3
South Kuskokwim Bay	**262**	**147**	**78**	**35**	**63**	**4**	**20**	**200**

-continued-

Table 5-6.–Page 2 of 2.

Community	Households		Reported salmon					
	Total	Responding	Chinook	Sockeye	Coho	Chum	Pink	Total
Mekoryuk[a]	--	--	--	--	--	--	--	--
Newtok[a]	--	--	--	--	--	--	--	--
Nightmute[a]	--	--	--	--	--	--	--	--
Toksook Bay[a]	--	--	--	--	--	--	--	--
Tununak[a]	--	--	--	--	--	--	--	--
Chefornak[a]	--	--	--	--	--	--	--	--
Bering Sea Coast	--	--	--	--	--	--	--	--
Total	**4,257**	**1,613**	**181**	**111**	**228**	**61**	**25**	**606**

Source Shelden et al. (2016)
a. These communities were not contacted during the 2015 study period.
-- Data not available.

Table 5-7.–Subsistence nonsalmon fish harvests by community, Kuskokwim Area, 2015.

Community	Households		Reported nonsalmon fish harvest												
	Total	Contacted	Humpback whitefish	Broad whitefish	Cisco	Sheefish	Burbot	Alaska blackfish	Smelt	Northern pike	Pacific herring	Arctic grayling	Dolly Varden (char)	Rainbow trout	Total
Kipnuk[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Kwigillingok[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Kongiganak[a]	90	0	--	--	--	--	--	--	--	--	--	--	--	--	--
North Kuskokwim Bay	**90**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Tuntutuliak	92	58	674	764	51	0	594	2,400	17,474	0	32	0	313	0	--
Eek	92	47	725	449	164	37	534	1,190	13,327	2	4	1,595	1,175	29	19,231
Kasigluk	107	63	4,570	5,000	239	23	228	5,239	10,841	0	6	0	2,277	0	28,423
Nunapitchuk	121	76	4,903	3,859	558	138	550	5,573	28,507	0	0	0	2,845	2	46,935
Atmautluak	68	44	1,472	2,194	733	72	480	2,868	9,310	0	9	0	4,987	2	22,127
Napakiak	99	48	1,502	1,154	125	385	954	8,987	4,705	0	28	1,950	6,750	32	26,572
Napaskiak	104	62	3,760	514	632	808	1,129	3,712	11,634	3	101	0	5,568	24	27,885
Oscarville	15	12	119	32	27	24	54	1,171	1,688	0	0	0	1,152	2	4,269
Bethel	2,076	388	4,288	1,745	3,036	715	5,798	20,441	34,284	80	767	108	79,886	242	151,390
Kwethluk	173	99	629	526	297	101	1,539	3,854	16,021	52	32	0	8,022	40	31,113
Akiachak	157	104	1,330	691	215	485	2,937	4,522	36,078	55	46	271	17,644	24	64,298
Akiak	87	45	2,154	2,206	2,230	441	2,121	1,816	6,510	112	139	0	16,997	108	34,834
Tuluksak	95	63	491	305	188	49	196	1,072	5,601	38	62	79	4,705	21	12,807
Lower Kuskokwim	**3,286**	**1,109**	**26,617**	**19,439**	**8,495**	**3,278**	**17,114**	**62,845**	**195,980**	**342**	**1,226**	**4,003**	**152,321**	**526**	**492,186**
Lower Kalskag	74	42	231	78	0	63	102	98	2,058	0	0	0	1,688	0	4,318
Kalskag (Upper)	62	36	123	39	0	32	18	122	679	0	0	0	0	1	1,014
Aniak	180	92	1,223	1,792	6,257	232	182	216	0	101	130	0	3,050	78	13,261
Chuathbaluk	29	25	165	19	0	33	112	12	0	0	51	0	0	0	392
Middle Kuskokwim	**345**	**195**	**1,742**	**1,928**	**6,257**	**360**	**414**	**448**	**2,737**	**101**	**181**	**0**	**4,738**	**79**	**18,985**
Crooked Creek[a]	31	24	49	99	126	100	11	18	0	91	69	0	0	2	565
Red Devil	9	4	0	0	0	23	0	36	0	58	16	0	0	0	133

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Table 5-7.–Page 2 of 2.

Community	Households		Reported nonsalmon fish harvest												
	Total	Contacted	Humpback whitefish	Broad whitefish	Cisco	Sheefish	Burbot	Alaska blackfish	Smelt	Northern pike	Pacific herring	Arctic grayling	Dolly Varden (char)	Rainbow trout	Total
Sleetmute	36	23	405	176	708	99	10	67	0	573	0	0	0	0	2,038
Stony River	13	11	45	17	0	8	28	6	0	0	0	0	0	0	104
Lime Village[a]	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--
McGrath	112	55	105	157	5	262	97	467	1,407	796	0	0	0	0	3,296
Takotna[a]	21	16	0	0	0	0	0	8	3	43	0	0	0	0	--
Nikolai	36	31	363	180	1,203	144	8	1,051	0	102	2	0	0	0	3,053
Telida[a]	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Upper Kuskokwim	**274**	**164**	**967**	**629**	**2,042**	**636**	**154**	**1,653**	**1,410**	**1,663**	**87**	**0**	**0**	**2**	**9,243**
Kuskokwim River	**3,995**	**1,468**	**29,326**	**21,996**	**16,794**	**4,274**	**17,682**	**64,946**	**200,127**	**2,106**	**1,494**	**4,003**	**157,059**	**607**	**520,414**
Quinhagak	73	96	729	386	1,041	5	34	360	9,053	267	4,305	2,521	10,398	338	29,437
Goodnews Bay	19	36	24	0	137	4	0	0	27	43	1,898	1,149	3,828	41	7,151
Platinum	262	15	0	0	101	0	0	0	0	43	485	251	419	6	1,305
South Kuskokwim Bay	**354**	**147**	**753**	**386**	**1,279**	**9**	**34**	**360**	**9,080**	**353**	**6,688**	**3,921**	**14,645**	**385**	**37,893**
Mekoryuk[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Newtok[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nightmute[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Toksook Bay[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tununak[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chefornak[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bering Sea Coast	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	**4,349**	**1,615**	**30,079**	**22,382**	**18,073**	**4,283**	**17,716**	**65,306**	**209,207**	**2,459**	**8,182**	**7,924**	**171,704**	**992**	**558,307**

Source Shelden et al. (2016)

a. These communities were not contacted during the 2015 study period.

-- Data not available.

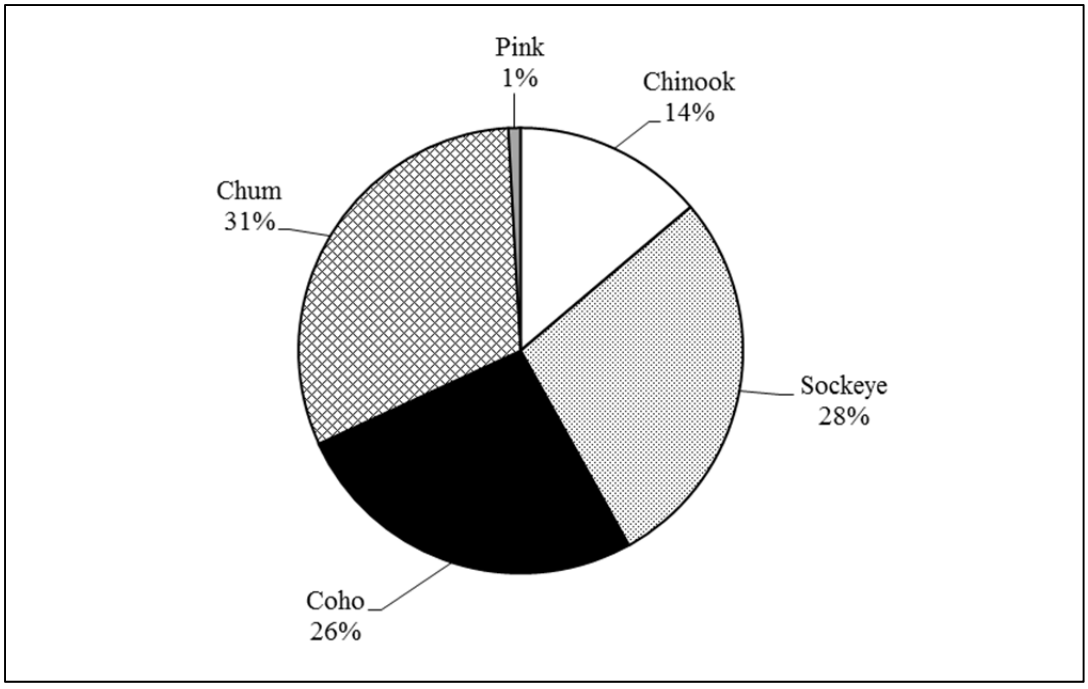

Figure 5-1.–Kuskokwim subsistence salmon harvest composition, 2015.

CHAPTER 6: BRISTOL BAY AREA

BACKGROUND

In spite of numerous social, economic, environmental, and technological changes, Bristol Bay residents continue to depend on salmon and other fish species as an important source of food. Subsistence harvests still provide important nutritional, economic, and sociocultural benefits to most Bristol Bay households. The 5 species of salmon found in Alaska are utilized for subsistence purposes in Bristol Bay, but the most popular are sockeye, Chinook, and coho salmon. Many residents continue to preserve large quantities of fish through traditional methods, such as drying and smoking, and fish are also frozen, canned, salted, pickled, fermented, and eaten fresh.

REGULATIONS

Permits are required to harvest salmon for subsistence purposes in Bristol Bay. Standard permit conditions include prohibition of fishing within 300 ft of a dam, fish ladder, weir, culvert, or other artificial obstruction. Since 1990, under state regulations, all Alaska state residents have been eligible to participate in subsistence salmon fishing in all Bristol Bay drainages. From 1998 through 2006, with 3 exceptions, only gillnets were recognized as legal subsistence gear. The first exception occurred in the Togiak District, where spear fishing was also allowed. Second, in 1998 the BOF adopted new regulations for the taking of "redfish" (postspawn sockeye salmon) in portions of the Naknek District. Thirdly, at their 2006 meeting, the BOF adopted regulations stating that beach seines are allowed in Iliamna Lake, Six Mile Lake, and Lake Clark. Gillnets, spears, and dip nets may be used along a 100 yd length of the west shore of Naknek Lake near the outlet to the Naknek River from August 30 through September 30, at Johnny's Lake from August 15 through September 15, and at the mouth of the Brooks River at Naknek Lake from October 1 through November 15. Nets are limited to 5 fathoms in the special "redfish" harvest areas in the Naknek District. In the Bristol Bay Area in 2015, gillnet lengths were limited to 10 fathoms in the Naknek, Egegik, and Ugashik rivers; Dillingham beaches; and within the Nushagak commercial district during emergency openings. A 25 fathom net may be used in waters of the Wood River and the Nushagak River located upstream from a regulatory line from an ADF&G marker at Nushagak Point to another ADF&G marker located at Snag Point. On the north shore of Naknek River, approximately 300 feet upstream from the north commercial fishing boundary to 1,300 feet upstream from the north commercial section boundary, salmon may be taken only by a person 60 years of age or older from June 23 through July 17. Along the Dillingham beaches, and in the Naknek, Egegik, and Ugashik rivers, subsistence fishing was limited to several fishing periods per week during the peak of the sockeye salmon run. All commercial districts were open for subsistence fishing during commercial openings. In addition, all commercial districts were open for subsistence fishing in May and October, from Monday to Friday. A weekend subsistence open time allowed for subsistence fishing from 9:00 am Saturday to 9:00 am Sunday. In the late 1990s and early 2000s, declining Chinook salmon and coho salmon stocks resulted in longer commercial closures, and some residents had difficulty obtaining fish for home uses. Since 2004, there have been improvements in abundance of all species (Jones et al. 2009:20). Since 1988, the Nushagak commercial district has been open to subsistence fishing by emergency order during extended commercial closures.

In May 2001, the National Park Service (NPS) announced that it would begin enforcing the prohibition of subsistence fishing with nets in Lake Clark National Park and Preserve, including all of Lake Clark, except by federally qualified area rural residents. This was a new enforcement action of an existing NPS regulation and was applied to individuals who were not permanent residents of Iliamna, Lime Village, Newhalen, Nondalton, Pedro Bay, or Port Alsworth, or who did not have a Section 13.44 subsistence use permit issued by the park superintendent.

ADF&G has continued to issue Bristol Bay subsistence salmon permits to those Alaska residents who request them. However, ADF&G informs permit applicants that unless they live in one of the above-named communities or have a Section 13.44 permit, they need to take this NPS closure into account when they subsistence fish in waters of the park and preserve. ADF&G also informs permittees that waters outside of national park and preserve boundaries remain open for subsistence salmon fishing to all permit holders.

INSEASON MANAGEMENT IN 2015

From June 1 through September 30 in all waters of a commercial salmon district within the Bristol Bay region, subsistence salmon could be taken only during commercial fishing periods. For a list of 2015 commercial fishing emergency orders for Bristol Bay in commercial districts, see Table 7 in Jones et al. (2016:32). In the Nushagak District, subsistence salmon fishing was provided for by emergency order during periods of extended commercial fishing closures.

SALMON HARVEST ASSESSMENT PROGRAM

A permit program was gradually introduced throughout the Bristol Bay region in the late 1960s to document the harvest of salmon for subsistence uses. Much of the increase in the number of permits issued during these years reflects: 1) a greater compliance with the permitting and reporting requirements, 2) an increased level of effort expended by ADF&G in making permits available (including issuance by area vendors), 3) contacting individuals to remind them to return the harvest forms, and 4) a growing regional population. Most fishers are obtaining permits and reporting their harvests, and overall permit returns have averaged between 85% and 90%. However, fish removed for home uses from commercial catches are not included in most reported subsistence harvest totals. Also, fish caught later in the season, such as coho salmon and spawning sockeye salmon, are probably not documented as consistently as Chinook and prespawn sockeye salmon.

In 2015, a total of 1,169 permits were issued for the Bristol Bay Management Area; of those 1,072, or 92%, were returned (Table 6-1; Table 6-2). The largest number of permits were issued for the Nushagak (591 permits) and Naknek–Kvichak (486 permits) districts (Table 6-1). The number of permits issued in 2015 was slightly above the 5-year (1,126 permits), the 10-year (1,106 permits), and the historical (1,097 permits) averages (Table 6-2).

SUBSISTENCE SALMON HARVESTS IN 2015

Estimated total Bristol Bay subsistence salmon harvests in 2015 were 125,100 fish. The 2015 salmon harvest was above the 5-year (124,621 salmon), but below the 10-year (125,953 salmon) averages, and below the historical average (1983–2014) of 145,144 salmon (Table 6-2).

Chinook salmon harvests were estimated at 13,874 in 2015, a decrease from the previous year's harvest of 17,417. Estimated sockeye salmon harvests for 2015 were 99,535, which was an increase from the previous year's harvest of 99,008fish. The 2015 sockeye harvest was slightly higher than recent 5-year average of 97,993 fish and above the 10-year average of 98,576 fish. The historical average (1983–2014) was 113,613 fish. Because the return of pink salmon to Bristol Bay is lower in odd-numbered years than even-numbered years, the number of pink salmon was lower in 2015 (458 fish) than in 2014 (2,689 fish). The estimated harvest of chum salmon in 2015 (3,573 fish) was lower than the recent 5-year (4,869 fish), 10-year average (5,052 fish) and the historical average (1983–2014) of 6,366 (fish. The coho salmon harvest in 2015 (7,659 fish) was slightly lower than the previous year (8,984 fish) but higher than the 5-year average at 6,714 fish, the 10-year average at 6,765(Table 6-2), and the historical average (1983–2015) at 8,210 fish.

In 2015, the Bristol Bay subsistence salmon harvest was composed of 80% sockeye salmon, 11% Chinook salmon, 6% coho salmon, 3% chum salmon, and 1% pink salmon (Figure 6-1). Of the entire

Bristol Bay Area subsistence salmon harvest in 2015, residents of Bristol Bay communities harvested 108,558 salmon (87%), and other Alaska residents harvested 16,215 salmon (13%) (Table 6-3).

In 2015, as over the last several decades, most of the Bristol Bay Area subsistence harvest was taken in the Naknek–Kvichak (57%) and the Nushagak (37%) districts (Figure 6-2). The remaining portion was taken in the Togiak district (3%), and the Egegik and Ugashik districts, each at 1% (Figure 6-2). The Naknek–Kvichak total harvest of 71,583 salmon in 2015 (Table 6-1) was higher than in 2014 (67,603 salmon), and higher than the 2013 harvest (63,535 salmon). Kvichak River drainage residents within the Kvichak River–Iliamna Lake Subdistrict and other permit holders fishing in the Kvichak drainage portion of the Naknek–Kvichak District harvested an estimated 70 Chinook salmon and 39,279 sockeye salmon in 2015 while those fishing in the Naknek River Subdistrict harvested 604 Chinook salmon and 30,305 sockeye salmon (Table 6-1). The 2015 subsistence harvest of 39,377 sockeye salmon in the Kvichak drainage (Table 6-1) was lower than the 2014 harvest of 41,016 and lower than the 2013 harvest of 42,556 sockeye salmon (Jones et al. 2016:100).

Subsistence sockeye salmon harvests in the Kvichak District have declined since the early 1990s (Salomone et al. 2011:113). From 1998 to 2013, estimated harvests were below the range of 55,000 to 65,000 sockeye salmon established by the BOF as the amount reasonably necessary for subsistence uses (5 AAC 01.336 (b)(1)).

In the Nushagak District, the total estimated subsistence harvest in 2015 of 46,248 salmon (Table 6-1) was a decrease from the previous year (58,425 salmon). The estimated harvest in 2014 of 58,425 salmon was the highest since 55,159 salmon in 1994 (Jones et al. 2014:97). The 2008 estimated harvest more completely recorded harvest numbers for the season due to the administration of comprehensive baseline household subsistence harvest surveys by the Division of Subsistence in Aleknagik and Manokotak. For a more detailed description of these data see Fall et al. (2012:75). The Nushagak District Chinook salmon harvest in 2015 was 12,117 (Table 6-1), and was an increase from the previous two years of 16,049 salmon in 2014, and 11,602 salmon in 2013. The lowest estimated Chinook harvests in the Nushagak District were 9,150 salmon in 2010 and 9,971 salmon in 2006 (Jones et al. 2014:94). The 2015 Nushagak District sockeye salmon harvest of 25,240 fish was lower than the previous study year (27,240 salmon) (Table 6-1), with the highest harvest being in 1999, at 29,387 subsistence sockeye harvested (Jones et al. 2014:94).

The estimated total subsistence salmon harvest for the Togiak District in 2015, 4,249 fish (Table 6-1), was lower than the previous year's estimate of 6,539 fish, and lower than the 2013 season (5,002 salmon) (Jones et al. 2014:95). Estimated harvests in 2002 and from 2004 through 2007 were below those for 2001 and 2003; this likely reflects at least in part the result of postseason household surveys in Togiak and Twin Hills for 2001 and 2003. Postseason household surveys included more harvesters in the estimate because fishers who did not turn in their harvest permits, or obtain permits, were contacted. Comprehensive baseline household subsistence harvest surveys conducted in Togiak for the 2008 calendar year also showed an increase in the participation in the 2008 harvest assessment program.

The estimated subsistence salmon harvest in the Ugashik District in 2015 was 1,214 fish, which was higher than the previous year at 842, and about twice as high as the 2013 season (672 fish) (Table 6-1). The 2015 harvest was just slightly above the 10-year average (2005–2014) of 1,179 fish (Jones et al. 2016:98). In the Egegik District, the 2015 estimated subsistence salmon harvest of 1,806 fish (Table 6-1) was higher than the 2014 estimate of 1,366 but lower than the 2013 estimate of 2,380 fish. The 2015 estimate was notably lower than the 4,711 fish estimated for 2004 (the second highest estimate since 1984), and was less than the 10-year (2005–2014) average of 1,951 salmon (Jones et al. 2016:97).

OTHER SUBSISTENCE FISHERIES

In May 2003, new federal regulations authorizing subsistence fishing for Pacific halibut came into effect. A harvest assessment program for the subsistence halibut fishery was implemented in 2004. Subsistence

halibut harvest estimates for 2014 appear in Fall and Lemons (2016). Beginning in 2003 subsistence fishing for rainbow/steelhead trout *O. mykiss* and Arctic char/Dolly Varden in the Bristol Bay Area under federal subsistence regulations required a federal permit. No permits were issued (Michael Edwards, Fisheries Biologist, USFWS, King Salmon Field Office, personal communication, 2004). The permit requirement was dropped in 2005. The following overview derives primarily from Fall and Chythlook (1997) and Fall et al. (2009).

Subsistence Regulations

The BOF determined that all finfishes of the Bristol Bay Management Area support customary and traditional uses (5 AAC 01.336). In 1993 the BOF determined that a range of 157,000-172,171 salmon are the amount necessary to provide a reasonable opportunity for subsistence. In addition, the BOF determined that approximately 250,000 usable pounds of finfish other than salmon (about 41 lb per person) was the amount reasonably necessary to provide for these uses. This amount was based upon estimates of fish harvests derived from systematic household surveys conducted by the Division of Subsistence. Amounts for specific species or more specific stocks were not established.

For the most part, subsistence fishing for species other than salmon and rainbow/steelhead trout is open year-round in the Bristol Bay Area with gear listed in 5 AAC 01.010 (a). There are no seasonal limits established by regulation. The following regulations apply to subsistence fishing for species other than salmon in the area:[1]

Rainbow/steelhead trout taken incidentally in other subsistence net fisheries and through the ice are lawfully taken and may be retained for subsistence uses (5 AAC 01.310 (g)).

Subsistence fishing with a line attached to a rod or pole is prohibited except when fishing through the ice (5 AAC 01.320 (l)).

Subsistence fishing with nets is prohibited in 18 waters of the Kvichak–Iliamna Lake drainage and within one-quarter mile of the terminus of those waters from September 1 through June 14.

Subsistence Harvests and Uses

A detailed description of subsistence uses of freshwater fishes in the Bristol Bay Area appears in Fall et al. (1996) and Holen and Lemons (2012). Holen et al. (2012) and Wright and Chythlook (1985) describe the uses of herring spawn on kelp in the Togiak District. Harvests of fish other than salmon contribute about 10% of the annual subsistence harvests of wild foods in the Bristol Bay region, about 41 lb per person (Fall, Krieg, et al. 2009; Holen and Lemons 2012).

Subsistence harvests of fish other than salmon are not annually monitored by ADF&G. Harvest and use data are available for most communities through Division of Subsistence household harvest surveys (BBNA and ADF&G 1996; Coiley-Kenner et al. 2003; Evans et al. 2013; Fall et al. 2006; Holen et al. 2011; Holen, Stariwat, et al. 2012; Krieg et al. 2005, 2009). As part of an OSM project (02-034, Subsistence Fisheries Assessment: Kvichak River Watershed Resident Species), the Division of Subsistence and the Bristol Bay Native Association collected subsistence harvest data in Kvichak River watershed communities from October 2002 to September 2003. The final report for that project (T. Krieg et al. 2005) includes detailed information about uses of nonsalmon fish in 8 study communities. Some of the findings of ADF&G research regarding nonsalmon fish are summarized in Table 6-4. The vast majority of households in the Bristol Bay Area use fish other than salmon for subsistence purposes. Most households also participate in the harvest of these fish. Harvests, as measured in pounds usable weight per person for available study years, vary from community to community and from year to year, but generally make important contributions to annual subsistence harvests. Fish other than salmon generally rank third

1. In 2004, the BOF eliminated a permit requirement for subsistence fishing for rainbow/steelhead trout and Arctic char/Dolly Varden in the Bristol Bay Area. ADF&G had not developed a program for issuing these permits.

behind salmon and land mammals in their contribution to the total subsistence harvests in Bristol Bay communities.

Harvests and uses of the nonsalmon fish listed in Table 6-5 have been documented in Bristol Bay communities through Division of Subsistence research. Uses of other species may occur: fish taken in the largest quantities in the area as a whole include smelt, whitefishes, Dolly Varden, Arctic grayling, and northern pike (see Fall et al. [1996] for a summary of harvest data).

In the Bristol Bay Area, harvests of nonsalmon finfish occur throughout the year. Harvest effort for these fish is generally lower among Bristol Bay residents in the summer because attention is focused on salmon. Spring is important for herring, herring spawn on kelp, and rainbow smelt.

Harvests of nonsalmon fish occur in winter. "Smelting" is a popular activity in October and in late winter when these fish can be caught by jigging. Halibut are mostly taken in June and July (Wright, Morris, and Schroeder 1985:34).

Many gear types are used to harvest nonsalmon fish for home uses in the Bristol Bay Area. Rod and reel is used for most fish; some, such as Arctic char/Dolly Varden and herring and other marine fishes, are removed from commercial catches. Other methods are used, including (but not necessarily limited to) the following:

Traps (fyke nets): Alaska blackfish, burbot;

Set lines: burbot;

Handline jigging through the ice: Arctic grayling, Arctic char/Dolly Varden, lake trout, rainbow smelt, rainbow/steelhead trout, whitefishes, northern pike;

Set gillnets: Arctic grayling, Arctic char/Dolly Varden, lake trout, longnose suckers, rainbow/steelhead trout, herring, northern pike, burbot, whitefishes;

Beach seining: Arctic char/Dolly Varden, lake trout, rainbow smelt, herring, whitefishes;

Hand line in open water: Pacific halibut, rainbow/steelhead trout; and

Dip nets: rainbow smelt, herring.

Herring spawn on kelp is usually picked by hand, although rakes, knives, and *uluaqs* (women's knives) are also used (Schichnes and Chythlook 1988:127).

Maps of areas used by Bristol Bay communities to harvest nonsalmon fish appear in the *Alaska Habitat Management Guide Reference Atlas* series (ADF&G 1985), and in Wright et al. (1985). Updated maps of harvest locations for 8 communities in the Kvichak watershed appear in Krieg et al. (2005). Harvest activities occur throughout the region in most rivers and lakes as well as along shorelines. It is likely that most effort occurs near each community and near seasonal camps such as Kulukak. See Wright and Chythlook (1985) and Schichnes and Chythlook (1988) for maps of herring camps at Kulukak Bay. For frequency of uses of various areas for freshwater fishing by Nushagak River communities, see Schichnes and Chythlook (1991) and by Togiak and Manokotak, see BBNA and ADF&G (BBNA and ADF&G 1996).

Bristol Bay residents use a wide variety of methods to process and preserve their harvests of fish other than salmon. These vary by species and community. Some freezing of harvests of most species occurs. Some examples of other methods include the following:

Arctic grayling: dried, half-dried, fresh frozen, aged frozen and eaten with seal oil (various species);

Dolly Varden: dried, smoked, half dried (*egamaarrluk*);

Northern pike: dried, half-dried, fresh frozen, aged frozen and eaten with seal oil;

Rainbow/steelhead trout: dried, half dried, smoked; and

Whitefishes: dried, fresh frozen, aged frozen and eaten with seal oil.

Dried fish products are eaten with seal oil. Fat from brown bears *Ursus arctos* mixed with dry fish is also consumed. Rainbow smelt are fried, boiled, dried, or eaten frozen with seal oil (Fall et al. 1986:100; Fall, Krieg, et al. 2009). Herring are salted, or split, dried, and smoked (Schichnes and Chythlook 1988:126). The heads and stomachs of northern pike are boiled and eaten (Schichnes and Chythlook 1991:139). Freshwater fish that are usually eaten frozen with seal oil form a category called *kumlaneq*. This includes Arctic grayling, whitefishes, lake trout, and northern pike (Fall et al. 1986:102; Fall, Krieg, et al. 2009).

There is much traditional knowledge of the subsistence uses of nonsalmon fish in the Bristol Bay Area. For example, a Yup'ik taxonomic classification system for freshwater fish species has 3 entries, and thus 3 taxons, for the fish that Western science classifies in only 1: Dolly Varden. The Yup'ik distinctions are made depending upon the condition of the flesh for aging, freezing, and/or drying; harvest locations; and harvest methods (Fall et al. 1996; Fall, Krieg, et al. 2009).

The Division of Subsistence has compiled a traditional ecological knowledge (TEK) database, "From *Neqa* to *Tepa*," about the fish of Bristol Bay based on interviews with area residents in 2003 as part of OSM project 01-109.[2] An expanded version of the database incorporating findings from 8 Kvichak watershed communities was renamed "From *Neqa* to *Tepa*, *Łuq'a* to *Chuqilin*" to reflect the addition of Dena'ina Athabascan TEK (BBNA and ADF&G 1996; Krieg et al. 2005).

In addition a recent report conducted in collaboration between the Division of Subsistence and BBNA outlines harvest patterns of whitefish and other freshwater nonsalmon fish by the communities around Lake Clark and Iliamna Lake for 2012 and 2013 (Hazell et al. 2015). The report presents the results of a study of whitefish and other freshwater nonsalmon fish harvest patterns and trends by communities around Lake Clark and Iliamna Lake, Alaska; the study focuses on climate change in context with harvesting patterns and trends. The study communities included Igiugig, Iliamna, Newhalen, Nondalton, Pedro Bay, and Port Alsworth. The project was implemented using social science methods—including harvest surveys, participant observation, and key respondent interviews—over a 2-year period. The results of this study indicate the continued significance of whitefish and other nonsalmon freshwater fish subsistence harvests to inhabitants of the study communities. Freshwater nonsalmon fish resources are particularly vital to residents in the spring and fall when salmon and other resources are not available in abundance. Additionally, local residents consistently reported a climate characterized by a warming trend in recent decades (i.e., at least 20–25 years), which has affected their ability to obtain nonsalmon fish resources.

2. Coiley-Kenner, P. 2003. From Neqa to Tepa: a database with traditional knowledge about the fish of Bristol Bay and the northern Alaska Peninsula. Version 2.0. Alaska Department of Fish and Game Division of Subsistence, Juneau.

Table 6-1.–Estimated subsistence salmon harvests by district and location fished, Bristol Bay Area, 2015.

Area and river system	Number of permits issued[a]	Estimated salmon harvest					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Naknek-Kvichak District	486	678	69,720	796	263	126	71,583
Naknek River Subdistrict	286	604	30,305	792	234	126	32,062
Kvichak River/Iliamna Lake Subdistrict:	199	70	39,279	0	28	0	39,377
Igiugig	1	1	43	0	3	0	47
Iliamna Lake-General	39	0	5,570	0	0	0	5,570
Kijik	4	0	550	0	0	0	550
Kokhanok	18	57	6,416	0	25	0	6,498
Kvichak River	19	0	2,220	0	0	0	2,220
Lake Clark	62	0	6,111	0	0	0	6,111
Levelock	6	10	398	0	0	0	408
Newhalen River	39	0	10,974	0	0	0	10,974
Pedro Bay	17	0	2,419	0	0	0	2,419
Pile Bay	1	2	320	0	0	0	322
Six Mile Lake	14	0	4,258	0	0	0	4,258
Naknek or Kvichak (Site Unknown)	3	4	136	3	0	0	144
Egegik District	32	150	1,253	353	38	13	1,806
Ugashik District	20	53	935	217	8	0	1,214
Nushagak District	591	12,117	25,240	5,644	2,953	295	46,248
Igushik/Snake River	31	102	2,753	331	28	19	3,233
Nushagak Bay Commercial	56	767	1,857	555	281	13	3,473
Nushagak Bay Noncommercial	178	2,863	6,685	1,872	826	190	12,436
Nushagak River	127	4,651	4,247	1,307	1,072	56	11,333
Site Unknown	34	689	737	173	170	7	1,776
Wood River	206	3,046	8,960	1,405	576	10	13,997
Togiak District	48	876	2,387	650	312	23	4,249
Total	**1,169**	**13,874**	**99,535**	**7,659**	**3,573**	**458**	**125,100**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Note Harvests are extrapolated for all permits issued, based on those returned and on the area fished as recorded on the permit. Due to rounding, the sum of columns and rows may not equal the estimated total. Of 1,169 permits issued for the management area, 1,072 were returned (92.0%).

a. Sum of sites may exceed district totals, and sum of districts may exceed area total, because permittees may use more than one site.

Table 6-2.–Estimated historical subsistence salmon harvests, Bristol Bay Area, 1983–2015.

	Permits		Estimated salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1983	829	674	13,268	143,639	7,477	11,646	1,073	177,104
1984	882	698	11,537	168,803	16,035	13,009	8,228	217,612
1985	1,015	808	9,737	142,755	8,122	5,776	825	167,215
1986	930	723	14,893	129,487	11,005	11,268	7,458	174,112
1987	996	866	14,424	135,782	8,854	8,161	673	167,894
1988	938	835	11,848	125,556	7,333	9,575	7,341	161,652
1989	955	831	9,678	125,243	12,069	7,283	801	155,074
1990	1,042	870	13,462	128,343	8,389	9,224	4,455	163,874
1991	1,194	1,045	15,245	137,837	14,024	6,574	572	174,251
1992	1,203	1,028	16,425	133,605	10,722	10,661	5,325	176,739
1993	1,206	1,005	20,527	134,050	8,915	6,539	1,051	171,082
1994	1,193	1,019	18,873	120,782	9,279	6,144	2,708	157,787
1995	1,119	990	15,921	107,717	7,423	4,566	691	136,319
1996	1,110	928	18,072	107,737	7,519	5,813	2,434	141,575
1997	1,166	1,051	19,074	118,250	6,196	2,962	674	147,156
1998	1,234	1,155	15,621	113,289	8,126	3,869	2,424	143,330
1999	1,219	1,157	13,009	122,281	6,143	3,653	420	145,506
2000	1,219	1,109	11,547	92,050	7,991	4,637	2,599	118,824
2001	1,226	1,137	14,412	92,041	8,406	4,158	839	119,856
2002	1,093	994	12,936	81,088	6,565	6,658	2,341	109,587
2003	1,182	1,058	21,231	95,690	7,816	5,868	1,062	131,667
2004	1,100	940	18,012	93,819	6,667	5,141	3,225	126,865
2005	1,076	979	15,212	98,511	7,889	6,102	1,098	128,812
2006	1,050	904	12,617	95,201	5,697	5,321	2,726	121,564
2007	1,063	917	15,444	99,549	4,880	3,991	815	124,679
2008	1,178	1,083	15,153	103,583	7,627	5,710	2,851	134,924
2009	1,063	950	14,020	98,951	7,982	5,052	442	126,447
2010	1,082	979	10,852	90,444	4,623	4,692	2,627	113,238
2011	1,122	1,039	14,106	101,017	7,493	3,794	333	126,744
2012	1,107	932	12,136	100,728	3,837	4,007	1,874	122,582
2013	1,162	986	12,858	98,765	8,635	5,173	333	125,764
2014	1,158	1,031	17,417	99,008	8,984	6,677	2,689	134,775
2015	1,169	1,072	13,874	99,535	7,659	3,573	458	125,100
5-year average (2010–2014)	1,126	993	13,474	97,993	6,714	4,869	1,571	124,621
10-year average (2005–2014)	1,106	980	13,982	98,576	6,765	5,052	1,579	125,953
Historical average (1983–2014)	1,097	960	14,674	113,613	8,210	6,366	2,281	145,144

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 6-3.–Estimated subsistence salmon harvests by community, Bristol Bay Area, 2015.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Aleknagik	23	21	626	1,445	60	55	0	2,186
Clarks Point	10	10	59	598	214	57	13	941
Dillingham	344	330	6,697	13,666	3,673	1,452	234	25,722
Egegik	7	4	5	189	81	23	9	306
Ekwok	21	20	749	379	327	164	0	1,618
Igiugig	8	4	22	1,228	0	4	0	1,254
Iliamna	38	35	8	9,618	0	0	0	9,626
King Salmon	86	80	148	7,397	97	78	20	7,741
Kipnuk	1	1	19	30	0	0	0	49
Kokhanok	20	17	4	8,482	0	0	0	8,486
Koliganek	10	10	627	768	308	382	0	2,085
Levelock	7	3	12	464	0	0	0	476
Manokotak	31	30	115	2,525	244	43	19	2,946
Naknek	94	87	269	11,905	357	69	29	12,628
New Stuyahok	43	36	2,914	1,639	603	676	27	5,860
Newhalen	2	2	0	573	0	0	0	573
Nondalton	22	14	0	8,762	0	0	0	8,762
Pedro Bay	14	14	2	2,519	0	0	0	2,521
Pilot Point	7	4	9	299	102	5	0	415
Port Alsworth	53	52	0	6,620	27	0	2	6,649
South Naknek	22	17	60	2,725	250	54	54	3,143
Togiak	48	43	874	2,365	650	310	23	4,223
Twin Hills	1	1	2	47	0	5	0	54
Ugashik	8	7	38	502	78	2	0	619
Subtotal, Bristol Bay	**920**	**842**	**13,259**	**84,746**	**7,068**	**3,381**	**431**	**108,885**
Anchor Point	1	1	0	70	0	0	0	70
Anchorage	115	105	212	6,323	357	55	17	6,965
Barrow	2	2	75	34	0	2	0	111
Bethel	4	2	30	20	16	0	0	66
Big Lake	6	6	3	490	0	2	1	496
Chugiak	9	9	6	240	23	1	0	270
Copper Center	1	1	0	0	0	0	0	0
Cordova	1	1	0	170	0	0	0	170
Eagle River	9	9	8	688	0	10	3	709
Fairbanks	20	19	18	827	66	7	0	918
Fritz Creek	1	1	0	120	0	0	0	120
Girdwood	4	4	24	77	10	0	0	111

-continued-

Table 6-3.–Page 2 of 2.

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Healy	1	1	0	0	35	0	0	35
Homer	11	11	29	1,013	10	14	1	1,067
Juneau	2	2	35	28	0	0	0	63
Kasilof	1	1	1	66	0	6	0	73
Kenai	6	6	14	269	5	0	0	288
Ketchikan	2	1	0	82	0	0	0	82
Kodiak (city)	8	7	24	606	0	14	0	643
Kotzebue	1	1	0	3	6	0	1	10
McGrath	2	1	4	52	0	4	0	60
Moose Pass	1	1	0	0	0	0	0	0
Nikiski	2	2	1	92	12	0	0	105
Ninilchik	1	1	10	44	0	9	0	63
Nome	1	1	0	0	0	0	0	0
North Pole	2	2	0	0	0	0	0	0
Palmer	10	7	16	1,269	0	9	0	1,293
Petersburg	1	1	0	35	0	0	0	35
Soldotna	3	3	11	92	22	7	0	132
Talkeetna	2	2	25	38	0	26	0	89
Wasilla	18	18	70	2,042	29	27	3	2,171
Willow	1	1	0	0	0	0	0	0
Subtotal, other Alaska	**249**	**230**	**615**	**14,789**	**591**	**193**	**26**	**16,215**
Total	**1,169**	**1,072**	**13,874**	**99,535**	**7,659**	**3,573**	**458**	**125,100**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 6-4.–Uses and harvests of fish other than salmon, Bristol Bay communities.

		Percentage of households[a]					Average pounds harvested	
Community	Year[a]	Use	Fish for	Harvest	Receive	Give	Per household	Per person
Aleknagik	2008	78	69	66	50	44	95	26
Clarks Point	2008	100	100	100	73	73	71	34
Dillingham	2010	69	42	42	53	29	23	7
Egegik	1984	64	60	60	24	40	37	16
Ekwok	1987	76	72	62	62	38	229	69
Igiugig	2013	94	78	61	83	61	14	5
Iliamna	2013	79	69	69	59	31	79	30
King Salmon	2007	57	55	49	16	12	15	5
Kokhanok	2005	74	66	66	51	57	137	36
Koliganek	2005	96	93	93	75	68	323	90
Levelock	2005	86	86	86	50	57	71	40
Manokotak	2008	93	80	80	84	56	173	44
Naknek	2007	76	68	65	48	32	47	18
New Stuyahok	2005	88	78	78	67	47	123	28
Newhalen	2013	88	70	67	73	33	38	12
Nondalton	2013	84	73	73	62	60	147	45
Pedro Bay	2013	73	64	46	55	36	41	17
Pilot Point	1987	94	94	94	35	59	56	16
Port Alsworth	2013	41	37	37	14	8	14	4
Port Heiden	1987	92	62	62	70	46	33	12
South Naknek	2007	86	52	52	67	43	16	8
Togiak	2008	94	85	84	81	73	264	62
Twin Hills	1999	92	92	92	75	92	303	101
Ugashik	1987	1	100	100	0	40	72	36

Sources CSIS; BBNA and ADF&G 1996; Coiley-Kenner (2003); Krieg et al. (2005); Fall et al. (2006); Krieg et al. (2009); Holen et al. (2011); Holen et al. (2012); Fall et al. (2013); Evans et al. (2013); and Hazell et al. (2015).

a. Most recent year for which data are available.

Table 6-5.–Nonsalmon finfish used for subsistence purposes in the Bristol Bay Area.

Common English name	Scientific name	Yup'ik name	Dena'ina name
Arctic grayling	*Thymallus arcticus*	*Nakrullugpak* *Culugpauk*	*Ch'dat'an*
Alaska blackfish	*Dallia pectoralis*	*Can'giiq*	*Huzhegh*
Burbot	*Lota lota*	*Manignaq*[a] *Atgiaq*[b]	*Ch'unya*
Dolly Varden[c]	*Salvelinus malma*	*Yugyaq*[d] *Anerrluaq* *Anyuk*	*Qak'elay*
Lake trout	*Salvelinus namaycush*	*Cikignaq*	*Zhuk'udghuzha*
Longnose sucker	*Catostomus catostomus*	*Cungartak*	*Duch'ehdi*
Northern pike	*Esox lucius*	*Cuukvak*	*Ghelguts'i*
Rainbow smelt	*Osmerus mordax*	*Iqalluaq*	
Rainbow/steelhead trout	*Oncorhynchus mykiss*	*Talaariq*	*Tuni*
Broad whitefish[e]	*Coregonus nasus*	*Akakiik*	*Telay*
Humpback whitefish[e]	*Coregonus pidschian*	*Uraruq*	*Q'untuq'*
Round whitefish[e]	*Prosopium cylindraceum*	*Uraruq*	*Hesten*
Least cisco	*Coregonus sardinella*	*Cavirrutnaq*	*Ghelguts'i k'una*
Pacific herring	*Clupea pallasi*	*Iqalluarpak*	
Pacific herring spawn on kelp		*Melucuaq*	
Starry flounder	*Platichthys stellatus*	*Naternaq*	
Pacific halibut	*Hippoglossus stenolepis*	*Naternarpak*	
Pacific cod	*Gadus macrocephalus*	*Ceturrnaq*	
Sculpin	Various species	*Kayutaq*	
Capelin	*Mallotus villosus*	*Cikaaq*	
Yellowfin sole	*Limanda aspera*	*Sagiq*	

Source Fall et al. (1996).

a. Nushagak River villages.

b. Manokotak, Aleknagik, Twin Hills, Togiak.

c. Also includes the closely related Arctic char.

d. At Togiak, Manokotak, and Aleknagik, and perhaps elsewhere, there are three Yup'ik names for Arctic char/Dolly Varden. Yugyak probably refers to resident char/Dolly Varden. *Anerrluak*, called "Togiak trout" in the local English dialect, probably refers to anadromous fish taken in fresh water. Finally, *anyuk* or "sea run dollies" are Dolly Varden or Arctic char taken in salt water. See Fall et al. (1996:16–20) for further discussion of these distinctions.

e. Broad whitefish are rare to absent in the Bristol Bay region. *Akakiik* is the word used at Aleknagik and Manokotak to refer to whitefish they receive from Kuskokwim River communities, where broad whitefish are common. Humpback whitefish are caught in the Iliamna Lake subregion and called *uraruq*. *Uraruq* is also used for round whitefish in the Togiak and Nushagak drainages.

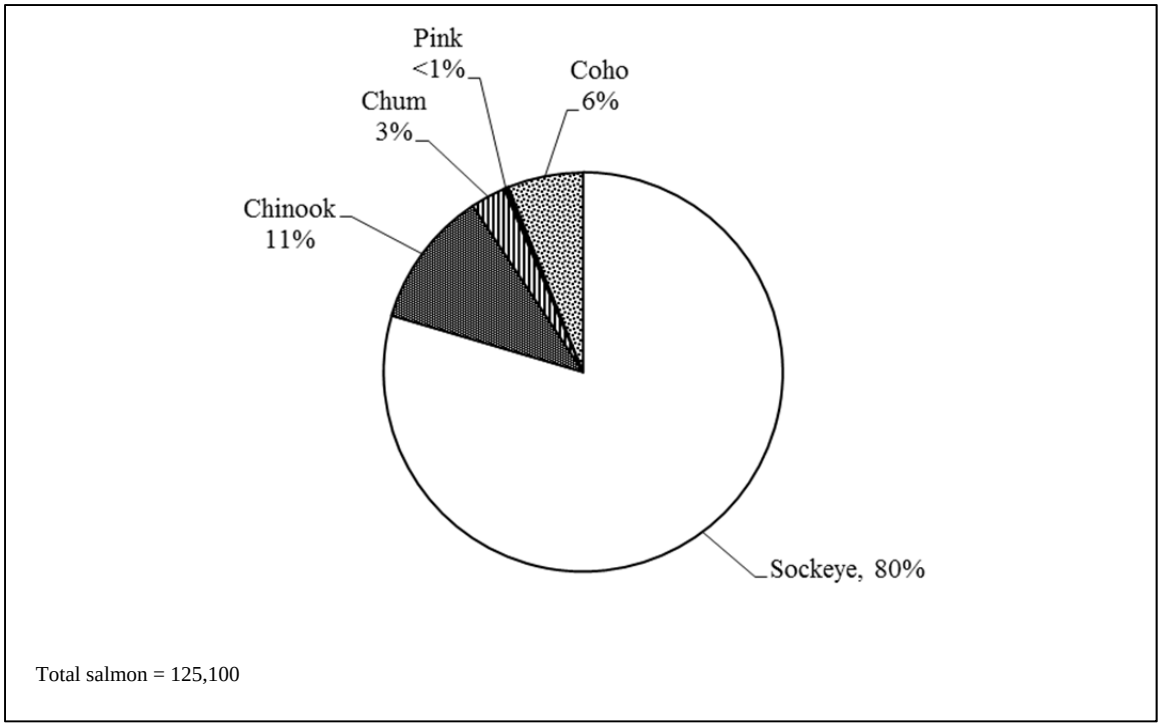

Figure 6-1.–Bristol Bay Area subsistence salmon harvest composition by species, 2015.

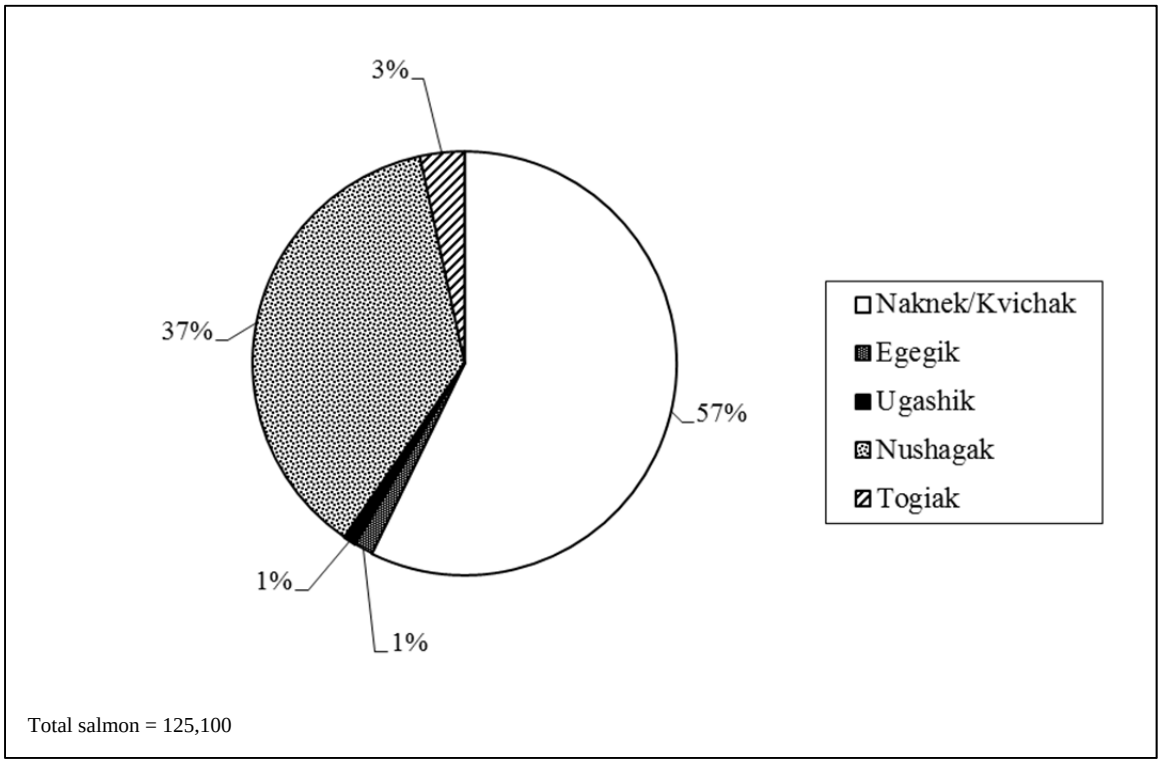

Figure 6-2.–Bristol Bay Area subsistence salmon harvests by district, 2015.

CHAPTER 7: CHIGNIK MANAGEMENT AREA

BACKGROUND

The Chignik Management Area (CMA) encompasses all coastal waters and inland drainages on the south side of the Alaska Peninsula from Kilokak Rocks at the southern entrance to Imuya Bay at 57 degrees 10.34'N. lat., 156 degrees 20.22' W. long., then due south to Kupreanof Point at 55 degrees 33.98' N. lat. 159 degrees 35.88' W. long. (5 AAC 15.100).[1] There are 5 communities in Alaska Department of Fish and Game's (ADF&G) salmon Chignik Management Area (CMA): Chignik with a 2015 estimated population of 95, Chignik Lagoon (population 78), Chignik Lake (population 64), Perryville (population 111), and Ivanof Bay (population 7) (Figure 7-1).[2] All of these communities are within the Lake and Peninsula Borough, and virtually all area residents participate in harvesting salmon in the CMA. Published Division of Subsistence reports for the CMA include annual salmon permit harvest reports, sporadic household surveys, and subsistence salmon ethnography studies (Hutchinson-Scarbrough et al. 2010, 2016; Hutchinson-Scarbrough and Fall 1996; Morris 1987).

The Division of Subsistence household harvest surveys show that salmon compose approximately 45% of all resources harvested, by weight, for subsistence in these communities (Fall et al. 1995). Chignik subsistence salmon permits are issued annually by CMA vendors, with harvest reports due to the department by December 31. The 2015 estimated total subsistence salmon harvest was 12,121 salmon; 81% sockeye salmon, 11% coho salmon, 4% pink salmon, 2% chum salmon, and 1% Chinook salmon (Table 7-1; Figure 7-2).

In 1993, the BOF made a positive determination that salmon in the CMA are customarily and traditionally taken or used for subsistence (a "positive C&T finding") and specified amounts of salmon are reasonably necessary for subsistence (ANS) in each CMA district. In 2002, the BOF modified the original finding for ANS (5 AAC 01.466 (a) and (b)) (ADF&G 1994). The current amounts necessary for subsistence for Chignik Bay, Central, and Eastern districts combined are 5,200–9,600 early-run sockeye salmon; 2,000–3,800 late-run sockeye salmon; 100–150 Chinook salmon; and 400–700 salmon other than sockeye or Chinook salmon. In the Perryville and Western districts combined, the ANS findings are 1,400–2,600 coho and 1,400–2,600 salmon other than coho salmon. The BOF has also set an ANS for rainbow/steelhead trout *O. mykiss* at 200–300 fish and for finfish other than salmon and rainbow trout at 15,200–22,800 pounds of usable weight.

REGULATIONS

Current (2014–2015) State of Alaska regulations governing subsistence salmon fishing in the Chignik Management Area require that to fish, an individual must obtain an annual subsistence salmon permit, and must be an Alaska resident (5 AAC 01.480). Annually, permits are available locally at the Chignik ADF&G weir facility and from local CMA community vendors. The permit holder must record daily salmon harvests directly on the permit and return it to the Alaska Department of Fish and Game by December 31. Catch information obtained from subsistence permits is compiled annually and used to assess regional subsistence salmon fisheries. There is an annual limit of 250 salmon per permit, but an additional permit may be obtained if more fish are needed (5 AAC 01.480(b)(c)). Salmon may be taken by seines and gillnets, except that in Chignik Lake salmon may not be taken with purse seines. A gillnet may not be set, staked, anchored or otherwise fixed in a stream while it obstructs more than one-half of the width of the waterway or any channel of the waterway (5AAC 01.470).

1. Alaska Department of Fish and Game. 2011–2014 Chignik and Kodiak Areas, commercial salmon fishing regulations, 89. Alaska Department of Fish and Game, Juneau. http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/ChigKod-2011-14.pdf
2. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed October 17, 2017. http://live.laborstats.alaska.gov/pop/index.cfm

Under state regulations, all waters within the CMA are open year-around for subsistence fishing except for the following areas or conditions:

- Only Alaska residents are eligible to obtain a CMA subsistence salmon permit and may fish in the areas open to subsistence at any time. An Alaska resident Chignik Area commercial salmon fishing license holder (includes CFEC Permit and crewmember license holder) may subsistence fish during a commercial salmon fishing period, except for 12 hours before a commercial salmon fishing period and 12 hours after a commercial salmon fishing period (5 AAC 01.485).
- Legal gear includes seines and gillnets. Purse seines may not be used in Chignik Lake (5 AAC 01.470(a)). Additionally, any gillnet that is fixed, anchored, or otherwise held in place may not obstruct more than one half of the width of any stream open to subsistence fishing. All subsistence salmon fishing gear must be marked with a buoy listing the first initial and last name as well as the address of the person operating the gear (5 AAC 01.010(h)). Subsistence users must carry their subsistence fishing permit with them while fishing.
- Subsistence salmon fishing is permitted in the Chignik River; however, salmon may not be taken from a point 300 feet upstream from the ADF&G weir to the outlet of Chignik Lake from July 1–August 31 (5 AAC 01.475(1)), which is closed to protect the spawning Chinook salmon. The Chignik River, beginning 300 feet below the weir, is open to subsistence salmon fishing year round.
- Subsistence fishing is closed within 300 feet above or below the Chignik weir when it is operational (5 AAC 01.470).
- Subsistence fishing is closed year-round in Black Lake or any tributary to Black Lake or Chignik Lake, except the waters of Clark River and Home Creek from each of their confluences with Chignik Lake to a point 1 mile upstream (5 AAC 01.475(2)).

RECENT REGULATORY HISTORY

Subsistence harvest patterns in the CMA are often influenced by Chignik commercial salmon fisheries since many of those who commercial fish are also subsistence harvesters. Regulations for subsistence salmon fishing are tied to Chignik commercial fishing operations. Prior to 2002, the CMA commercial fishery was managed by ADF&G as a competitive limited entry permit fishery. Pre-2002 regulations allowed subsistence fishing with seine and gillnet gear and required an individual permit with a seasonal limit of 250 salmon. Purse seines could be used to harvest subsistence salmon, except in Chignik Lake, which has been open by regulation to subsistence salmon fishing with gillnets or hand seines since 1985 (Morris 1987:185). Also prior to 2002, CMA commercial salmon harvesters could not subsistence fish between June 10 and September 30, although they could remove salmon caught during commercial openings for home use. Subsistence salmon fishing was not allowed in Chignik River upstream of the ADF&G weir site to Chignik Lake, in tributaries to Chignik Lake, or in Black Lake.

From 2002 to 2006, the CMA commercial salmon fishery was managed based on 2 management plans: the Chignik Area Management Plan (“competitive fishery”) and the Chignik Area Cooperative Purse Seine Salmon Management Plan ("cooperative fishery"; Stichert 2007a). After development of the cooperative fishery, ADF&G management staff initiated subsistence permit conditions in 2003 that increased subsistence harvest opportunities for commercial fishing license holders.[3] By regulation, commercial fishing permit holders could not subsistence fish for salmon from 48 hours before the first commercial salmon fishing opening through September 30. Subsistence fishing permit conditions allowed

3. Regulations providing for a cooperative commercial salmon fishery in CMA were invalidated by a decision of the Alaska Supreme Court and have not been operative since 2005.

commercial permit holders who were not engaged in commercial fishing during an opening for cooperative or competitive fleets to subsistence fish during commercial openings, after registering with ADF&G.

In 2004, through emergency order, ADF&G allowed subsistence salmon fishing within the Chignik River, excluding the waters 100 yards upstream and downstream of the Chignik weir, through June 30. Regulations had closed the Chignik River to subsistence salmon fishing (5 AAC 01.475) until 2006. In addition to obtaining a subsistence permit, commercial harvesters wishing to subsistence fish after the first commercial opening could do so, with a requirement to register with ADF&G staff working at the weir. ADF&G established a subsistence fishing schedule for these commercial harvesters depending upon whether they fished for the cooperative fleet or independently (Bouwens 2004).

At its 2004 meeting, the BOF adopted regulations to increase subsistence fishing opportunities for commercial salmon fishing license holders by allowing them, with certain restrictions (5 AAC 01.485), to harvest subsistence salmon during the commercial salmon fishing season. In addition, the BOF directed ADF&G to manage for an increase in escapement of sockeye salmon during the August commercial fishery (from 50,000 to 75,000), to enhance late-season subsistence opportunities in Chignik Lake. Although the commercial fishery was limited in August, the sockeye escapement goal was not achieved in 2005 (Bouwens 2005). In 2005, the BOF opened the Chignik River drainage to subsistence fishing, except for waters within 300 feet of the weir, and except for a July 1 through August 31 closure upstream of the weir to protect spawning Chinook salmon (Stichert 2007b).

The cooperative fishery plan was repealed by the Alaska Supreme Court in March 2005, but the BOF reestablished the cooperative management plan by emergency regulation because there was not enough time between the ruling and the 2005 fishing season for co-op members to revert to fishing as independent fishers. Since 2006, however, the CMA commercial fishery has been managed solely under the *Chignik Salmon Management Plan* as a competitive fishery (Stichert 2007b).

During its January 2008 meeting, the BOF adopted regulatory changes to subsistence fishing in the CMA that allowed subsistence salmon fishing in Clark River and Home Creek from their confluences with Chignik Lake upstream 1 mile. The use of gillnets for subsistence fishing in the CMA remained legal, but when they are fixed, anchored or otherwise held in place, they may not obstruct more than one-half of the stream that is open to subsistence salmon fishing (Jackson 2009).

The Village Council of Chignik Lake submitted a regulatory proposal at the CMA BOF meeting in January 2011. The proposal, if adopted, would have legalized subsistence fishing in the only areas in the CMA closed under state regulations—Chignik Lake, Black Lake, and all tributaries to both lakes—as well as legalized the use of hook and line gear for late-run spawned-out sockeye salmon in Clark River and Home Creek (Alaska Board of Fisheries 2011a). The BOF took no action on the proposal; however the Federal Subsistence Board (FSB) adopted a similar regulation for the CMA at its January 2011 meeting (Alaska Board of Fisheries 2011b; 76 FR 45:12566, 12578–12579 [March 8, 2011]; 36 CFR 242.27 (e) (8)).

At the FSB regulatory meeting January 24, 2013, the FSB adopted a proposal submitted by the Chignik Lake Traditional Council to allow the harvest of salmon in the Chignik River, with rod and reel, from a point 300 feet upstream of the AF&G weir to Chignik Lake from January 1 through August 9, with no daily harvest or possession limit under the authority of a federal subsistence fishing permit. In addition, the FSB adopted a regulation allowing the taking of salmon by gillnet in Black Lake or any tributary to Black or Chignik lakes. The BOF closed this portion of the river in 2004 to protect spawning Chinook salmon, and it remains closed for subsistence fishing July 1–August 31, but open to sport fishing, under state regulation.[4,5]

4. Federal Subsistence Board. Public Regulatory Meeting Proceedings, Volume III. January 24, 2013, Anchorage. Accessed July 2014. http://www.doi.gov/subsistence/library/transcripts/upload/FSB-Mtg-24-Jan-13-2.pdf

The Alaska Board of Fisheries at their December 2013 meeting adopted a board-generated proposal to codify a management measure first established through board intent language adopted in 2004. The management measure is intended to ensure inriver harvest opportunities above the Chignik River weir to satisfy late-run subsistence harvests. To do so, the department shall manage for 50,000 sockeye salmon, in addition to late run escapement needs, which shall be comprised of 25,000 fish in August and 25,000 fish from September 1–15 (5 AAC 15.357(b)(3)).[6]

The Chignik River watershed has 2 genetically different sockeye runs annually that overlap during late June and early July, and escapement objectives are based on daily escapement objectives by run. Before 2014, ADF&G estimated the total escapement for early run sockeye salmon based on Chignik River weir counts through July 4 using scale pattern analysis studies. After July 4, sockeye salmon through the weir was considered late-run escapement. In 2014, the department used inseason genetic samples collected at the weir that were analyzed within 36–48 hours after collection to determine when the 2 runs during late June and mid-July overlapped, as well as to illustrate, alongside prior years' data, the variability in timing for either run. This data was used to establish new interim escapement objectives for both runs, and the escapement goal for the second run was changed to start on June 20 rather than the previously used date of July 5 (Wilburn and Stumpf 2016).

HARVEST ASSESSMENT PROGRAM

Estimates of annual CMA subsistence salmon harvests are based on annual permit returns combined with periodic post permit household surveys in the CMA communities. The Division of Commercial Fisheries conducted its first subsistence salmon harvest assessment in the CMA in 1976. Subsistence harvest assessments for salmon have been conducted annually since then. Beginning in 1980, any fishers who chose to harvest their subsistence salmon from the Chignik Management Area had to obtain a permit. The Division of Subsistence assumed responsibility of the harvest assessment program from 1993–2011. In 1993, the Division of Subsistence obtained copies of all available subsistence permits for the CMA from the Division of Commercial Fisheries' archive in Kodiak. Permits issued prior to 1980 and for 1987 could not be located. Since 1993, harvest data from returned permits have been expanded by community of residence to estimate the harvest by all permit holders. Data from returned permits are tabulated by species and fishing area. Starting in 2012, the Division of Commercial Fisheries resumed the responsibility due to funding losses for the Division of Subsistence's harvest assessment program.

All permit data were entered into a database. The estimated harvests developed in this database and reported in subsequent Division of Commercial Fisheries reports differ slightly from those reported in earlier reports for several reasons. There are small discrepancies in some years in the number of permits issued or returned. Estimated harvests in earlier reports were based on a simple expansion from harvests reported on returned permits to the total number of permits issued.

The method of permit issuance in the communities varies by community and year, depending on the availability of vendors and other arrangements in place with area organizations. Permits are also issued upon request at the Chignik River fish weir by Division of Commercial Fisheries' seasonal staff, as well as from local community vendors. Chignik subsistence salmon permits must be returned by mail to the Alaska Department of Fish and Game by December 31 of the year issued. Permits include a harvest report that fishers are required to complete. The report asks for the dates fished, the specific locations fished, and the number of each species of salmon caught on each day. Nonresponses are sent reminder letters, and those that return their permit are automatically issued a new permit the following year. In addition, from 1993–2008, 2011, 2014, and 2015 the Division of Subsistence staff and survey technicians trained and

5. Federal Subsistence Board. Subsistence Management Regulations for the Harvest of Fish and Shellfish on Federal Public Lands and Waters in Alaska, 2013–2015, 47–48. Federal Subsistence Board, Office of Subsistence Management, Anchorage.
6. Alaska Board of Fisheries. 2013. Chignik Finfish, Meeting, December 5–6, 2013, RC015, Anchorage. Accessed September 2014. http://www.adfg.alaska.gov/static-f/regulations/regprocess/fisheriesboard/pdfs/2013-2014/chignik/rcs/rc015_Chignik_Area_Salmon_Management_Plan.pdf

hired by the Division of Subsistence from each community administered face-to-face household subsistence salmon harvest surveys in each of CMA communities to collect harvest information from households that subsistence fished but did not obtain a permit, or did obtain a permit, but had not returned their permit to the department at the end of the year. Surveys were generally conducted during January, February, and March. Respondents were asked questions like those included on the permit as well as additional questions regarding late season harvests and whether their subsistence needs were met.

Increases in permits issued and returned beginning in 1993, and consequently higher harvest estimates, reflect the use of area vendors to issue permits as well as postseason surveys conducted by ADF&G staff and area research assistants. Comparisons of household survey data and permit data collected for 1984, and 1989 suggested that permit data underestimated subsistence harvests in the Chignik Area subsistence salmon fishery (Hutchinson-Scarbrough et al. 2016; Hutchinson-Scarbrough and Fall 1996:27). With the assistance of area permit vendors, ADF&G Chignik weir staff, research assistants, and area governments, subsistence salmon harvest assessments for most recent years, with some exceptions, have resulted in more reliable estimates of the total harvest.

While subsistence salmon permits are issued to an individual, other members of a household can acquire additional permits if more fish are needed. Therefore, the number of permits per household, and per community, can vary each year and may not necessarily represent a change in population or household size.

CMA Subsistence Salmon Harvests

In 2015, the number of subsistence permits issued for the Chignik Area totaled 123 permits, and 119 (97%) were returned with harvest information to ADF&G or collected during post season household surveys (Table 7-1). Of these 89 (72% of the total permits issued for the area) were issued to residents of the Chignik area communities of Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville, who returned 85 (96%) of the permits issued, and 34 (28% of the total permits issued for the area) were issued to and 34 (100%) returned by residents of other Alaska communities (Table 7-2). In 2014, 8% fewer (113) permits were issued and 101 were returned, a return rate of 89%. Since 1977, the number of subsistence salmon permits issued for the Chignik Area has averaged 104 per year, with 73 permits (70%) returned. Over the last 10 years (2005–2014), the average has been 109 permits issued and 86 permits (79%) returned, and the recent 5-year average (2010–2014) was 110 permits issued and 90 (82%) returned (Table 7-1).

Harvest reports printed on the back of subsistence salmon permits direct fishers to record each species of salmon they harvest. In 2015, the total estimated CMA salmon harvest was 12,121 fish, which was 22% higher than the 2014 estimate of 9,950 salmon harvested, but closer to the historical (1977–2014) average of 11,146 salmon (9% higher), as well as the 10-year (2005–2014) average of 10,523 salmon (15% higher) as well as the 5-year (2010–2014) average of 10,278 (18% higher) salmon harvested in the Chignik area (Table 7-1).

In 2015, the Chignik Area subsistence salmon harvest was composed of 81% sockeye salmon (9,854 fish), 11% coho salmon (1,393 fish), 4% pink salmon (481 fish), 2% chum salmon (233 fish), and 1% Chinook salmon (160 fish) (Figure 7-2; Table 7-1). Sockeye harvests in 2015 were 25% higher than the previous year of 7,855 fish and 14–27% higher than 5-year (2010–2014) 10-year (2005–2014) and historical (1977–2014) averages, but well within the historical (1977–2014) range of 2,049–14,710 total sockeye salmon estimated harvested (Table 7-1). Chum and coho harvests in 2015 compared to the year prior had not changed significantly and were similar to the numbers of chum and coho harvested in 2014 as well as past 5-year, 10-year, and historical averages of fish harvested. Pink and Chinook harvests showed the most variability in 2015 compared to previous years. An estimated 481 pink salmon were harvested in 2015, which was 42% higher than the year prior, but 36% lower than the (2010–2014) average of 756, 38% less than the 10-year average, and 44% less than the historical (1977–2014) average. Chinook harvests in 2015 totaled 160 fish, which was the highest reported since 2010 (188 fish).

Compared to the year prior, 2015 Chinook harvests were just 8% higher (148 fish), 24% higher than the 10-year (2005–2014) average (129 fish), and 88% higher than the historical (1977–2014) average of 85 fish estimated harvested, but well within the historical range from 0 to 259 estimated Chinook salmon harvested (Table 7-1).

CMA Subsistence Salmon Harvests by Community

Many individuals who do their subsistence salmon fishing in the Chignik area are residents of Chignik Lake, Chignik Lagoon, Chignik Bay, Perryville, and Ivanof Bay. CMA residents have consistently held most of the CMA subsistence salmon permits and are responsible for the most of the reported salmon harvest each year. In 2015, 72% of permits (89) were issued to Chignik area residents, and they were responsible for 87% of the harvest (10,567 fish) while residents of other parts of Alaska held 34 permits (28% of all permits issued) and harvested 13% (1,554 fish) of the 12,121 total salmon harvest (Table 7-2; Figure 7-6).

In 2015, Perryville residents acquired more permits (35 or 28%) and harvested more salmon (3,798 or 31%) than any other Chignik area community or the combined permits issued to non-Chignik area residents (34 permits or 28%). Chignik Lagoon and Chignik Lake residents each acquired 20 permits, tying for the second highest number of permits issued per community, but Chignik Lagoon residents harvested the second highest amount of total fish with 3,030 (25%), and Chignik Lake closely followed with a total 2,381 fish (20%). Chignik Bay had 14 permits issued with 1,358 fish estimated harvested, the lowest number of permits issued and fish harvested by Chignik area communities in 2015 (Table 7-2; Figure 7-6).

Community Salmon Harvests by Species

Sockeye were the most harvested species of salmon in the CMA in 2015 as well as historically, totaling 9,854 salmon, a 25% increase from 2014 sockeye harvests of 7,855 fish (Table 7-1). In 2015, the total sockeye salmon harvest in the CMA was apportioned as follows: Chignik Lagoon 2,813 (29%), Chignik Lake 2,250 (23%), Perryville 2,050 (21%), Chignik Bay 1,258 (13%), and other Alaska communities 1,483 (15%) (Table 7-2; Figure 7-7).

Coho were the second most harvested species of salmon in the CMA in 2015, totaling 1,393 fish, nearly the same as the previous year's harvest of 1,401 (Table 7-1). As in all previous years, Perryville harvested the majority of coho salmon with a total of 1,046 harvested, which represented 75% of the total CMA coho harvests in 2015. Perryville residents also harvested the highest numbers of pink and chum salmon in 2015, responsible for 94% (454) of pink salmon and 91% (213) of chum salmon harvests in 2014 (Table 7-2; Figure 7-7). Chignik Lagoon residents harvested the second highest quantity of coho salmon with 11% (153 fish) of total coho salmon harvested. Of a total of 160 estimated Chinook salmon harvested in the Chignik area, the most, 39% (63 fish), were taken by Chignik Bay residents, followed by Chignik Lagoon residents with 34% (54 fish), and Perryville residents harvested the third most Chinook salmon at 22% (35 fish). Perryville is far from the other 3 communities and the Chignik River sockeye salmon runs, but coho, pink, and chum salmon runs are accessible in local rivers and Perryville residents are able to harvest transient Chinook and sockeye salmon off the local beach. Many sockeye salmon harvested by Perryville residents are obtained from residents who commercial fish.

Location of Harvest

Subsistence salmon permits require people to record their harvest by species, date, quantity, and location. Table 7-3 shows the 2015 estimated subsistence salmon harvests by species and by general locations within the CMA identified by the Division of Subsistence as: Chignik Bay and Lagoon Subarea, Chignik Lake Subarea, and Perryville Subarea. The following section describes estimated salmon harvests, by location and species for 2015. The majority of total salmon harvested (47% or 5,679 fish) as well as the largest percentage of sockeye salmon (56% or 5,480 fish) and Chinook salmon (56% or 89 fish) occurred

in the Chignik Bay and Lagoon subarea. This area includes the Central, Eastern, and Chignik Bay commercial management districts (CMD), excluding areas above Mensis Point at the mouth of Chignik River at high tide in Chignik Lagoon. Compared to the previous year, salmon harvested from this subarea in 2014 was 72% higher than the estimated harvest of 3,293 total salmon taken, and 88% higher than harvest of 2,921 sockeye salmon estimated taken from this subarea in 2014. (Table 7-3) (Fall et al. 2017).

The remainder of total salmon harvested in 2015 were taken in near equivalent numbers from the Chignik Lake and Perryville subareas. The Chignik Lake subarea includes all waters of the Chignik River drainage above Mensis Point in Chignik Lagoon, including the Chignik River, Chignik Lake, and Chignik Lake tributaries. The estimated subsistence harvests in the Chignik Lake Subarea totaled 3,293 salmon, which represented 27% of estimated harvests of all salmon by location. The second largest percentage of sockeye salmon harvested in the Chignik area were harvested from the Chignik Lake subarea, with an estimated 2,997 sockeye harvested (30%) of all CMA sockeye harvests. Total salmon harvested from the Chignik Lake subarea in 2015 was 15% less (578 fish) than in 2014. Sockeye harvested from this subarea was 20% less (749 fish) than the previous year (Table 7-3) (Fall et al. 2017).

The Perryville Subarea corresponds to the Perryville and Western CMA commercial fishing districts. The reported salmon harvests in the Perryville subarea totaled 3,150 salmon, which represented 26% of all salmon harvested in CMA. The Perryville subarea ranked highest of all CMA subareas for coho, pink, chum and Chinook salmon harvests. Coho salmon harvested in this subarea totaled 1,071 coho salmon, which represented 77% of all CMA coho salmon harvested. Compared to the previous year, coho harvests in 2015 had declined slightly from the estimated 1,135 harvested in 2014. An estimated 454 pink salmon were harvested in the Perryville subarea representing 94% of total CMA pink salmon harvests (481 fish); 213 chum salmon were estimated harvested in this area which represented 91% of the total CMA harvests for chum salmon (233 fish) in 2015, and 35 Chinook salmon were estimated harvested in this area, which represented 22% of all Chinook salmon harvested in the CMA area. Compared to the previous year, Chinook salmon harvests in the Perryville Subarea in 2015 declined considerably by 64%, but pink and chum salmon harvests increased by 111% and 40% respectively (Table 7-3) (Fall et al. 2017).

Table 7-4 shows the estimated subsistence salmon harvests by species, fishing location, and date in 2015. Harvest dates shown in this table are divided into two periods of time, before June 20th and on or after June 20th the date that the Department used to define when the first late-run escapement goals were defined based on inseason genetic samples collected (Wilburn et al. 2015). The table represents the date of subsistence harvest by location and species but does not represent sockeye harvests separated by genetic sockeye stock.

In the Chignik area in 2015, 31% (3,764 fish) of the total subsistence harvest of 12,121 fish occurred before June 20 and 69% (8,357 fish) were harvested on or after June 20, most (74%) of which were sockeye (6,157 fish). Of all sockeye salmon harvested (9,854), most were taken from the Chignik Lagoon subarea in which 27% (2,684) sockeye were harvested before June 20, and 21% (2,087 fish) were harvested on or after June 20. Sockeye taken on or after June 20 from both Clark River and Chignik Lake combined totaled 1,597 fish (26%) sockeye harvested during this period. Of the total 1,393 coho harvests, 100% occurred on or after June 20 with 72% (997 fish) of the total coho harvest occurring in the Perryville area. (Table 7-4).

GEAR TYPE

Purse seines, hand seines, and gillnets are all allowable gear types for the harvesting of salmon for subsistence in the Chignik Management Area under state regulations. CMA subsistence salmon permits do not require that fishers record their gear type. Rod and reel or hook and line are sometimes used to harvest subsistence salmon under federal subsistence regulations (Hutchinson-Scarbrough et al. 2010; Hutchinson-Scarbrough and Fall 1996).

FEDERAL SUBSISTENCE FISHERY IN CMA

Federal subsistence fisheries are authorized in portions of the CMA for the permanent residents of the CMA communities. Federal regulations in the CMA apply to waters within or adjacent to the Alaska Peninsula National Wildlife Refuge, Aniakchak National Monument and Preserve, and the Alaska Maritime National Wildlife Refuge. Federal and state subsistence regulations in the CMA generally parallel each other; however, federal regulations authorize additional gear, harvest locations, and harvest seasons in portions of the CMA not authorized by the state. Starting in 2013, the federal program established a limited harvest assessment program where a federal permit would be required for residents of the CMA communities to harvest salmon in specific locations and/or with specific methods or seasons that are allowed by federal regulations but not state regulations in the federal lands and waters of the CMA. For example, a federal subsistence permit, that can only be issued to residents of the CMA communities, is required, in addition to a state subsistence fishing permit, to take salmon upstream of the Chignik River weir from January 1–August 9 using a rod and reel, with no daily harvest or possession limit, and to take salmon by gillnet in Black Lake or any tributary to Black or Chignik lakes. In 2015, there were 2 Federal permits issued to residents of the Chignik Area, with a total reported harvest of 6 sockeye and 14 Chinook salmon (Table 7-5).[7] Additional information about the federal subsistence fishery is available by contacting the United States Fish and Wildlife Service, Office of Subsistence Management in Anchorage, AK.

SALMON REMOVAL FROM COMMERCIAL HARVESTS FOR HOME USE ("HOME PACK")

Commercial fishers may also retain finfish from lawfully taken commercial catches for their home use, including use for bait under 5 AAC 39.010 (called "home pack" by area residents). These fish, if taken, are required to be reported on the commercial fish ticket and not on the subsistence salmon permit. Reported harvests are included in the ADF&G Division of Commercial Fisheries CMA annual finfish management reports. In 2015, Chignik commercial fishing boats reported on their commercial fish tickets, removing 28 sockeye salmon, 84 Chinook salmon, and 5 coho salmon from their commercial harvest for home pack (Wilburn and Stumpf 2016) (Wilburn et al. 2015).). Houshold surveys combined with fish ticket reports indicated that a total of 887 sockeye, 236 Chinook, 48 coho, 10 chum, and 1 pinks were removed from commercial fisheries for home pack in 2015 (Table 7-6).

OTHER CHIGNIK AREA SUBSISTENCE FISHERIES

Estimates of subsistence halibut harvests for eligible communities and tribes, including those of the CMA, are available for 2014 (Fall and Lemons 2016). Lack of funding prevented estimating subsistence halibut harvests for 2015.

Although state regulations require a subsistence permit for the harvest of rainbow/steelhead trout and Arctic char/Dolly Varden, there are no annual harvest assessment programs for the other subsistence fisheries of the Chignik Area. The BOF, in an update of its C&T finding in January 2002, identified positive subsistence uses of all finfishes in the Chignik Area. Table 7-7 lists the finfishes other than salmon for which subsistence uses have been documented through systematic household interviews conducted by the Division of Subsistence. Table 7-8 updates this information from a 2003 study.

For purposes of subsistence shellfish management, the Chignik Finfish Management Area is within the ADF&G Alaska Peninsula–Aleutian Islands Area. The BOF identified positive subsistence uses of all shellfish stocks in the Alaska Peninsula–Aleutian Islands Area. There are no subsistence harvest assessment programs for these shellfish stocks in the Chignik Area. Table 7-9 lists the shellfish for which

7. Personal communication with Derek Hildreth, Program Analysis with Regulations Division, Office of Subsistence Management, U.S. Fish and Wildlife Service, October 24, 2017.

subsistence uses have been documented through systematic household interviews. Table 7-10 updates this information from a 2003 study.

In early 2004, the Division of Subsistence and the Bristol Bay Native Association, in a project funded by the *Exxon Valdez* Oil Spill Trustee Council, conducted comprehensive household surveys in Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville that, among other things, collected updated harvest data for nonsalmon fishes and marine invertebrates. A fifth community, Ivanof Bay, was not included in the study because it had no permanent year-round population at the time. A summary of these findings appears in Fall (2006).

The reader should consult Morris (1987), Fall et al. (1995), Hutchinson-Scarbrough and Fall (1996), and ADF&G (2002) for more background on these subsistence fisheries for nonsalmon finfishes and for shellfish. For harvest estimates based on systematic household interviews, see the CSIS. Limited nonsalmon subsistence resource use and harvest information was observed and documented during the Division of Subsistence 2010–2013 Chignik Management Area Subsistence Salmon Ethnography study (Hutchinson-Scarbrough et al. 2016).

DISCUSSION

Prior to 2002, the years before the Chignik cooperative commercial fishery, many families processed most of their spring salmon for subsistence uses just prior to the first commercial opening in early June. Salmon were caught in early June either by purse seine or beach seine. Many families from Chignik Lake and Perryville would occupy fish camps across Chignik Lagoon. Chignik Lagoon and Chignik Bay families would, for the most part, put up their early subsistence fish as a family effort prior to the start of the first commercial fishing opening. These early-run fish (sockeye salmon) are especially important to subsistence users because these fish are traditionally smoked, and it is necessary to cure these fish before flies hatch and deposit eggs on the fish, which typically occurs in mid- to late June. Traditionally, subsistence users could maximize their early season subsistence harvests because of large pulses of early-arriving fish. Area subsistence fishers have also reported that the early-run fish taste better and freeze or salt better if harvested early in the season. The second run (late run) of sockeye salmon was traditionally taken either in Chignik Lagoon, Chignik Lake, or near the mouth of the Clark River. Gillnets and beach seines were typically used to harvest late-run salmon in Chignik Lake (Hutchinson-Scarbrough and Fall 1996:49).

During the years of the cooperative fishery (2002–2005), some changes occurred within area subsistence fishing patterns. Because many of the permit holders for Chignik were also area families who relied on subsistence fishing to feed their families, they would often use their commercial fishing boats to fish prior to the commercial fishing season. During these years, ADF&G opened the cooperative commercial fishery in early June, when many participants would have been processing their subsistence fish, and the nature of the management of the cooperative fishery resulted in fewer fish passing in the lagoon but at a steadier rate rather than experiencing pulses of fish that historically arrived when the competitive-only fishery was in operation. The management of the cooperative fishery resulted in a decrease in efficiency and an increase in effort for harvesting subsistence salmon in Chignik Lagoon.

According to verbal testimony by some Chignik families to Division of Subsistence personnel, many families had to wait until later in the summer to subsistence fish, and then the flies created spoilage. Other area residents reported both positive and negative changes occurring with their subsistence harvests and cash economy because of the creation of the cooperative commercial fishery. The cooperative fishing years resulted in a regulatory change that removed the restrictions on subsistence fishing for commercial fishers who could fish for subsistence throughout the summer if it was not done at the same time as a commercial opening and a permit was obtained. Fishers without a commercial permit and who wished to subsistence fish as before could fish for subsistence at any time if they had a subsistence permit. In addition, there was a reported increase in the amount of fish removed from the cooperative boats for home pack that were given to area residents to supplement their subsistence harvests. At that time, subsistence

users informed ADF&G that despite the adjustments to the CMA subsistence fishery, which allowed for more opportunity for subsistence fishing, some were still having difficulty obtaining their subsistence salmon in 2004 and 2005.

In 2002 and 2004, the USFWS implanted radio transmitters in sockeye salmon in August and early September to determine when sockeye salmon targeted in the late season subsistence fishery passed the Chignik weir. The results of the 2002 studies are described in Anderson (2003). As stated in the regulations section of this chapter, in 2004 the BOF modified the commercial fisheries management plan for late-run sockeye salmon to allow more fish to pass into Chignik Lake in September, thus providing for subsistence harvests. Late-run sockeye salmon, which are dried, are harvested from Chignik Lake in the fall by many Chignik Area residents, including some Perryville families. In 2006, several residents, particularly from Chignik Lake, commented to ADF&G that despite the limits to the August commercial fishery, they still had difficulty acquiring their late-run salmon because they were not seeing as many fish as in prior years. They needed to fish more days to achieve harvest goals, or they harvested fewer late-run salmon. By 2006, after the cooperative commercial fishery was abolished, area subsistence patterns generally returned to the historical patterns used prior to the cooperative fishery, but on a reduced level. In 2008, there was a decrease in participation in the Chignik subsistence fishery with 89 permits issued; 39 fewer permits issued than in 2007, and 32 fewer than the previous 10-year (1996–2007) average of 121. The decline of subsistence permits issued and subsistence salmon harvested in 2008 and 2009 was likely in part a consequence of declines in the populations of the local communities, which were influenced by the U.S. financial crisis and global recession that affected the economy of these communities. This is in part evident from the more than 30% decline in value of Chignik commercial purse seine limited entry permits from 2007 to 2008 that did not rebound until 2013 (Gho 2016).

In 2010, however, there was an increase in permits with 124 issued, which was an increase from 2009 (95). In 2012, 106 permits were issued, which was nearly the same as the historical average of 104 permits, and slightly less than the recent 10-year average of 113 permits.

Numerous fish or summer camps located on the north side of Chignik Lagoon were abundantly utilized in the 1990s but were mostly abandoned by 2006. However, in 2007 through 2012, a few families that reside in Perryville continued to stay at their camps during the commercial fishing season. A Perryville family member who has maintained and continues to utilize one of these multi-generational camps indicated that these camps are summer homes that provide housing for the families when commercial fishing; however, subsistence salmon are also harvested and processed while occupying the camps (Hutchinson-Scarbrough et al. 2016).

In 2010 and 2011, gillnets, and purse seines were used to catch subsistence salmon, primarily sockeye from both runs in Chignik Lagoon and the lower mouth of Chignik River. In Chignik River, Chignik Lake and tributaries to Chignik Lake (primarily Clark River), salmon, primarily sockeye from both early and late runs, were harvested using gillnets or beach seines. In addition, beach seines and handlines were used to harvest the late-run “red fish” (sockeye salmon that have entered fresh waters and started to spawn) and “spawned-outs” (spawning sockeye), primarily at Hatchery Beach on Chignik Lake, the mouth of Clark River, or in Clark River and Home Creek. Also in 2011, sockeye salmon were harvested by handline in Black Lake, but not in 2012. Late-run or spawning fish are typically preserved by drying in the wind on racks after harvest. This method is preferred because residents report they have less fat than early-run sockeye salmon. Chinook salmon were caught in Chignik Lagoon and the Chignik River using gillnets, seines, and rod and reel, or removed from commercial harvests and preserved by smoking or canning (Hutchinson-Scarbrough et al. 2016).

Perryville subsistence patterns have not changed greatly from historical times, though fewer families are going to fish camps or summer homes located on the northern side of Chignik Lagoon. From 2011–2015 6 of these camps were occupied by Perryville residents who utilize the camps during commercial fishing and mostly for subsistence fishing for sockeye salmon. Fresh sockeye salmon are often brought back to

the village by commercial fishing families. Area streams and beaches are used extensively for the harvest of the local runs of coho, chum, and pink salmon, as well as the occasional sockeye salmon. Due to the fluctuations in river locations and stream flow, and fluctuations in salmon runs to these systems, Perryville subsistence fishers may have to use other streams and bays as far east of the village as Mitrofania Bay and as far west as Ivanof Bay to harvest their fish. Occasionally sockeye and Chinook salmon can be harvested directly off the beach near Perryville when they are migrating through the area. Fish are smoked, dried, canned, salted, and frozen by Perryville residents. Some Perryville families have relatives in Chignik Lake and travel to Chignik Lake in the fall to harvest late-run sockeye salmon for drying (Hutchinson-Scarbrough et al. 2016).

In 2015, the sockeye salmon run timing for both the early run and late run in the Chignik watershed was at least a week later than average, and the early run was noticeably smaller and composed of mostly males, though the size increased throughout the season as did the abundance of females. Both escapement goals were met (Wilburn and Stumpf 2016). Many residents of the CMA communities also observed that both runs were late and that the early sockeye run was much smaller than usual, and commented to Division of Subsistence staff during post season surveys that there were more males harvested than females. Some residents expressed concerns that even though ADF&G determined that escapement goals were met for both sockeye runs, there may not have been adequate numbers of females counted through the weir from the first run to spawn. Others commented that because the fish from the first run were smaller they had to harvest additional subsistence fish to meet their subsistence needs. Some residents noticed that air and water temperatures during the summer of 2015 were much warmer than average, and some believed that could have contributed to the late timing of the runs and smaller sizes of the salmon. A few residents found that sockeye salmon in 2015 were more difficult to catch, which they attributed to fish lying deeper than normal in the ocean and channels throughout the Chignik watershed, presumably to stay cooler. Some residents also wondered if the higher water temperatures could interfere with spawning and future salmon runs (Hutchinson-Scarbrough, 2016 field notes).

Table 7-1.–Historical subsistence salmon harvests, Chignik Area, 1977–2015.

Year	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1977	NA	NA	50	9,700	2,400	600	1,800	14,550
1978	NA	NA	50	6,000	500	600	2,100	9,250
1979	NA	NA	14	7,750	34	0	262	8,060
1980	82	37	6	12,475	32	169	478	13,160
1981	29	7	0	2,049	0	0	0	2,049
1982	59	15	3	8,532	12	0	2	8,548
1983	32	21	0	3,078	1,319	850	1,250	6,497
1984	77	64	23	8,747	464	204	330	9,768
1985	59	48	1	7,177	50	25	26	7,279
1986	74	38	4	10,347	205	77	98	10,730
1987	NA	NA	10	7,021	278	204	261	7,774
1988	80	34	9	9,073	1,455	142	54	10,733
1989	68	23	24	7,551	384	147	81	8,187
1990	72	23	103	8,099	210	115	470	8,996
1991	95	58	42	11,483	13	81	275	11,893
1992	98	19	55	8,648	709	145	305	9,862
1993	201	141	122	14,710	3,765	642	1,265	20,503
1994	219	122	165	13,978	4,055	382	1,720	20,300
1995	111	95	98	9,563	1,191	150	723	11,726
1996	119	104	48	7,357	2,126	355	2,204	12,089
1997	126	103	28	13,442	2,678	840	2,035	19,024
1998	104	72	91	7,750	1,390	186	1,007	10,424
1999	106	88	243	9,040	1,679	136	1,191	12,290
2000	130	112	163	9,561	1,802	517	1,185	13,227
2001	135	122	171	8,633	1,859	213	2,787	13,663
2002	120	86	74	10,092	1,401	23	390	11,980
2003	146	127	267	10,989	2,256	286	1,597	15,394
2004	104	57	88	7,029	1,981	202	1,047	10,347
2005	119	100	224	8,171	2,112	353	730	11,590
2006	113	79	259	8,079	1,539	275	1,035	11,187
2007	128	83	84	10,191	1,936	165	996	13,372
2008	89	69	41	7,189	877	57	619	8,783
2009[a]	95	82	104	6,785	1,174	137	707	8,907
2010[a]	124	90	188	8,148	1,820	222	656	11,034
2011	95	76	52	10,578	1,458	355	1,289	13,732
2012[a]	106	87	116	5,607	1,488	220	810	8,242
2013[a]	112	96	79	6,588	916	164	686	8,433
2014	113	101	148	7,855	1,401	207	339	9,950
2015	123	119	160	9,854	1,393	233	481	12,121
5-year average (2010–2014)	110	90	117	7,755	1,417	234	756	10,278
10-year average (2005–2014)	109	86	129	7,919	1,472	216	787	10,523
Historical average (1977–2014)	104	73	85	8,660	1,289	249	863	11,146

-continued-

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017); Quimby and Owen (1994) for 1976–1979 and 1987.

Note NA indicates data not available. Information regarding the number of permits issued and returned was collected; however, the records containing this information no longer exist. Harvest data for these years are also recorded in ADF&G Division of Commercial Fisheries and Division of Sport Fish area management reports.

a. From 1993–2008, 2011, and 2014 postseason household surveys were conducted to supplement harvest data collected through returned permits. Limited budgets prevented administering the surveys for 2009, 2010, 2012, and 2013 likely resulting in an underestimate of subsistence harvests since not all subsistence fishing households obtained a permit. To compensate for this underestimate, the average annual harvest for the period 1999–2008 and 2011 reported during post-season surveys was added to harvests from returned permits to estimate the total subsistence harvest for 2009, 2010, 2012, and 2013.

Table 7-2.–Estimated subsistence salmon harvests by community of residence, Chignik Area, 2015.

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Chignik Bay	14	12	63	1,258	35	0	2	1,358
Chignik Lagoon	20	20	54	2,813	153	0	10	3,030
Chignik Lake	20	20	2	2,250	125	0	4	2,381
Perryville	35	33	35	2,050	1,046	213	454	3,798
Subtotal, Chignik Area residents	**89**	**85**	**154**	**8,371**	**1,359**	**213**	**470**	**10,567**
Anchorage	7	7	1	110	28	0	0	139
Chugiak	2	2	0	275	0	0	0	275
Craig	1	1	0	0	0	0	0	0
Fairbanks	2	2	1	34	0	0	1	36
Homer	4	4	2	307	6	0	0	315
Kodiak	9	9	2	193	0	0	0	195
Ouzinkie	1	1	0	0	0	0	0	0
Petersburg	1	1	0	80	0	0	0	80
Seldovia	1	1	0	200	0	20	10	230
Seward	2	2	0	168	0	0	0	168
Soldotna	1	1	0	0	0	0	0	0
Unalaska	1	1	0	76	0	0	0	76
Wasilla	2	2	0	40	0	0	0	40
Subtotal, other Alaska residents	**34**	**34**	**6**	**1,483**	**34**	**20**	**11**	**1,554**
Total	**123**	**119**	**160**	**9,854**	**1,393**	**233**	**481**	**12,121**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 7-3.–Estimated subsistence salmon harvests by species and subarea of harvest, Chignik Area, 2015.

Subarea of harvest[a]	Estimated salmon harvest					
	Chinook	Sockeye	Coho	Chum	Pink	Total
Chignik Bay and Lagoon	*89*	*5,480*	*68*	*20*	*22*	*5,679*
Chignik Bay	39	709	17	20	20	804
Chignik Lagoon	51	4,771	51	0	2	4,875
Chignik Lake	*36*	*2,997*	*254*	*0*	*5*	*3,293*
Chignik Lake	2	1,004	23	0	0	1,030
Chignik River	34	962	231	0	5	1,232
Clark River	0	1,015	0	0	0	1,015
Black Lake	0	16	0	0	0	16
Perryville	*35*	*1,377*	*1,071*	*213*	*454*	*3,150*
Perryville	35	1,222	997	183	435	2,872
Kametolook River	0	8	16	0	11	35
Ivanof Bay to Humpback Bay	0	86	58	30	8	182
East of Perryville	0	61	0	0	0	61
Total	**160**	**9,854**	**1,393**	**233**	**481**	**12,121**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. The Chignik Bay-Lagoon Subarea corresponds to the portion of the Central District and the Chignik Bay District, not including any of the Chignik River from the outlet of Chignik Lake ("FRI Point" to the River's outlet at Mensis Point in Chignik Lagoon). The Chignik Lake Subarea includes subsistence harvests in the Chignik River from Mensis Point in Chignik Lagoon up to Black Lake. The Perryville Subarea corresponds to the Perryville and Western districts, including Ivanof Bay, Mitrofania Bay, the Kametolook River and other streams near Perryville and Ivanof Bay. In recent years there have been no subsistence harvests reported for the Eastern District.

Table 7-4.–2015 Chignik area subsistence salmon harvests by species, fishing location, and date.

Sub area	Estimated salmon harvest					
	Chinook	Sockeye	Coho	Chum	Pink	Total
Harvest before 6/20						
Chignik Bay	37	115	0	0	0	152
Chignik Lagoon	13	2,684	0	0	0	2,697
Chignik Lake	0	422	0	0	0	422
Chignik River	0	59	0	0	0	59
Perryville	6	344	0	0	11	361
Ivanof Bay to Humpback Bay	0	73	0	0	0	73
Subtotal, early harvest	**57**	**3,697**	**0**	**0**	**11**	**3,764**
Harvest on or after 6/20						
Chignik Bay	1	594	17	20	20	652
Chignik Lagoon	38	2,087	51	0	2	2,178
Chignik Lake	2	582	23	0	0	608
Chignik River	34	903	231	0	5	1,173
Clark River	0	1,015	0	0	0	1,015
Black Lake	0	16	0	0	0	16
Perryville	29	878	997	183	424	2,511
Kametolook River	0	8	16	0	11	35
Ivanof Bay to Humpback Bay	0	13	58	30	8	109
East of Perryville	0	61	0	0	0	61
Subtotal, late harvest	**103**	**6,157**	**1,393**	**233**	**471**	**8,357**
Total	**160**	**9,854**	**1,393**	**233**	**481**	**12,121**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 7-5.–Federal subsistence salmon harvests by community, Chignik Management Area, 2015.

	Permits		Reported salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Chignik Lagoon	2	2	14	6	0	0	0	20
Total	**2**	**2**	**14**	**6**	**0**	**0**	**0**	**20**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 7-6.–Chignik area salmon removed from commercial catch for home use, 1994–2014.

Year	Salmon harvest					
	Chinook	Sockeye	Coho	Chum	Pink	Total
1994	0	0	0	0	0	0
1995	64	0	913	5	0	982
1996	40	40	20	21090	5262	26,452
1997	88	664	0	0	0	752
1998	108	267	27	155	0	557
1999	211	26	200	3	0	440
2000	20	0	0	0	0	20
2001	90	217	7	129	7	450
2002	77	1,371	164	0	0	1,612
2003	309	2,411	74	0	407	3,201
2004	158	1690	0	0	0	1,848
2005	271	1,364	5	115	234	1,989
2006	68	267	175	0	0	510
2007	16	205	56	1	0	278
2008	15	0	0	0	0	15
2009	75	93	0	1	0	169
2010	118	973	0	0	7	1,098
2011	142	323	16	0	0	481
2012	51	513	0	240	22	826
2013	85	587	28	0	0	700
2014	35	6	0	0	0	41
2015[a]	236	887	48	10	12	1,193
5-year average (2010–2014)	86	480	9	48	6	629
10-year average (2005–2014)	88	433	28	36	26	611
Historical average (1977–2012)	97	525	80	1,035	283	2,020

Source Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak.
a. The harvest for 2015 includes reported salmon from both commercial fish tickets as well as household surveys.

Table 7-7.–Subsistence uses of nonsalmon finfishes by community, Chignik Area, 1989.

Common English name	Scientific name	Percentage of households using in				
		Chignik Bay	Chignik Lagoon	Chignik Lake	Ivanof Bay	Perryville
Pacific herring	*Clupea pallasi*	23	47	29	29	15
Pacific herring spawn on kelp		14	0	5	0	4
Rainbow smelt[a]	*Osmerus mordax*	11	0	48	0	0
Eulachon (candlefish)	*Thaleichthys pacificus*	23	40	33	100	78
Pacific cod (gray cod)	*Gadus macrocephalus*	29	60	48	86	63
Walleye pollock	*Theragra chalcogramma*	3	0	0	0	0
Kelp greenling	*Hexagrammos decagrammus*	11	0	10	0	30
Pacific halibut	*Hippoglossus stenolepis*	89	100	67	100	96
Sculpin	Various species	11	0	5	0	30
Starry flounder	*Platichthys stellatus*	6	0	19	14	0
Sablefish (black cod)	*Anoplopoma fimbria*	0	7	5	0	0
Black rockfish	*Sebastes melanops*	0	7	0	0	22
Red (yelloweye) rockfish	*Sebastes ruberrimus*	3	0	0	0	4
Rainbow trout	*Oncorhynchys mykiss*	3	0	24	57	7
Steelhead trout	*Oncorhynchys mykiss*	0	13	5	0	0
Dolly Varden	*Salvelinus malma*	23	7	38	86	56
Arctic grayling	*Thymallus arcticus*	0	0	0	14	0
Any nonsalmon fish		89	100	86	100	96

Source CSIS; Hutchinson-Scarbrough and Fall (1996).

a. Most likely harvested outside the Chignik Management Area; Chignik area households receive gifts of rainbow smelt from relatives and friends in Pilot Point, Ugashik, and Naknek, among other communities.

Table 7-8.–Subsistence uses of nonsalmon finfishes by community, Chignik Area, 2003.

Common English name	Scientific name	Percentage of households using in Chignik Bay	Chignik Lagoon	Chignik Lake	Perryville
Pacific herring	*Clupea pallasi*	0	6	0	0
Eulachon (candlefish)	*Thaleichthys pacificus*	0	13	0	81
Pacific cod (gray cod)	*Gadus macrocephalus*	36	44	48	44
Walleye pollock	*Theragra chalcogramma*	5	0	0	0
Lingcod	*Ophiodon elongatus*	27	38	0	4
Unknown greenling	Various species	0	0	0	11
Pacific halibut	*Hippoglossus stenolepis*	95	94	90	81
Unknown sculpin	Various species	0	0	0	7
Unknown Irish lord	*Hemilepidotus* spp.	0	0	0	11
Starry flounder	*Platichthys stellatus*	0	0	5	4
Unknown flounder	Various species	0	0	5	4
Sablefish (black cod)	*Anoplopoma fimbria*	18	19	0	19
Black rockfish	*Sebastes melanops*	27	25	19	19
Red (yelloweye) rockfish	*Sebastes ruberrimus*	23	25	0	4
Skates	Various species	0	6	0	4
Unknown Sole	Various species	0	6	0	0
Dolly Varden	*Salvelinus malma*	36	6	19	26
Rainbow trout	*Oncorhynchys mykiss*	36	13	10	0
Steelhead trout	*Oncorhynchys mykiss*	5	6	10	0
Any nonsalmon fish		95	94	90	93

Source CSIS

Note Ivanof Bay was not surveyed in 2003.

Table 7-9.–Subsistence uses of marine invertebrates by community, Chignik Area, 1989.

Common English name	Scientific name	Percentage of households using in Chignik Bay	Chignik Lagoon	Chignik Lake	Ivanof Bay	Perryville
Alaska razor clam	*Siliqua patula*	14	33	24	43	37
Butter clam	*Saxidomus giganteus*	71	67	52	71	41
Gaper clam	*Tresus capax*	11	0	0	0	4
Nuttall cockle	*Clinocardium nuttallii*	37	7	48	100	70
Pinkneck clam (redneck)	*Spicula polynuma*	0	0	0	71	4
Pacific littleneck (steamer) clam	*Protothaca staminea*[a]	11	0	0	29	11
Chiton, black (leather)	*Katharina tunicata*	49	27	57	100	93
Chiton, red (gumboot)	*Cryptochiton stelleri*	0	0	0	86	11
Mussel (blue)	*Mytilus trossulus*	9	7	0	14	15
Octopus	*Octopus* spp.	43	20	48	71	52
Sea urchin	*Stronglyocentrotus* spp.	29	0	48	100	89
Sea cucumber	Various species	0	0	0	0	4
Shrimp	*Pandalus* spp	9	0	5	0	0
Giant Pacific scallop	*Pecten caurinus*	3	0	0	0	0
Red king crab	*Paralithades camtschatica*	40	20	33	43	0
Dungeness crab	*Cancer magister*	37	40	48	100	52
Tanner crab	*Chionoecetes bairdi*	63	67	14	0	4
Snail	*Neptunea* spp	3	0	0	0	4
Limpet	*Acmaeidae* spp	3	0	0	0	4
Any marine invertebrates		89	87	81	100	96

Source CSIS; Hutchinson-Scarbrough and Fall (1996).

a. May also include smaller-sized individuals of other species and softshell clams of the genus *Mya*.

Table 7-10.–Subsistence uses of marine invertebrates by community, Chignik Area, 2003.

Common English name	Scientific name	Percentage of households using in Chignik Bay	Chignik Lagoon	Chignik Lake	Perryville
Alaska razor clam	*Siliqua patula*	32	63	29	22
Butter clam	*Saxidomus giganteus*	77	88	90	85
Gaper clam	*Tresus capax*	0	0	0	7
Pinkneck clam (redneck)	*Spicula polynuma*	5	6	0	19
Pacific littleneck (steamer) clam	*Protothaca staminea*[a]	27	44	19	37
Chiton, black (leather)	*Katharina tunicata*	55	19	81	85
Chiton, red (gumboot)	*Cryptochiton stelleri*	18	0	10	41
Mussel (blue)	*Mytilus trossulus*	0	7	0	0
Unknown clams	Various species	5	0	0	0
Unknown cockles	Various species	27	0	33	67
Unknown mussels	Various species	0	0	0	26
Octopus	*Octopus* spp	64	25	76	63
Sea urchin	*Stronglyocentrotus* spp	45	13	52	74
Giant Pacific scallop	*Pecten caurinus*	0	0	0	7
Red king crab	*Paralithades camtschatica*	0	13	0	7
Unknown king crab	Various species	0	6	0	0
Dungeness crab	*Cancer magister*	59	25	0	59
Tanner crab	*Chionoecetes bairdi*	77	75	57	67
Unknown Tanner crab	*Chionoecetes* spp.	5	6	0	0
Snail	*Neptunea* spp	0	0	0	11
Limpet	*Acmaeidae* spp	5	0	0	7
Any marine invertebrates		91	100	90	96

Source CSIS

Note Ivanof Bay was not surveyed in 2003.

a. May also include smaller-sized individuals of other species and softshell clams of the genus *Mya*.

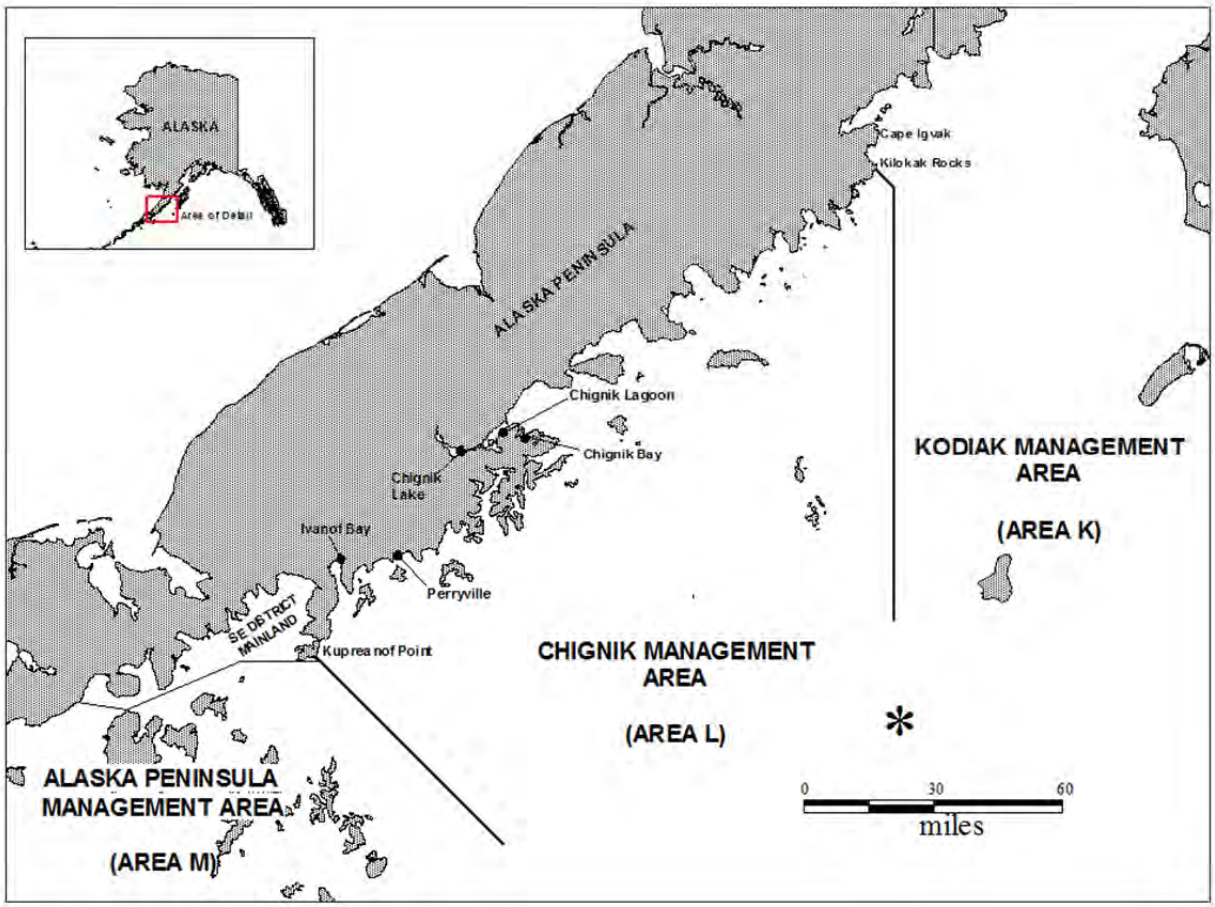

Figure 7-1.–Location of Chignik Management Area (CMA) and communities within the CMA on Alaska Peninsula.

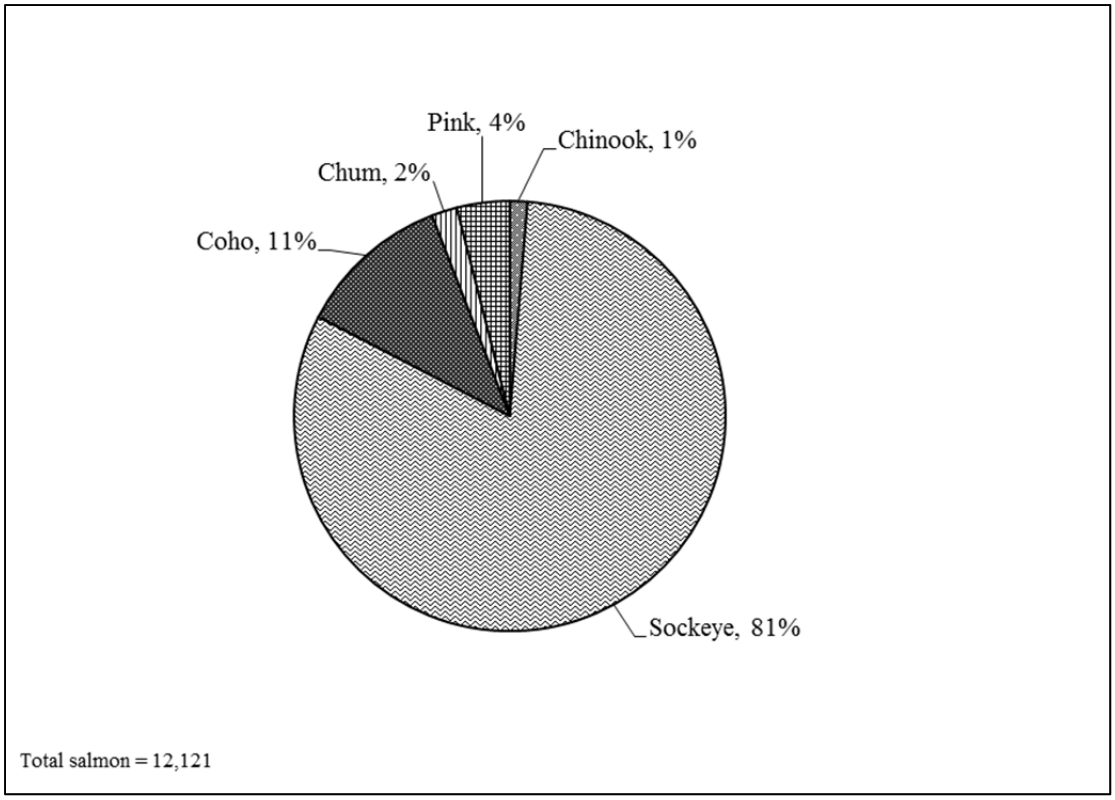

Figure 7-2.–Composition of Chignik Area subsistence salmon harvest by species, 2015.

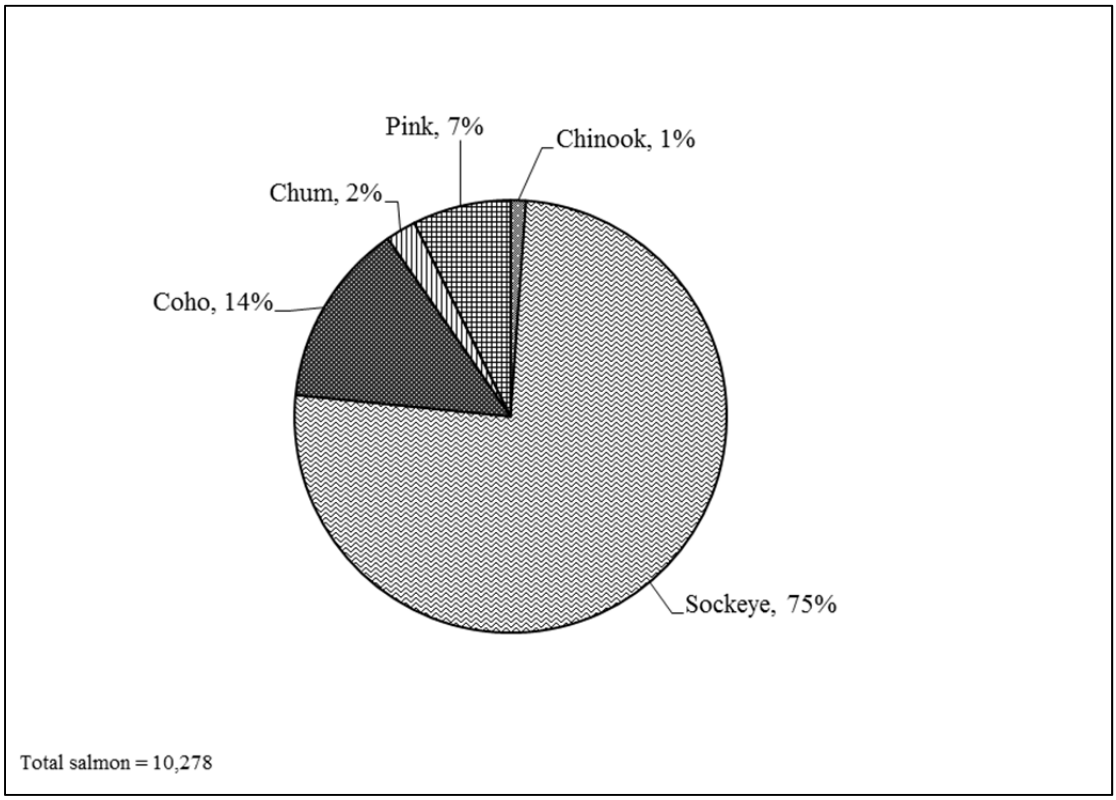

Figure 7-3.–Species composition of Chignik Area subsistence salmon harvests, 2010–2014.

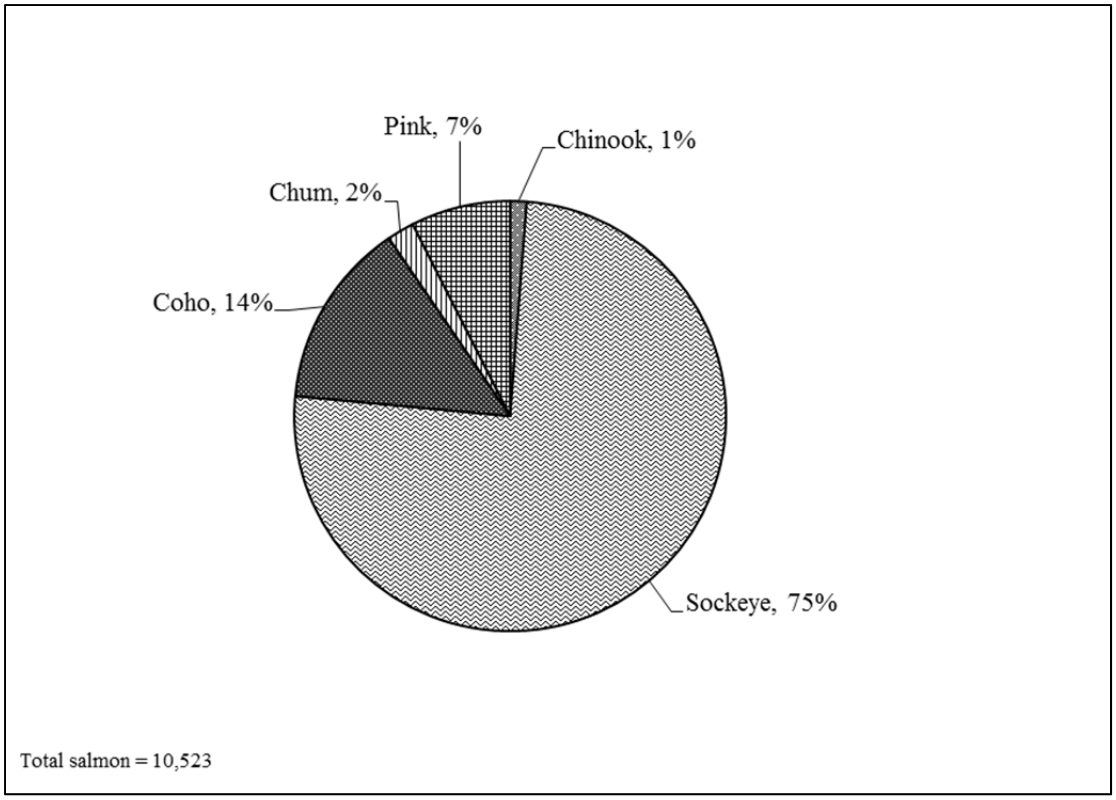

Figure 7-4.–Species composition of Chignik Area subsistence salmon harvests, 2005–2014.

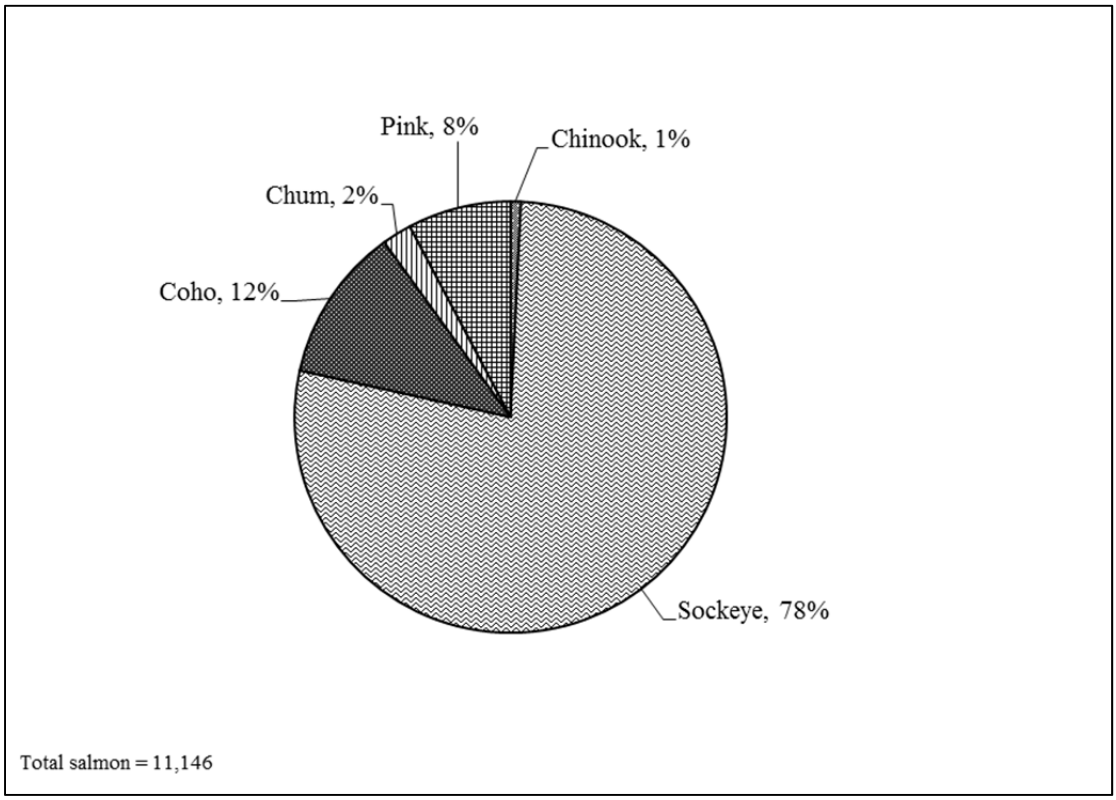

Figure 7-5.–Species composition of Chignik Area subsistence salmon harvests, 1977–2014.

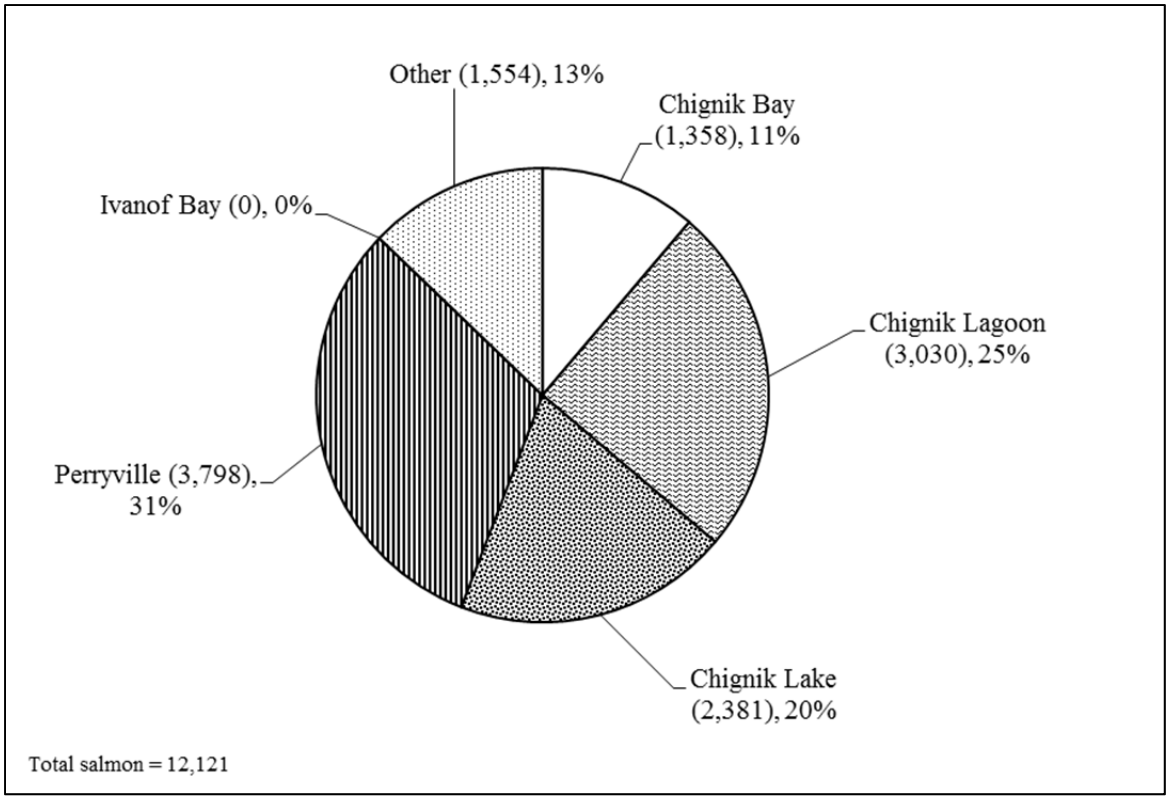

Figure 7-6.–Subsistence salmon harvests by community, Chignik Area, 2015.

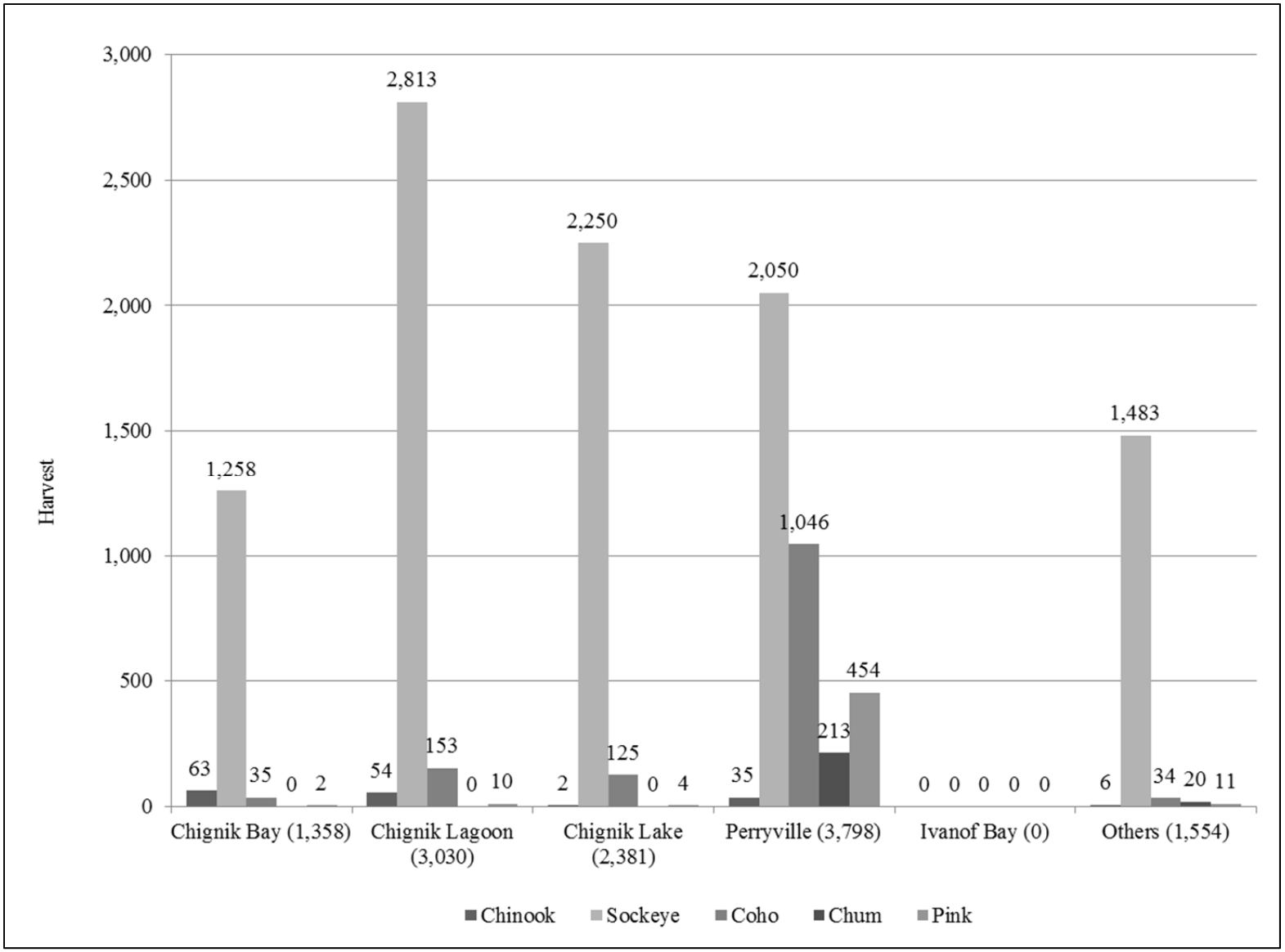

Figure 7-7.–Subsistence salmon harvests by community, Chignik Area, 2015

CHAPTER 8: ALASKA PENINSULA AREA

BACKGROUND

The Alaska Peninsula Salmon Management Area (Area M) includes all the waters of Alaska on the north side of the Alaska Peninsula southwest of a line from Cape Menshikof to Cape Newenham and east of the longitude of Cape Sarichef Light and on the south side of the Alaska Peninsula from a line extending from Scotch Cap through the easternmost tip of Ugamak Island to a line extending 135 degrees southeast from Kupreanof Point (5 AAC 01.400). The area for salmon management purposes is divided into two portions; the North Alaska Peninsula portion includes the waters from Cape Menshikof west to Cape Sarichef, and the South Alaska Peninsula includes the waters from Kupreanof Point west to Scotch Cap on Unimak Island (Keyse and Fox 2015). The communities of the Alaska Peninsula Area and their respective estimated populations as of July 2015 are Port Heiden (population 114), Nelson Lagoon (population 39), False Pass (population 44), Cold Bay (population 78), King Cove (population 925), and Sand Point (population 950).[1]

Port Moller has no year-round population and is only seasonally occupied from May–September. Port Heiden is in the Lake and Peninsula Borough; the other communities are in the Aleutians East Borough (which also includes Akutan in the Aleutian Islands Area).

REGULATIONS

A subsistence permit, which must be used to record daily harvests, is required for fishing in the Alaska Peninsula Area. There is an annual limit of 250 salmon per household but a permit holder may obtain an additional permit from the department (5AAC 01.430). Legal gear includes seines and gillnets or as otherwise specified on a permit. In waters open to subsistence fishing, no set gillnet may exceed 100 fathoms in length and no drift gillnet may exceed 200 fathoms in length. In areas open to commercial salmon fishing, salmon can only be taken with gillnets of not more than 50 fathoms in length (5AAC 01.420). Seines may not be longer than 250 fathoms or deeper than 375 meshes. Seine mesh size, other than mesh above the leadline, may not be greater than 3.5 inches stretched measure. The first 25 meshes above the leadline must be 7 inches or less stretched measure. Other standard permit conditions include prohibition of fishing within 300 ft of a dam, fish ladder, weir, culvert, or other artificial obstruction. The Alaska Administrative Code (5 AAC 01.423) includes special provisions regarding subsistence gear for other areas, including Mortensens Lagoon, the False Pass vicinity, and Bear and Sandy rivers. Salmon may be taken at any time, except in those districts and sections that are open to commercial salmon fishing, salmon may not be taken during the 24 hours before and 12 hours following a commercial salmon fishing period. A few small areas closed to subsistence salmon fishing are listed in 5 AAC 01.425.

Federal regulations governing subsistence salmon fishing in waters under the jurisdiction of the Federal Subsistence Board are generally identical to the state regulations summarized above, with the exception that in addition to gillnet and seine, rod and reel, handline, spear, bow and arrow, and bare hand capture are all legal subsistence gear under federal rules for federally qualified rural residents. There is no separate federal subsistence permit; a state permit is required for subsistence fishing under the federal regulations. Additional information about the federal subsistence fishery is available by contacting the United States Fish and Wildlife Service, Office of Subsistence Management in Anchorage, Alaska.

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 22, 2017. http://live.laborstats.alaska.gov/pop/index.cfm

HARVEST ASSESSMENT PROGRAM

The Division of Commercial Fisheries has issued subsistence permits for the Alaska Peninsula Area since 1979. Except for residents of Sand Point and Cold Bay, permits are mailed each year to fishers who returned their permits at the end of the previous fishing season. Sand Point and Cold Bay residents are issued permits upon request at the ADF&G offices in Sand Point and Cold Bay. Permits are also issued upon request at other ADF&G offices and by mail to people who telephone to request them. Regulations require that permits be returned to ADF&G by October 31. Reminder letters are sent around November 1 to people who have not yet returned their permits. If a person does not return the permit, his or her name is removed from the mailing list. Data from returned permits are tabulated by species and fishing area. Harvest data from returned permits are expanded by community of residence to estimate the harvest by all permit holders.

SUBSISTENCE SALMON HARVESTS IN 2015

From 1985 through 2014, the number of subsistence salmon permits issued for the Alaska Peninsula Area averaged 190 per year (Table 8-1). The recent 5-year average (2009–2014) was 173 permits. In 2015, 158 subsistence salmon fishing permits were issued for the Alaska Peninsula Area which was a decreased compared to the previous year when 177 permits were issued. This compares to the 241 Commercial Fishery Entry Commission (CFEC) permits issued for the commercial salmon fishery for the Alaska Peninsula Area in 2014 (Keyse and Fox 2015). The response rate for subsistence permits was 71% in 2014 (112 of 158 permits were returned). Of all subsistence permits issued, 113 (72%) were issued to residents of Alaska Peninsula Area communities, and 45 (28%) were issued to residents of other Alaska communities (Table 8-2). Most nonlocal residents fish at Mortensens Lagoon which is located approximately 9 road miles southeast of Cold Bay, primarily because of easy road access from the Cold Bay airport which provides economically feasible transportation options (Tschersich and Russ 2008). Also Mortensens Lagoon, Thin Point Lagoon located 12 miles west of King Cove, and Leonard Harbor near the King Cove road system are some of the primary areas utilized for obtaining subsistence sockeye and coho salmon particularly for King Cove and Cold Bay residents (Johnson and Fox 2015).

The estimated total subsistence salmon harvest in the Alaska Peninsula Area in 2015 was 20,693 fish. This is a 60% increase from the prior year (12,927 salmon in 2014) and nearly double the recent 5-year (2010–2014) (13,587 salmon) and 10-year (2005–2014) (13,307 salmon) averages and a 20% increase from the historical average (1985–2014) of 17,312 fish (Table 8-1). The 2015 subsistence harvest consisted of 59% sockeye salmon (12,107), 24% pink salmon (4,919), 10% coho salmon (2,131), 7% chum salmon 1,419), and 1% Chinook salmon (117) (Table 8-1; Figure 8-1).

All estimated salmon harvests in 2015 increased compared to the 2014 harvests with chinook and pink salmon having the greatest increases of 121% and 187% respectively. The Chinook and, to a lesser degree, coho salmon harvests, however, decreased compared to recent 5-year (2010–2014), 10-year (2005–2014) and historical (1985–2014) average harvests. Chinook salmon harvests in 2015 totaled only 117 fish, a 53%, 48%, and 62% decline from the previous 5-year (250), 10-year (228), and historical (308) averages respectively. The 2015 coho harvest of 2,131 was close to the 5-year historical average of 2,186 with only a 3% decrease; had a 21% decline from the 10-year average (2,702); and a 49% decline from the 1985–2014 historical average. The 2015 chum harvest (1,419) varied as compared to recent and historical averages, being a 27% increase from the 5-year average (1,113); a 54% increase from the 10-year average (920); and a 20% decline from the historical (1985–2014) average of 1,773 chum salmon (Table 8-1).

Sockeye salmon and pink salmon 2015 estimated harvests, by contrast to the other species, increased from their previous year harvests as well as the 5-year, 10-year, and historical averages. The sockeye salmon harvest in 2015 (12,107) was a 36% increase from 2014 harvests (8,910) and the 5-year average (8,871) and a 26% increase from the 10-year average (9,636). Pink salmon harvests in 2015 totaled 4,919

which was 187% higher than the previous year (1,704); 321% higher than the recent 5-year (2009–2014) average (1,167); 245% higher than the historical (1985–2014) average (1,422); and the highest estimated harvest over the 1985–2015 period (Table 8-1).

Of the total salmon harvested in 2015, the residents of Sand Point harvested 63% (13,021 fish); King Cove residents 21% (4,335); Cold Bay residents 4% (748); False Pass residents 4% (927); Nelson Lagoon residents, 2% (360); and Port Heiden residents had no reported harvests based on permit returns. Port Moller is only a summer residence for commercial fishermen; seasonal residents could account for the 159 salmon that were reported harvested from this community. Other Alaska residents not residing year around in any of the Alaska Peninsula Management Area communities, harvested 1,142 salmon, which represented 6% of the total harvest for this area in 2015 (Table 8-2; Figure 8-2).

Fish removed from commercial salmon harvests for personal use, referred to locally as "home pack", can also be an important source of personal use salmon. Commercial salmon fisherman in the South Alaska Peninsula Area in 2015 reported removing a total of 5,590 salmon for personal use from their commercial salmon harvest, of which 67% (3,746) were pink salmon; 17% (926) sockeye salmon; 9% (505) were Chinook salmon; 6% (328) coho salmon; and 1% (85) chum salmon. Commercial salmon fisherman in the North Alaska Peninsula reported removing a total of 429 salmon for personal use in 2015, of which 93% (400) were sockeye salmon and 7% (29) were coho salmon. Although homepack reporting is required on commercial harvest tickets (5AAC39.130(c)12)), the harvest ticket data may not be accurate due to inconsistent reporting with some homepack salmon recorded on commercial fisher's subsistence permits rather than commercial harvest tickets.[2] The subsistence permit program for the Alaska Peninsula Area is not designed to account for salmon withheld from commercial catches for home uses. This number may be substantial, especially in years when commercial salmon prices are low. This is supported historically, with 1992 data from household harvest surveys estimating that 51% of the salmon harvested for home use in King Cove (Fall, Mason, et al. 1993) and 45% in Sand Point (Fall, Andersen, et al. 1993), were removed from commercial harvests.

In interviews with Division of Subsistence staff in 2000, fishery managers for the Alaska Peninsula Area expressed the view that the subsistence permit program did not completely document all subsistence salmon harvesting activities because some fishers did not obtain permits (Fall and Shanks 2000:30). A comparison of permit and household interview data for 1992 for King Cove found that about 31% of interviewed households that reported subsistence fishing did not have permits (Fall, Mason, et al. 1993:58–62). The estimated total subsistence salmon harvest for the community based on the interviews was 7,036 (±1,773), compared to 5,856 based on permit returns (Fall, Mason, et al. 1993:58–62.). At Sand Point in the same year, 41% of interviewed households reported that they harvested salmon for subsistence but did not have permits. The estimated total subsistence salmon harvest for Sand Point based on the household interviews was 11,338 (±2,551), compared to 7,833 based on estimates using permit return information (Fall, Andersen, et al. 1993:61).

In 2002 and 2003, the Division of Subsistence conducted the "Subsistence Fisheries Harvest Assessment and Traditional Ecological Knowledge (TEK), Lower Alaska Peninsula and Aleutian Islands" project, funded in part by OSM under project number 02-032. The goals of the project were to generate harvest data for salmon to supplement estimates produced through the subsistence permit program and to collect TEK about fisheries resources. Among other findings, the research documented that King Cove households removed 2,304 salmon from their commercial harvests for home uses in 2003, representing 24% of the total salmon harvest for home uses in the community (Davis 2005:116). Another product was a searchable TEK database called "The View from the Beach." For detailed study findings, consult Davis (2005). The Division will commence research in 2016 in the communities of Port Heiden, Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville, and Egegik to further understanding of salmon sharing and harvest practices in the region and surrounding area.

2. Elizabeth Fox, ADF&G Area Management Biologist, Alaska Peninsula and Aleutian Islands, Personal Communication, December 29, 2017.

OTHER SUBSISTENCE FISHERIES

Subsistence Pacific halibut fishing harvest estimates for communities and tribes in the Alaska Peninsula Area are available for 2003–2012 and 2014 (Fall and Lemons 2016). Due to a lapse in funding, subsistence Pacific halibut fishing harvest estimates were not collected for 2013 or 2015. The primary method used for obtaining subsistence halibut harvest estimates state wide is through the use of mail-out surveys. In addition, in 2014 a special objective also included in person interviews with active subsistence halibut permit holders in the communities of King Cove and Sand Point (Fall and Lemons 2016).

There are no other annual harvest assessment programs for the other finfish and shellfish subsistence fisheries of the Alaska Peninsula Area. To date, the Division of Subsistence has conducted one systematic household harvest survey in each of the area's communities, except Cold Bay. The findings of these surveys, including species used, percentage of households harvesting each species in the study year, and estimated harvest quantities for the study year, appear in the CSIS. Table 8-3 reports the percentage of households in the surveyed communities that used selected nonsalmon finfish species in the available study year. Generally, Pacific cod, halibut, and Arctic char/Dolly Varden were the most frequently used by households in these communities. The Division will conduct systematic surveys in the spring of 2016 that will include data collection of harvest practices for a comprehensive list of resources as well as salmon sharing practices in Cold Bay, Sand Point, and King Cove.

Nonsalmon subsistence harvest data are also available for Nelson Lagoon, Port Heiden, and False Pass for 2009 (Reedy-Maschner and Maschner 2012). The per capita edible weight of nonsalmon fish reported for Nelson Lagoon in this study was 15.5 lb, for Port Heiden 13.7 lb, and for False Pass, 117.9 lb. The higher per capita harvests reported for False Pass represents a much greater harvest of Pacific halibut. Pacific halibut represented the highest per capita subsistence harvest among nonsalmon fish in each of these communities except Nelson Lagoon where it was surpassed by unknown trout. For more information, refer to Reedy-Maschner and Maschner (2012).

Table 8-1.–Historical subsistence salmon harvests, Alaska Peninsula Area, 1985–2015.

	Permits		Estimated salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1985	161	95	74	4,037	7,504	1,566	574	13,755
1986	147	84	101	5,396	2,996	1,455	1,779	11,727
1987	191	144	193	5,777	4,259	1,943	1,547	13,719
1988	183	114	257	5,501	5,646	1,692	1,666	14,762
1989	188	139	88	10,404	3,505	2,104	1,213	17,314
1990	201	157	246	8,588	4,029	1,589	736	15,188
1991	249	185	458	11,345	5,551	3,551	1,878	22,783
1992	229	177	385	10,739	4,267	2,574	1,840	19,805
1993	262	215	615	12,478	5,753	1,997	1,189	22,032
1994	256	213	674	11,884	6,086	4,406	2,206	25,256
1995	260	198	492	12,716	5,021	3,369	2,653	24,251
1996	234	178	362	12,176	7,743	2,728	2,569	25,578
1997	217	172	420	15,224	4,612	2,885	2,955	26,096
1998	233	153	407	12,920	5,820	1,326	2,286	22,759
1999	185	148	391	15,119	4,961	2,235	2,136	24,843
2000	180	152	341	9,955	5,239	1,699	950	18,185
2001	185	155	570	12,259	3,940	1,963	1,181	19,912
2002	157	133	345	9,384	3,188	1,603	532	15,052
2003	166	128	312	10,103	4,266	2,353	1,194	18,228
2004	147	135	218	9,484	3,787	951	609	15,049
2005	160	139	192	11,260	4,089	716	1,054	17,310
2006	153	131	110	7,847	2,452	910	961	12,280
2007	150	124	100	6,872	2,648	498	693	10,811
2008	199	164	280	7,623	4,355	1,078	1,687	15,022
2009	134	118	350	5,629	2,545	434	749	9,707
2010	183	138	338	9,464	2,898	1,274	985	14,959
2011	163	117	337	9,871	2,353	835	1,070	14,466
2012	172	138	287	9,429	1,936	1,637	941	14,231
2013	172	157	235	6,683	2,222	1,080	1,133	11,353
2014	177	156	53	8,910	1,523	737	1,704	12,927
2015	158	112	117	12,107	2,131	1,419	4,919	20,693
5-year average (2010–2014)	173	141	250	8,871	2,186	1,113	1,167	13,587
10-year average (2005–2014)	166	138	228	8,359	2,702	920	1,098	13,307
Historical average (1985–2014)	190	149	308	9,636	4,173	1,773	1,422	17,312

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 8-2.–Subsistence salmon harvest estimates by community, Alaska Peninsula Area, 2015.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Cold Bay	19	18	0	748	0	0	0	748
False Pass	9	2	5	23	900	0	0	927
King Cove	39	25	0	3,044	1,080	75	137	4,335
Nelson Lagoon	3	2	12	267	66	11	5	360
Port Moller	1	1	0	159	0	0	0	159
Sand Point	42	29	54	6,810	77	1,306	4,775	13,021
Subtotal, area residents	**113**	**77**	**70**	**11,050**	**2,122**	**1,392**	**4,917**	**19,551**
Anchorage	20	17	14	261	0	0	0	275
Eagle River	1	0	0	0	0	0	0	0
Fairbanks	1	1	0	0	0	0	0	0
Girdwood	1	1	0	0	0	0	0	0
Homer	5	4	0	78	9	4	3	93
Kasilof	2	1	0	200	0	0	0	200
King Salmon	1	1	0	0	0	0	0	0
Kodiak (city)	5	4	33	195	0	24	0	251
Kotzebue	1	1	0	250	0	0	0	250
Ninilchik	1	1	0	0	0	0	0	0
North Pole	1	1	0	73	0	0	0	73
Seward	2	1	0	0	0	0	0	0
Sterling	1	0	0	0	0	0	0	0
Wasilla	3	2	0	0	0	0	0	0
Subtotal, other Alaska residents	**45**	**35**	**47**	**1,057**	**9**	**28**	**3**	**1,142**
Total	**158**	**112**	**117**	**12,107**	**2,131**	**1,419**	**4,919**	**20,693**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 8-3.–Percentage of households using selected nonsalmon finfishes, Alaska Peninsula Area communities.

	Percentage of households using in that study year[a]				
Resource[b]	False Pass	King Cove	Nelson Lagoon	Port Heiden	Sand Point
Pacific cod	65	44	0	3	61
Sablefish	15	8	ND	ND	13
Kelp greenling	10	5	ND	ND	7
Flounder	20	4	8	11	4
Pacific halibut	95	73	0	22	89
Pacific herring	30	23	ND	3	14
Herring spawn on kelp	0	3	ND	3	1
Smelt	0	1	ND	49	5
Rockfishes	5	36	ND	ND	61
Sculpin	35	7	ND	ND	4
Walleye pollock	ND	3	ND	ND	2
Lake trout	ND	ND	ND	11	ND
Arctic char/ Dolly Varden	75	67	54	76	51
Rainbow trout/steelhead	5	4	ND	3	31

Source CSIS.

Note ND indicates no data for that resource.

a. Study year = 1987–1988 for False Pass; 1986–1987 for Nelson Lagoon and Port Heiden; 1992 for King Cove and Sand Point.

b. Most commonly used types in the study year; uses of other species occurred, or may occur in other years.

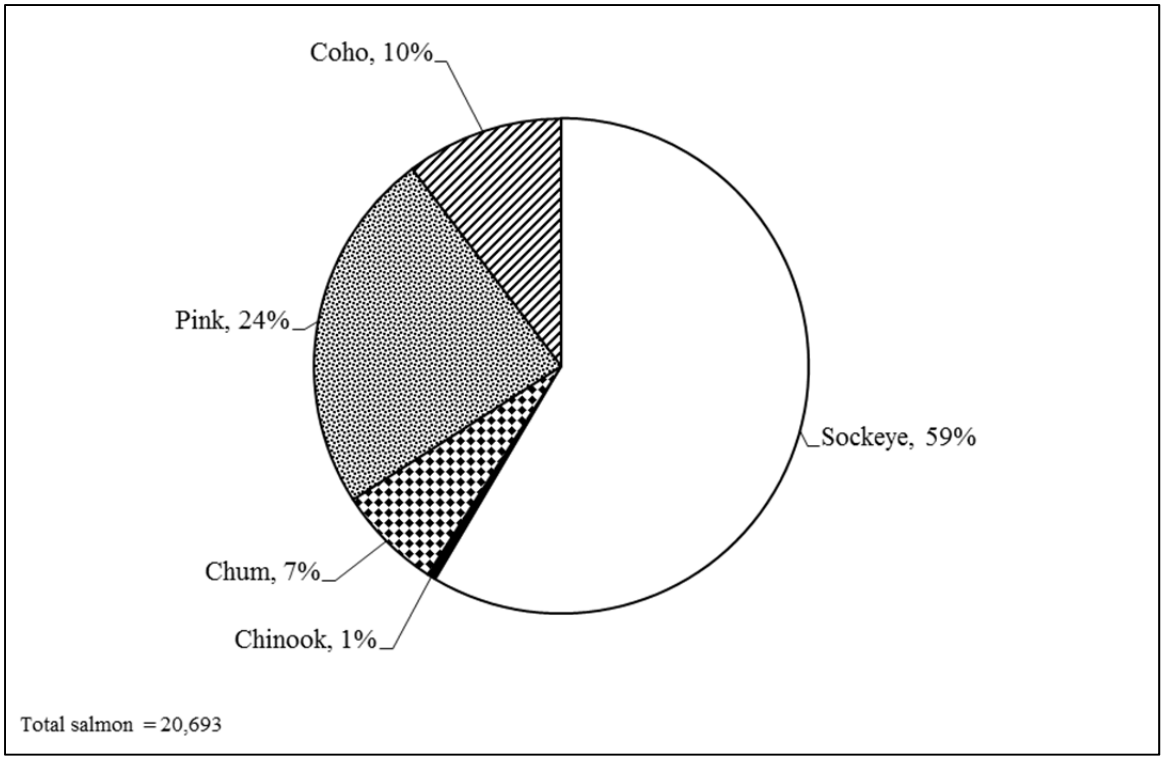

Figure 8-1.–Composition of Alaska Peninsula Area subsistence salmon harvest by species, 2015.

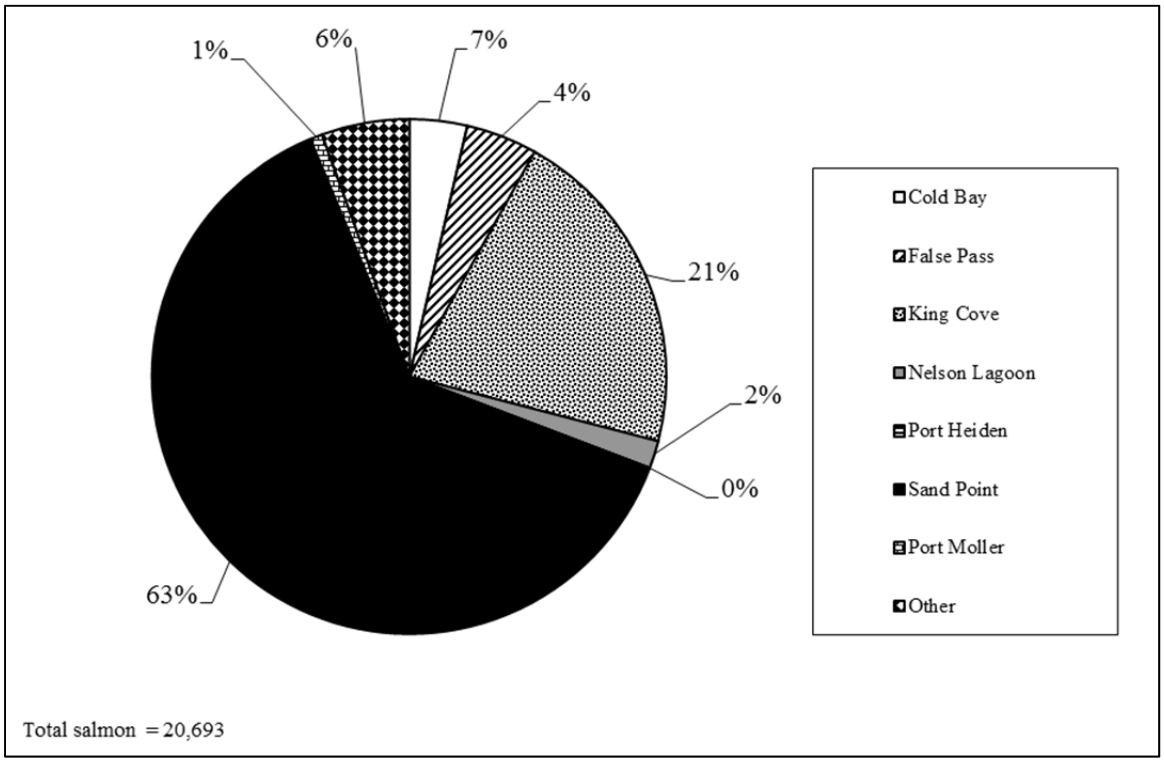

Figure 8-2.–Subsistence salmon harvests by community, Alaska Peninsula Area, 2015.

CHAPTER 9: ALEUTIAN ISLANDS AREA

INTRODUCTION

The Aleutian Islands Management Area includes all waters of Alaska in, and surrounding, the Aleutian Islands west of Cape Sarichef Light and west of a line extending from Scotch Cap through the easternmost tip of Ugamak Island, including the waters in and surrounding the Pribilof Islands (5 AAC 01.350). For subsistence purposes, the Aleutian Islands Area is divided into 6 management districts. From east to west, they are the Akutan District, Unalaska District, Umnak District, Pribilof Islands District, Atka–Amlia Islands District, and the Adak District (5 AAC 01.355). The major communities of the Aleutian Islands Area are Akutan, Unalaska–Dutch Harbor, Atka, Nikolski, St. Paul, St. George, and Adak. Akutan is part of the Aleutians East Borough; the other communities are part of the Aleutians West Census Area, but they are not within an organized borough.

According to the US Census, Akutan's population in 2010 totaled 1,027, of which only 90 people lived in a total of 40 households in the Native Village of Akutan, and the remaining 937 lived in group quarters at the adjacent Trident Seafoods processing plant. In 2015, the total Akutan population was estimated at 1,011; however, most of the people (937) were estimated as residing in group housing, and 74 resided in households. In 2010, the population of Unalaska–Dutch Harbor was 4,376 with 2,277 residents residing in a total of 927 households and the remainder (2,099) in group quarters (primarily seafood industry workers housing). In 2015, the estimated population of Unalaska–Dutch Harbor was 4,440 with 2,343 residing in households and 2,097 in group quarters. In Nikolski, the population in 2010 was 18 residing in a total of 13 households; and in 2015, the estimated population was 14. Atka in 2010 had a population of 61 residing in a total of 24 households; and the estimated population in 2015 totaled 59. Adak's 2010 census population totaled 326 people which 109 lived in a total of 44 households and 217 in group quarters; and in 2015, the estimated population was 326 total people, 217 of which were estimated to be in group quarters. [1]

Two communities are within the Pribilof Islands District. St. Paul in 2010 had a population of 479 with 455 residing in a total of 162 households and 24 residing in group quarters; and in 2015, the population was estimated at 427 with 415 residing in households and 12 people residing in group quarters. St. George's 2010 population was 102, with 98 residing in a total of 42 households, and 4 residing in group quarters; and the 2015 population estimate was 82 people; 4 of which resided in group quarters.[2,3]

The Alaska Board of Fisheries found that halibut and all other finfish in the Aleutian Islands Area and the waters surrounding the Pribilof Islands are customarily and traditionally taken or used for subsistence. The board found that (1) 13,500–23,000 salmon and (2) 200,000–330,000 usable pounds of finfish other than salmon are reasonably necessary for subsistence uses in the Aleutian Islands area (5AAC01.366).[4] Subsistence salmon harvests are monitored annually only in the Unalaska and the Adak districts, where a permit is required for harvest. A permit is not required for subsistence salmon fishing in the waters fished by the communities of Akutan, Atka, or Nikolski; therefore, subsistence salmon harvests are not systematically monitored in these communities. Harvest estimates for Akutan are based upon data in Davis (2005), from household surveys conducted in 2009 for the 2008 harvest year, and from household surveys conducted in 2010 for the 2009 study year (Reedy-Maschner and Maschner 2012). Estimates for

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed July, 2017. http://live.laborstats.alaska.gov/pop/index.cfm
2. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed July, 2017. http://live.laborstats.alaska.gov/pop/index.cfm
3. U.S. Census Bureau, Washington D.C. n.d. "American FactFinder." U.S. Department of Commerce. Accessed July, 2017. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml
4. Alaska Department of Fish and Game. 2013–2014 Subsistence and personal use statewide fisheries regulations. Alaska Department of Fish and Game, Juneau.

Atka and Nikolski are based upon data in Davis (2005). There are no native populations of salmon in the Pribilof Islands, and therefore there are no local subsistence salmon fisheries available for the communities of St. Paul and St. George.

SALMON HARVESTS IN THE UNALASKA DISTRICT

The Unalaska District includes all waters west of Akutan Pass up to, and including, Umnak Pass (5 AAC 12.200 (b)).

Salmon Harvest Regulations

A permit is required for subsistence salmon fishing in the Unalaska District. Fishers must record their daily harvests on the permit and return it to ADF&G by October 31. Permit holders may harvest up to 25 salmon per permit plus an additional 25 salmon for each member of the same household who is listed on the permit. A permit holder may obtain an additional permit from the department if more fish are needed. A record of subsistence-caught fish must be recorded on the reverse side of the permit and the permit must be returned to the department by October 31, even if no salmon were harvested (5 AAC 01.380).

Other standard permit conditions include prohibition of fishing within 300 ft of a dam, fish ladder, weir, culvert, or other artificial obstruction. Salmon may be taken from 6:00 AM until 9:00 PM beginning January 1 through December 31, except that from June 1 through September 15, a salmon seine vessel may not be used to take salmon for subsistence purposes 24 hours before, during, or 24 hours after an open commercial fishing period within a 50-mi radius of the area open to commercial fishing. Salmon may be taken by seine or gillnet, but from June 1 through September 15, a purse seine vessel may be used to take subsistence salmon only with a gillnet. In the Unalaska District, subsistence gillnets must be attended at all times while fishing. (5 AAC 01.360–5 AAC 01.370). Waters within the Unalaska District that are closed to subsistence fishing for salmon are defined in 5 AAC 01.375.

Salmon Harvest Assessment Program

The Division of Commercial Fisheries has issued subsistence salmon harvest permits for the Unalaska District since 1979. Permits are only issued in person at the ADF&G Dutch Harbor office. Unalaska District permits are required by regulation to be returned by October 31; they may be retuned in person or mailed to the ADF&G Dutch Harbor office. Reminder letters are sent on approximately November 1 to all permit holders who have not returned their permits. Data from returned permits are tabulated by species and fishing area. Harvest estimates are calculated by expanding reported harvest numbers from successfully and unsuccessfully fished permits to represent fish taken by all permit holders, including those who did not return their permits (Wilburn and Nichols 2013). Federal subsistence fisheries are authorized for permament residents residing in the Aleutian Islands Area; however they are managed consistently with the state fisheries in the region. [5]

Subsistence Salmon Harvests in 2015

In 2015, 222 subsistence salmon permits were issued for the Unalaska District, which was slightly lower than the previous year, 2014, when 249 were issued, and lower than the recent 5-year (2010–2014) average of 232 permits but slightly higher than the 10-year (2005–2014) average of 217 permits issued (Table 9-1). This number was also higher than the historical annual average (1985–2014) of 176 permits. Harvest numbers are recorded on the permit and returned at the end of the harvest season to ADF&G. In 2015, the return rate for the Unalaska District was 77%, with 172 permits returned out of 222 permits issued. Dutch Harbor and Unalaska residents accounted for 210, or 95%, of all permits issued in the Unalaska District, and returned 165 permits out of 210 permits (79%) (Table 9-2).

5. Additional information about the federal subsistence fishery is available by contacting the United States Fish and Wildlife Service, Office of Subsistence Management in Anchorage, AK (http://www.doi.gov/subsistence/index.cfm).

The estimated subsistence harvest of salmon in the Unalaska District in 2015 was 4,459 fish, which was 120 salmon more than the previous year (4,339), but less than the recent 5-year average (5,165 fish), and less than the10-year average (4,530 fish) for the district (Table 9-1). The composition of the 2015 subsistence salmon harvest was sockeye (79%), coho (10%), pink (10%), Chinook (<1%), and chum (1%) (Figure 9-1). The primary subsistence salmon fishing locations used in the Unalaska District occurred primarily in Reese Bay where sockeye salmon are targeted as they are migrating to McLees Lake (Hartill and Keyse 2010).

In interviews with Division of Subsistence personnel in 2000, ADF&G fishery managers expressed the view that the permit program captured most subsistence salmon harvests occurring in the Unalaska District (Fall and Shanks 2000). In their view, most subsistence fishers likely obtained permits, perhaps due to the presence of Alaska Wildlife Troopers from the Alaska Department of Public Safety as well as a population that is self-enforcing (likely to report violators). Fishery managers in the Unalaska District believe that few commercially caught salmon are retained for home uses in the Aleutian Islands Area because most commercial fishing activities in the area target shellfish and groundfish rather than salmon. A 1994 survey of randomly selected Unalaska households conducted by the Division of Subsistence supports this view: it found that 4% of all salmon harvested for home uses were removed from commercial catches, 62% were harvested with noncommercial nets, and 34% with rod and reel under sport fishing regulations (CSIS).

SALMON HARVESTS IN THE ADAK DISTRICT

The Adak District of the Aleutian Islands Area consists of waters west of Atka Pass at 175°23.00′ west longitude to the terminus of the Aleutian Islands. Adak Island hosted a U.S. Navy base and military community (population of 4,633 in 1990) that was phased out between 1993 and 1996. With the Navy base closure complete, the population was estimated at 0 in 1997; however, for several years following the base closure, the Aleut Corporation worked with the Department of Interior and Department of the Navy to lease the base facilities and ultimately secure a land transfer to the corporation in 2004, with the intention of repurposing and privatizing the facility's infrastructure to support the local fisheries industry with processing, refueling, and housing services. During the lease period, the Aleut Corporation processed its first commercially caught fish in 1998 and has continued working with the Alaska seafood industry to further develop and maintain Adak as a commercial fish processing location. In 2000, the Alaska Boundary Commission approved Adak's application to become a second-class city. In 2013, Aleut Enterprises and the Aleut Corporation owned and operated a seafood processing facility, and a few Adak residents held commercial fishing permits. In addition, Adak provides a fueling port and crew transfer facility for foreign fishing fleets.[6,7] Adak's estimated population was 316 in 2000[8] and 331 in 2010, with 21 students attending the Adak school. The estimated population for Adak in 2015 was 326 of which 217 resided in group quarters. [9]

Salmon Harvest Regulations

Prior to 1988, the noncommercial salmon net fishery at Adak was classified as a subsistence fishery, then a personal use fishery in 1988, followed by a return to a subsistence classification in 1998.

6. Gen. Hansford T. Johnson, USAF. 2002. Statement of H.T. Johnson Assistant Secretary of the Navy (Installations and Environment) Before the Subcommittee on Public Lands and Forests of the Senate Committee on Energy and Natural Resources To Ratify an Agreement Between the Aleut Corporation And the United States of America. Washington, D.C. Accessed September 2014. http://www.navy.mil/navydata/people/assistsecnav/asn_ie/htjohnson020509.txt.
7. Adak Update: Adak Land Transfer Fact Sheet. 2004. Engineering Field Activity (EFA) Northwest, Naval Facilities Engineering Command. Accessed September 2014. http://www.navfac.navy.mil/content/dam/navfac/PDFs/factsheets/adak-alaska.pdf.
8. U.S. Census Bureau, Washington D.C. n.d. "American FactFinder." U.S. Department of Commerce. Accessed July 2017. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml
9. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage: 2010 census: demographic profiles." Accessed July 2017. http://live.laborstats.alaska.gov/cen/dparea.cfm

Subsistence regulations in place since 2001 require that fishers obtain a permit from ADF&G. Fishers must record their daily harvests on the permit, and return it to ADF&G by October 31. Permit holders may harvest up to 25 salmon per permit, plus an additional 25 salmon for each household member listed on the permit. Other standard permit conditions include prohibition of fishing within 300 ft of a dam, fish ladder, weir, culvert, or other artificial obstruction. Also, as specified in 5 AAC 01.380 (b)(2), "a permit holder may obtain an additional permit from the department to harvest more salmon." Salmon may be taken at any time. All salt waters within 100 yards of a stream terminus, as well as all fresh waters of and around Adak Island and Kagalaska Island, are closed to subsistence fishing for salmon (5 AAC 01.375 (6)).

Salmon Harvest Assessment Program

Subsistence salmon permits are issued by the ADF&G Cold Bay office and are faxed upon request to Adak residents. Permits must be returned by mail or fax to the ADF&G Cold Bay office by October 31, after which reminder letters are sent to those who have yet to report their harvests. ADF&G fishery managers believe that the program provides reliable data on subsistence salmon fishing effort and harvests at Adak (Fall and Shanks 2000).

Subsistence Salmon Harvests in 2015, Adak District

In 2015, 1 subsistence salmon permit was issued for the Adak District. This was more than the 0 issued in the previous year, but less than the 5-year (2) and 10-year (3), and the historical 1988–2014 averages (15) (Table 9-3). The total harvest was 11 sockeye salmon.

SALMON HARVESTS AT AKUTAN, NIKOLSKI, AND ATKA

Permits are not required for subsistence salmon harvests in the Akutan, Umnak, and Atka–Amlia islands districts, and there are no annual harvest assessment programs in place. In these districts, no more than 250 salmon may be taken annually for subsistence purposes (5 AAC 01.380).

The Division of Subsistence conducted postseason household interviews in Akutan (Akutan District) and Nikolski (Umnak District) pertaining to 1991 subsistence harvests (all resources); again in Akutan pertaining to 2008 subsistence harvests (all resources); and in Atka (Atka–Amlia Islands District) pertaining to harvests in 1992 (salmon only), and 1994 (all resources). Salmon harvest data were also collected for Akutan and Nikolski (2002 and 2003 harvests) and Atka (2003 harvests) as part of the project reported in Davis (2005). In most years, subsistence harvests of salmon in Akutan, Nikolski, and Atka are primarily composed of sockeye salmon, but coho and pink salmon also account for a relatively large proportion of yearly harvests (Table 9-5). Subsistence salmon harvests in Akutan totaled 3,268 fish in 1991, decreasing to 1,070 fish in 2002 and 1,675 fish in 2003. In 2008, Akutan harvests totaled nearly the same as in 1991 with a total of 3,363 salmon; with sockeye (1,489) and pink salmon (1,366) harvests being near equivalent. The Reedy-Maschner and Maschner (2012) report indicates an estimated salmon harvest for 2009 of 2,122 fish. Sockeye salmon harvests totaled an estimated 554 fish, a 63% decrease from 2008. Likewise, coho harvests in 2009 were 68% lower than in 2008 (150 salmon). Pink and chum salmon harvests in 2009 were similar to 2008 at 1,377 and 38 salmon, respectively. (Reedy-Maschner and Machner 2012). Yearly salmon harvests in Nikolski also presented an apparent decreasing pattern, with 1,902 fish caught in 1991 and 604 fish in 2003; further data collection and analysis is necessary to confirm the trend. In Atka, the yearly salmon harvest varied between 1,454 and 2,387 in the 3 years for which information is available (Table 9-5).

OTHER SUBSISTENCE FISHERIES IN THE ALEUTIAN ISLANDS AREA

Finfishes

Harvest estimates of subsistence halibut for the Aleutian Islands Area are available for 2014 (Fall and Lemons 2016). Due to funding constraints, estimates of subsistence halibut harvests for 2015 are not available.

There are no annual harvest assessment programs for other subsistence finfish fisheries of the Aleutian Islands Area. Permits are required for the taking of rainbow/steelhead trout and Arctic char/Dolly Varden, but no harvest reporting program is in place. Fish other than salmon may be taken by gear specified in 5 AAC 01.010, except that under state regulations, halibut may be taken only by a single handheld line with no more than 2 hooks attached, while federal rules allow up to 30 hooks using a longline (skate). The Division of Subsistence has conducted systematic household surveys pertaining to a single year's harvests in Akutan (1991; 2008), Atka (1994), Nikolski (1991), Saint George (1994), Saint Paul (1994), and Unalaska–Dutch Harbor (1994). Results, including harvest estimates for finfishes, are available in the CSIS.

Nonsalmon subsistence harvest data are also available for Akutan in 2009 (Reedy-Maschner and Maschner 2012). The per capita edible weight of nonsalmon fish reported for Akutan in this study was 131.7 lb. This harvest was composed primarily of Pacific halibut (105.1 lb per capita), followed by Pacific cod (19.4 lb per capita), and Dolly Varden (3.7 lb. per capita). For more information, refer to Reedy-Maschner and Maschner (2012).

Shellfish

Permits for the taking of shellfish for subsistence purposes are required only for king and Tanner crabs in that portion of the Alaska Peninsula–Aleutian Islands Area west of Scotch Cap Light and east of 168° west longitude. Subsistence harvests of king and Tanner crabs in 2015 are documented in Leon et al. (2017). Estimates of subsistence harvests of all marine invertebrates for single study years, based on systematic household surveys, are available in the CSIS.

Table 9-1.–Historical subsistence salmon harvests, Unalaska District, 1985–2015.

Year	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1985	65	22	0	897	208	20	1,293	2,418
1986	121	28	0	3,449	847	375	2,468	7,139
1987	81	49	0	1,097	378	151	1,780	3,406
1991	77	45	3	966	390	83	2,627	4,069
1989	74	42	2	1,112	470	36	1,292	2,912
1990	94	37	4	2,357	681	100	1,428	4,570
1991	89	48	0	1,294	666	45	1,075	3,080
1992	144	102	7	2,739	587	11	1,723	5,067
1993	139	102	17	2,831	697	136	587	4,268
1994	150	120	1	2,759	774	48	1,053	4,635
1995	160	129	23	4,484	484	23	791	5,805
1996	189	123	5	1,107	1,033	49	492	2,686
1997	221	163	8	4,192	864	110	554	5,728
1998	206	161	4	3,317	731	26	729	4,807
1999	208	154	0	2,485	1,234	16	1,044	4,779
2000	212	167	10	3,935	603	26	580	5,154
2001	204	165	6	4,202	724	77	784	5,793
2002	231	180	3	5,678	707	65	385	6,837
2003	227	179	25	5,124	572	40	378	6,139
2004	208	170	7	4,713	955	26	437	6,139
2005	217	152	8	4,066	424	14	527	5,038
2006	199	159	15	2,007	422	74	675	3,193
2007	178	126	14	2,575	254	42	683	3,569
2008	204	161	2	1,676	828	90	660	3,257
2009	210	130	5	3,171	616	182	443	4,416
2010	216	170	1	3,883	319	71	336	4,611
2011	230	156	8	5,525	303	65	343	6,244
2012	211	169	20	4,960	429	43	338	5,790
2013	254	197	3	4,281	199	67	290	4,840
2014	249	173	3	3,473	486	14	363	4,339
2015	222	172	6	3,524	442	26	460	4,459
5-year average (2010–2014)	232	173	7	4,424	347	52	334	5,165
10-year average (2005–2014)	217	159	8	3,562	428	66	466	4,530
Historical average (1985–2014)	176	126	7	3,145	596	71	872	4,691

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 9-2.–Estimated subsistence salmon harvests by community of residence, Unalaska District, 2015.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Akhiok	1	0	0	0	0	0	0	0
Akutan	1	1	0	0	0	0	0	0
Anchorage	3	1	0	0	0	0	0	0
Chugiak	2	1	2	146	0	0	0	148
Delta Junction	1	1	0	0	0	0	0	0
Dutch Harbor	102	79	0	1,622	83	0	121	1,826
Palmer	1	1	0	20	0	0	0	20
Sitka	1	1	0	0	0	0	0	0
Unalaska	108	86	4	1,687	359	26	339	2,415
Wasilla	1	0	0	0	0	0	0	0
Wrangell	1	1	0	50	0	0	0	50
Total	**222**	**172**	**6**	**3,524**	**442**	**26**	**460**	**4,459**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 9-3.–Historical subsistence and personal use salmon harvests, Adak District, 1988–2015.

	Permits		Estimated salmon harvest					
Year[a]	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1988	43	29	0	503	23	0	150	676
1989	64	47	0	382	0	0	117	499
1990	61	29	0	800	47	0	41	888
1991	37	31	0	281	6	0	34	321
1992	52	41	0	572	30	0	4	606
1993	36	26	0	638	12	0	26	676
1994[b]	0	0	0	0	0	0	0	0
1995	4	3	0	156	0	0	0	156
1996	6	6	0	91	0	0	0	91
1997[c]	18	12	0	229	0	4	0	233
1998	13	10	0	399	0	0	25	424
1999	5	5	0	164	4	0	0	168
2000	13	13	0	270	4	0	75	349
2001	17	15	14	489	18	0	16	537
2002	3	3	0	150	0	0	0	150
2003	6	5	0	338	0	0	0	338
2004	6	4	0	336	0	0	0	336
2005	2	2	0	188	0	0	0	188
2006	1	1	0	74	0	0	1	75
2007	9	8	0	367	2	0	29	398
2008	10	8	0	386	0	0	14	400
2009	1	1	0	25	0	0	0	25
2010	2	1	0	50	0	0	0	50
2011	0	0	0	0	0	0	0	0
2012	2	2	0	25	0	0	0	25
2013	6	3	0	30	12	0	80	122
2014	0	0	0	0	0	0	0	0
2015	1	1	0	11	0	0	0	11
5-year average (2010–2014)	2	1	0	21	2	0	16	39
10-year average (2005–2014)	3	3	0	115	1	0	12	128
Historical average (1988–2014)	15	11	1	257	6	0	23	286

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. Personal use fishery 1988 to 1997; subsistence fishery 1998 to present.

b. Navy presence at Adak was reduced beginning in 1994; no requests for permits that year.

c. In 1997, a number of civilians were hired to work on a clean-up effort at Adak.

Table 9-4.–Estimated subsistence salmon harvests by community of residence, Adak District, 2014.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Adak	1	1	0	11	0	0	0	11
Total	**1**	**1**	**0**	**11**	**0**	**0**	**0**	**11**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 9-5.–Estimated noncommercial harvests of salmon by residents of Akutan, Atka, and Nikolski.

		Estimated number of harvesting	Estimated salmon harvest[a]						
Community	Year	households	Chinook	Sockeye	Coho	Chum	Pink	Other–unknown	Total
Akutan	1991	24	10	1,872	429	36	915	6	3,268
Akutan	2002	NA	0	809	147	44	70	0	1,070
Akutan	2003	NA	3	1,270	127	0	275	0	1,675
Akutan	2008	21	2	1,489	452	54	1,366	0	3,363
Akutan	2009	40	2	554	150	38	1,377	0	2,122
Atka	1992	18	4	502	465	24	459	0	1,454
Atka	1994	23	10	394	583	133	1,267	0	2,387
Atka	2003	NA	8	1,187	333	0	264	0	1,792
Nikolski	1991	12	0	957	547	54	327	17	1,902
Nikolski	2002	NA	0	312	643	0	182	0	1,137
Nikolski	2003	NA	12	287	270	0	35	0	604

Sources ADF&G Division of Subsistence household surveys, (ADF&G 2009), Davis (2005).

Note NA indicates the estimated number of harvesting households cannot be calculated using available data.

a. Includes harvests for home uses by all methods, including subsistence nets, sport rod and reel, and removal from commercial harvests.

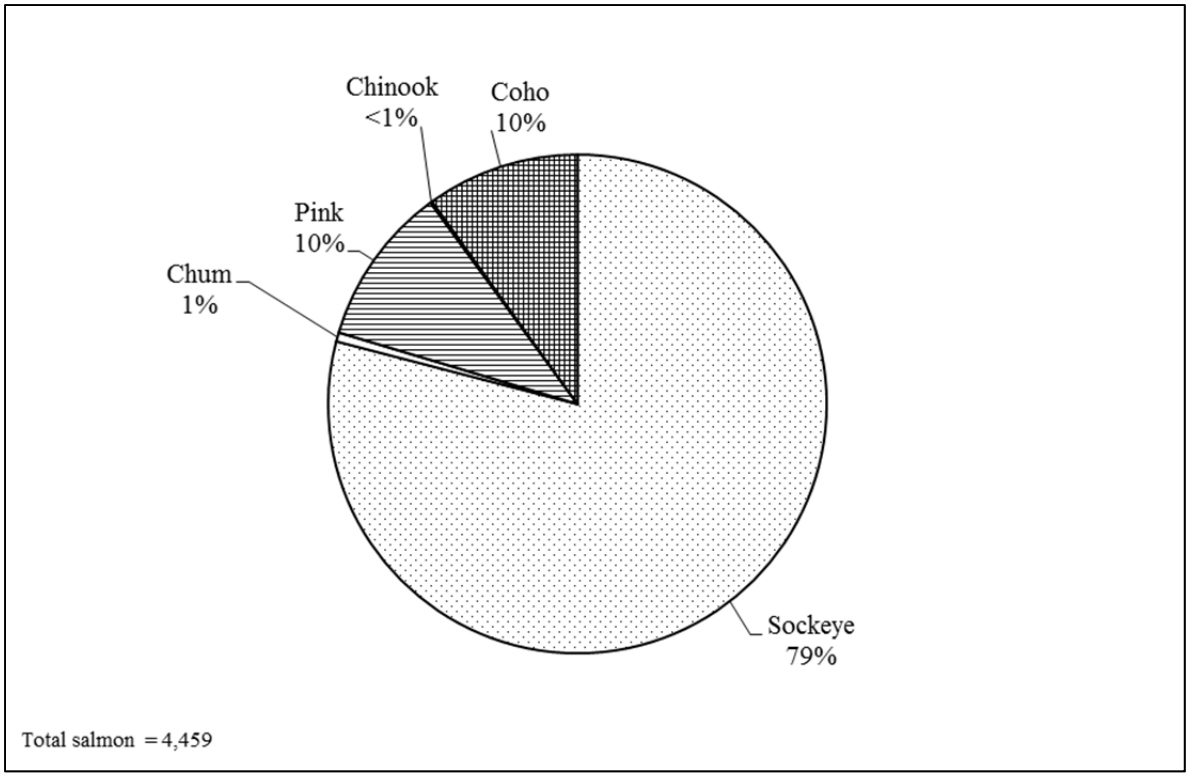

Figure 9-1.–Composition of Unalaska District estimated subsistence salmon harvest by species, 2015.

CHAPTER 10: KODIAK AREA

INTRODUCTION

The Kodiak Management Area (KMA or Kodiak Area) encompasses the waters of the Gulf of Alaska surrounding the Kodiak Archipelago and those waters along that portion of the Alaska Peninsula that drains into Shelikof Strait (Figure 10-1). The portion of the Kodiak Island Borough's population living along the island's road system is the largest rural community in Alaska (as defined by the Federal Subsistence Board [FSB]) and the largest community outside the nonsubsistence areas defined by the Alaska Joint Board (Figure 10-1). The population of the Kodiak Island Borough according to the State of Alaska Department of Labor and Workforce Development (13,790 in 2015) comprises all individuals residing on Kodiak and nearby islands; however, this population is often distinguished by which communities have access to the road system. Communities along the Kodiak Island road system include Kodiak City (6,262), the Kodiak Station (U.S. Coast Guard base) (1,309), Womens Bay (767), Chiniak (49), and the remainder of the road-accessible Kodiak Island Borough (this includes all residents of Kodiak Island who are on the road system but are not identified within the population of a census designated place [CDP] or city) (4,590). For the purposes of this report we include Chiniak as part of the Kodiak Road system because a road links it with Kodiak City, though must be noted that Chiniak uses its own postal code. Communities within the Kodiak Island Borough that are located off the road system include Akhiok (90), Aleneva CDP (23), Karluk (38), Larsen Bay (82), Old Harbor (229), Ouzinkie (174), and Port Lions (177).[1]

SALMON HARVEST IN THE KODIAK AREA

Salmon Harvest Regulations

Permits have been required to harvest salmon for subsistence purposes in the Kodiak Area since 1962. Since 1990, all Alaska state residents have been eligible to participate in subsistence salmon fishing in the Kodiak Area under state regulations. In 2015, legal gear for subsistence salmon fishing under state regulations included gillnets (maximum length 50 fathoms) and seines. Fishers are required to physically attend their net while fishing and should always have a valid subsistence salmon permit with them while fishing for salmon; they should also record the numbers of all fish harvested on the permit before concealing the fish from plain view or transporting them from the harvest area. Generally, fishing is open year-round from 6:00 AM to 9:00 PM daily. However, from June 1 to September 15, salmon seine vessels cannot be used for subsistence salmon fishing 24 hours before, during, and 24 hours after any period open for commercial salmon fishing. Between the same dates, gillnets are the only allowable gear that can be operated for subsistence purposes from purse seine vessels and no other salmon fishing gear may be on board.

In the fresh waters of Kodiak Island, east of the line from Crag Point south to the westernmost point of Saltery Cove, including the waters of Woody and Long Islands, and the salt waters bordering this area within a mile of Kodiak Island, excluding the waters bordering Spruce Island, 25 salmon may be taken by the permit holder annually plus an additional 25 salmon for each member of the same household whose names are listed on the permit. An additional permit maybe obtained if the fisher can demonstrate that additional fish are needed. In the remainder of the Kodiak area, there is no annual harvest limit. With few restrictions; the entire Kodiak Area is generally open to subsistence salmon fishing. The freshwater systems of Afognak Island, Little Afognak River and Portage Creek drainage in Discovery Bay are closed to subsistence fishing by regulation because they are easily accessible and at risk of overexploitation. (Anderson et al. 2016). If the department projects that the biological escapement goal for king salmon in

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed November 8, 2017. http://live.laborstats.alaska.gov/pop/index.cfm.

the Karluk River will not be met, regulations allow for the department to restrict, by emergency order, the retention of king salmon in the subsistence or sport fisheries in the Karluk watershed (5 AAC 01.548). A list of all waters closed to subsistence salmon fishing within the Kodiak Area under state regulations appears in 5 AAC 01.525.

In years when salmon runs to a particular system are weak and the department projects that biological escapement goals in a particular river drainage may not be met, the department may issue an emergency order to close subsistence fishing in the affected river drainage. If there is an over-escapement of salmon in years when runs are abundant, subsistence fishing opportunities might be increased. In 2015, the Chinook salmon run to the Ayakulik and Karluk rivers were both weak and the department issued an emergency order that closed subsistence fishing on June 17 and 19 in the Karluk River drainage, including Karluk Lagoon and the Ayakulik River drainage, to conserve fish for spawning escapement. Declining escapement levels of sockeye salmon to Afognak Lake have been a concern since the early 2000s, and have led to various emergency closures and restrictions on subsistence, sport, and commercial fisheries in the Afognak (Litnik) Lake drainage. In 2015, the Afognak Lake sockeye salmon run was strong, and on June 14th the normally closed waters were reduced to allow for more effective subsistence and commercial harvests (Anderson et al. 2016).

In 2015, federal regulations governing subsistence salmon fishing by eligible rural residents of the Kodiak Island Borough in federally managed public waters of the Kodiak Area were generally identical to the state regulations summarized above, except that rod and reel (in addition to gillnets and seines) was legal subsistence gear under federal rules. Another difference was that federal regulations allowed subsistence salmon fishing 24 hours a day, while state regulations limited subsistence fishing to the hours of 6:00 AM to 9:00 PM daily. A list of federal public waters closed to subsistence salmon fishing in the Kodiak area is available in the 2013–2015 Subsistence Management and Regulations for the harvest of fish and shellfish on Federal Public Lands and Waters in Alaska published by the Federal Subsistence Management Program.[2]

According to Cinda Childers, Refuge Clerk in the Kodiak National Wildlife Refuge (KNWR), refuge staff have issued a separate subsistence salmon fishing permit for federally-qualified residents of the Kodiak Island Borough from the KNWR office in Kodiak since approximately 2010. Records received from the Refuge office indicate that in 2015, a total of 19 permits were issued, an increase of 1 permit from 2014. The total 2015 reported harvest with gillnets was 63 with 53 sockeye salmon and 9 coho. In addition there was 1 coho harvested by rod and reel. Reported sockeye harvests in 2015 indicated a noticeable decrease from the harvest of 139 sockeye salmon harvested in 2014, but an increase of 9 coho in 2015[3] (Table 10-1).

Salmon Harvest Assessment Program

ADF&G staff in the Division of Commercial Fisheries' Kodiak office manages the annual subsistence salmon harvest assessment program for the Kodiak Area. A permit is required for taking of salmon for subsistence purposes in the Kodiak Area (5 AAC 01.530(a)). Permits are available to only Alaska residents. New subsistence salmon harvest permits may be requested in person, phone, or by mail at the ADF&G Kodiak office. For individuals that were issued a permit in the previous year, a new permit is automatically mailed to them, providing they had returned their permit from the previous with their harvest recorded. All permit holders are required to record their harvest on the permit, listing areas fished by date and salmon harvested by species, and return the permit, regardless of whether they fished, no later than February 1 of the year following when the permit was issued (5 AAC 01.53(c)). Permits may be

2. U.S. Fish and Wildlife Service. n.d. [2013], "Subsistence Management Regulations for the Harvest of Fish and Shellfish on Federal Public Lands and Waters in Alaska, April 1, 2013–March 31, 2015." Federal Subsistence Board, Office of Subsistence Management, Accessed September 12, 2016. http://www.doi.gov/subsistence/regulation/fish_shell/upload/entireFishRegbook.pdf.
3. Lisa Hutchinson-Scarbrough, Division of Subsistence, Subsistence Resource Specialist, personal communication with Cinda Childers, October 6, 2017.

returned in person or via mail, email, fax or phone to the Kodiak ADF&G office. ADF&G sends reminder postcards in February to permit holders who have not returned their permits (Anderson et al. 2016).

Over the years, a consistent challenge for the Division of Commercial Fisheries' salmon harvest assessment program has been the large number of permits that annually are returned to ADF&G by the U.S. Postal Service marked as "undeliverable." No record is maintained regarding the number of "undeliverable" permits—as a result, the actual number of permits issued per year is unknown. Therefore, harvest reports have not been expanded for this area since 1999 (Table 10-2). Results of the harvest monitoring program therefore reflect only the reported harvests of subsistence fishers who returned permits. Furthermore, the permit harvest assessment program does not collect noncommercial salmon harvests with rod and reel gear, which is legal subsistence gear under federal subsistence regulations but not under state regulations. Annual rod and reel harvest completed under state sport fishing regulations are tracked through a statewide mail-out survey of a random sample of sport fish license holders, managed by the Division of Sport Fish. Another challenge for the Kodiak area fishery managers is the number of salmon removed from commercial harvests for personal use, which is also not documented on the subsistence salmon harvest permit.

Commercial fishermen, both residents and non-residents may retain legally harvested salmon for their own use including personal consumption or for bait but must not be sold (AAC39.010b) and must be reported on an ADF&G fish ticket at the time of landing (5 AAC 18.355(b). More information on the harvest and use of personal use and sport caught salmon is needed for a better understanding of the household salmon harvest in the Kodiak Area.

To assist in the assessment of the subsistence salmon harvest, use, and dependence of Kodiak Island Borough residents on these resources, ADF&G Division of Subsistence has been collecting subsistence harvest data on Kodiak Island communities periodically (see for example Fall 2006; Fall and Utermohle 1995, 1999; Williams et al. 2010). The data collection instrument used for over 20 years to collect these data is a systematic, in-person household harvest survey. The results of these surveys are reported in the Community Subsistence Information System (CSIS), a depository of Alaska subsistence information maintained by the Division of Subsistence. In early 2001, interviews were conducted with Division of Subsistence staff and fishery managers within the Division of Commercial Fisheries. During interviews, fishery managers expressed uncertainty regarding the accuracy of subsistence salmon harvest data collected through the Kodiak Area permit program. ADF&G staff suspected that a substantial amount of subsistence harvests occurred without permits, especially in areas off the Kodiak Island road system. In June 2001, staff from the Division of Commercial Fisheries and the Division of Subsistence visited 6 communities off the road system in the Kodiak Island Borough (Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions) to implement an area permit vendor program. A resident in each community was trained to issue subsistence fishing permits. Outreach activities were conducted in each community to encourage subsistence fishers to obtain permits, record their harvests, and return the permits at the end of the season. A review of the annual permit program by the Division of Subsistence in Kodiak Island communities during 2004–2006 concluded that unreturned or lost permits had contributed to the underestimation of the annual subsistence salmon harvest and that communication between fisheries managers and community residents about the importance of an accurate annual harvest estimate should be improved (Williams et al. 2010). Recent research conducted in Kodiak City, Larsen Bay, and Old Harbor between 2012 and 2014 by Division of Subsistence researchers showed that outreach in regard to subsistence fishing regulations and permitting is again needed in Kodiak Island communities (Marchioni et al. 2016). During the project, researchers witnessed a great deal of confusion surrounding subsistence regulations and the permit system, and area managers were contacted so researchers could provide accurate answers to subsistence fishers' questions. The final report for the study also called for a revision of the language on the subsistence salmon permit to better reflect the actual language in the regulation book, which states that additional permits are available upon request (Marchioni et al. 2016:41). A similar recommendation was previously made by Williams et al. in their report (Williams et al. 2010).

Subsistence Salmon Harvests in 2015

In 2015, a total of 1,544 subsistence permits with harvest information were returned to ADF&G (tables 10-1 and 10-2). Of these, 1,274 (83%) were returned by residents of the Kodiak Island Borough, 267 (or 17%) were returned by residents of other Alaska communities, and 3 (<1%) had been issued to Alaska residents who were serving in the military outside of the state (Table 10-3).

The total reported subsistence salmon harvest for the Kodiak Area in 2015 was 20,735 fish, which is significantly lower (32%) than the recent 5-year (2009–2013) average of 30,605 salmon, and 33% lower than the 10-year (2005–2014) average of 30,864 salmon (Table 10-2). Of the total harvest, 19,480 salmon (or 94%) were harvested by residents of Kodiak Island Borough communities. This was a decline of 25% from the 25,995 salmon reported harvested in these communities in 2014. Also in 2015, 1,255 salmon (or 6%) were harvested by permit holders in other Alaska communities (Table 10-3). Of the 20,735 salmon harvested in the Kodiak Area in 2015, 15,194 fish (or 73%) were taken by residents living along the Kodiak Island road system (Figure 10-2). The Kodiak Island road system includes Chiniak, Kodiak City, the U.S. Coast Guard base, Womens Bay, and the remaining residents who live along the Kodiak Island road system but who are not identified within the population of a CDP or city. In comparison, the 6 villages and other populated remote locations that do not have access to the road system surrounding Kodiak City, harvested 4,286 salmon (21%) in 2015 (Table 10-3, Table 10-4).

In 2015, the Kodiak Area subsistence salmon harvest was composed of 16,053 (77%) sockeye salmon, 3,057 (15%) coho salmon, 1,168 (6%) pink salmon, 271 (1%) chum salmon, and 186 (1%) Chinook salmon (Figure 10-3; Table 10-2)). The reported sockeye salmon harvests of 16,053 fish in 2015 was 29% less than the previous year's reported sockeye harvest of 22,617 fish and 38% less than the recent 5 year (2010–2014) average of 26,089 sockeye. The coho salmon harvest of 3,057 fish in 2015 was 22% less than in 2014 reported harvest of 3,915 fish; yet near equivalent to recent 5-year (2010–2014) average of 3,186 fish. The chum salmon reported harvest in 2015 of 271 fish was 36% higher than the recent 5 year average of 199 fish but near equivalent to the recent 10-year average of 262 fish. The pink salmon reported harvest in 2015 of 1,168 fish was significantly higher (104%) than the 2014 harvest of 573 fish, but near equivalent to the recent 5-year average of 1,004 fish and as well as the 10-year average of 1,303 fish. Chinook salmon reported harvests in 2015 totaled 186 fish which was about the same as the year prior of 183 fish as well as the recent 10-year (2005–2014) average of 186 fish, but 46% higher than the recent 5-year (2010–2014) average of 127 fish; and 21% less than the historical average harvests of 236 Chinook salmon (Table 10-2).

According to Jackson and Keyse (2013), the long-term, primary harvest areas for Kodiak area subsistence salmon fisheries are the Buskin and Pasagshak rivers located in the north end of Kodiak Island and the southeast side of Afognak Island at Litnik. Additional harvest areas documented during the recent research by the Division of Subsistence researchers are presented in Marchioni et al. (2016).

As discussed earlier, the subsistence salmon harvest estimates for the Kodiak Area based on household harvest surveys and reported in the CSIS have often been substantially higher than harvests reported through permit returns. Delivery of permits to subsistence fishers living in communities outside of the road system, including Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions, has proven problematic in the past and continues to be a challenge. As mentioned above, an outreach effort and an area permit vendor program were implemented in 2001 to address this issue. These actions appeared to result in increased participation in the permit program in these 6 communities. A total of 100 permits were returned in 2000; from 2001 through 2007 between 189 and 143 permits were returned (Table 10-4). Accordingly, the yearly reported subsistence salmon harvest fluctuated between 2000 and 2007. Since 2008, the number of returned permits from these communities has not exceeded 125. In fact, the most recent years of 2012–2015 have marked the lowest reported salmon harvests recorded since 2000 (Table 10-4). In 2015, both the number of permits returned by the 6 villages (95 permits) and the number of harvested salmon reported (4,286 fish) were the closest to data for 2000, which was prior to the

implementation of the local permit vendor program and the outreach effort (Table 10-4). In 2015, a limited local vendor program with the Tribal Councils was in place in Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions (personal communication with Amanda Dorner, Division of Commercial Fisheries, Kodiak office, October 12, 2017). Other than the work conducted by Division of Subsistence researchers and project partners during an ethnographic study in 2012–2013 of subsistence salmon harvests and uses in Kodiak City, Larsen Bay, and Old Harbor presented in Marchioni et al. (2016), no additional outreach efforts have occurred in the small communities on Kodiak Island since 2014.

Retention of Salmon Taken in Commercial Fisheries in 2015

In 2015, 70 commercial fishermen in the Kodiak Management Area (Kodiak Area) reported on their fish tickets that they retained for personal or home use a total of 9,823 salmon from their commercial harvests. This included 293 Chinook salmon, 3,231 sockeye salmon, 1,551 coho salmon, 4,008 pink salmon, and 740 chum salmon (Table 10-5); (Anderson et al. 2016). In terms of the composition of the harvest, the 2015 commercial harvest retained for home use was somewhat different than that reported harvested in the subsistence fishery. As shown in Figure 10-4 and Table 10-5, of the 9,823 reported total salmon retained for home use, the majority were pink salmon (41%) followed by sockeye salmon (33%), coho salmon (16%), chum salmon (7%), and Chinook salmon (3%.

Compared to 2014, the total number of salmon removed from commercial harvest for home use (8,843 fish) was 11% greater in 2015 and 29% greater than the 10-year (2005–2014) average of 7,616 fish removed. The most noticeable difference of the amount of salmon by species retained for home use in 2015 was the increase of coho and Chinook from the previous year (2014) as well as the 10-year (2005–2014) averages. Chum salmon increased by 4011% from 2014 and 448% from the 10-year average, and Chinook salmon retained increased by 55% from 2014 and 91% from 10-year average. (Table 10-5);

OTHER SUBSISTENCE FISHERIES IN THE KODIAK AREA

Finfishes

In the Kodiak Area, in addition to salmon, a subsistence permit is required for taking or attempting to take subsistence herring, trout, char, crab or shrimp (5 AAC 01.530). Permits for all required species are issued through the Kodiak ADF&G office. There is one subsistence permit issued for the Kodiak Area that allows for a person to fish for salmon, herring, trout, char, crab, and shrimp. Each person issued a permit must accurately record information requested on the permit. The permit has space for a person to record harvests of salmon, herring, and crab, but reporting of trout, char or shrimp is not required. In 2015, there were a total of 1,798 subsistence permits issued, of which 13 or 0.72% reported herring harvests with a combined reported total of 1,515 pounds. 2015 had the lowest reported estimate for subsistence herring since 2003, and was 30% lower than the previous reported harvest of 2,164 pounds and 59% less than the 10-year (2005–2014) average of 3,672 pounds of herring harvested for subsistence[4].

Fish other than those listed above may be taken at any time for subsistence purposes without a permit; however there are bag limits and gear restrictions for the taking of halibut, lingcod, and rockfish in the Kodiak Area under state regulations (5 AAC 01.520; 5 AAC 01.545). Halibut may also be taken for subsistence by qualified residents by obtaining a federal subsistence halibut registration certificate. Subsistence harvest data are currently available for communities and tribes in the Kodiak Area from 2003–2012 (Fall and Koster 2014) and 2014 (Fall and Lemons 2016). Due to a lapse in funding, since 2012 Pacific halibut subsistence harvest estimates are only collected biannually.

There are no annual harvest assessment programs for other subsistence finfish fisheries in the Kodiak Area that are legal for subsistence but do not require a permit. Harvest estimates based on comprehensive

4. Personal communication with Amanda Dorner, Division of Commercial Fisheries, Kodiak office, October 12, 2017.

household surveys conducted by the Division of Subsistence are available in the CSIS for freshwater and marine species spanning multiple years for each Kodiak Island Borough community. Fish harvested in the largest quantities and used by the majority of households include Pacific cod, lingcod *Ophiodon elongatus*, various species of flounders, Pacific halibut, rockfishes, and Arctic char/Dolly Varden.

Shellfish

Subsistence permits are required for the harvest of king, Tanner, and Dungeness crabs and shrimp in the Kodiak Area (5 AAC 02.405; 5 AAC 02.410). As mentioned above harvesters only need one permit for harvesting salmon, herring, and shellfish; the shellfish harvest is recorded on the back of the salmon permit, but the permit only has space to record harvests for crab, not shrimp. Regulations establish sex, size, and bag and possession limits for all species of crabs. Only male crabs may be taken. Other marine invertebrates used for subsistence purposes in the Kodiak Area include clams, cockles, mussels, chitons, octopuses, sea urchins, and more, but a subsistence permit is not needed to harvest these species. In 2015, 204 Kodiak area subsistence permits reported harvesting crab, with a combined total of 4,118 crab harvested of which were 215 king crab, 3,367 Tanner crab, and 536 Dungeness crab. 2015 crab harvests were 20% less than the total crab reported harvested from the previous year (5,138 crab) and 51% lower than the 10-year (2004–2014) average of 8,430 crab reported harvested. There has been a decline historically of permits returned noting crab harvests, with 204 permits in 2015, 227 permits in 2014, and 326 permits 10-year (2004–2014) average.[5]

5. Personal communication with Amanda Dorner, Division of Commercial Fisheries, Kodiak office, October 12, 2017.

Table 10-1.–Federal subsistence salmon harvests by community and species, Kodiak Area, 2015.

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Kodiak (city)	19	19	0	53	10	0	0	63
Total	**19**	**19**	**0**	**53**	**10**	**0**	**0**	**63**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 10-2.–Historical subsistence salmon harvests, Kodiak Area, 1986–2015.

Year	Permits Issued	Returned	Reported salmon harvest[a] Chinook	Sockeye	Coho	Chum	Pink	Total
1986	1,244	1,002	90	14,391	6,998	605	2,371	24,455
1987	1,124	880	101	13,198	6,463	1,299	2,421	23,482
1988	1,098	699	108	10,081	4,291	377	1,320	16,177
1989	2,800	717	43	12,638	4,123	419	1,553	18,776
1990	2,900	1,167	131	17,959	8,627	655	1,605	28,977
1991	1,406	1,225	177	21,835	8,208	714	1,743	32,677
1992	1,561	1,195	318	20,684	8,643	643	1,646	31,934
1993	1,496	959	243	19,471	7,176	838	2,696	30,424
1994	2,550	1,464	205	17,962	7,491	440	1,758	27,856
1995	1,950	1,194	175	19,416	5,603	293	1,548	27,035
1996	1,567	1,390	253	28,287	5,117	381	1,125	35,163
1997	2,098	1,638	383	33,293	6,369	234	1,458	41,737
1998	1,841	1,126	350	20,459	5,348	214	1,412	27,783
1999	ND	1,438	397	26,497	4,932	388	1,266	33,480
2000	ND	1,376	273	24,873	5,399	341	742	31,628
2001	ND	2,153	273	33,833	5,920	427	1,158	41,611
2002	ND	2,271	593	32,977	6,057	350	1,665	41,642
2003	ND	2,275	500	32,104	6,096	384	1,484	40,568
2004	ND	2,240	379	30,217	5,819	261	1,395	38,071
2005	ND	1,900	431	27,002	7,447	592	2,343	37,815
2006	ND	1,906	280	22,905	6,640	441	1,827	32,093
2007	ND	2,118	207	24,556	4,630	240	1,532	31,165
2008	ND	1,637	151	20,809	4,336	168	1,128	26,592
2009	ND	1,737	159	21,852	4,570	186	1,180	27,947
2010	ND	1,890	158	22,170	4,200	273	1,266	28,067
2011	ND	1,996	122	34,037	2,367	198	1,199	37,923
2012	ND	1,866	54	23,865	2,920	166	1,154	28,159
2013	ND	1,688	119	27,757	2,528	175	826	31,405
2014	ND	1,666	183	22,617	3,915	184	573	27,472
2015	ND	1,544	186	16,053	3,057	271	1,168	20,735
5-year average (2010–2014)	ND	1,821	127	26,089	3,186	199	1,004	30,605
10-year average (2005–2014)	ND	1,840	186	24,757	4,355	262	1,303	30,864
Historical average (1986–2014)	ND	1,545	236	23,371	5,594	410	1,496	31,107

Source ADF&G Division of Subsistence, ASFDB 2015 (ADF&G 2016).

ADF&G sends permits to every permit holder who returned a permit in the previous year. The U.S. Postal Service returns a number of permits to ADF&G marked "undeliverable." No record is maintained regarding the number of "undeliverable" permits. As a result the actual number of permits issued remains unknown (ND). For this reason, harvest reports have not been expanded.

Table 10-3.–Reported subsistence salmon harvests by community and species, Kodiak Area, 2015.

Community	Permits returned	Reported salmon harvest[a]					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Kodiak Island Borough							
Akhiok	3	0	138	13	0	33	184
Chiniak	22	13	227	50	9	23	322
Karluk	0	0	0	0	0	0	0
Kodiak (city)	1,157	141	11,570	2,048	179	934	14,872
Larsen Bay	18	14	560	16	14	6	610
Old Harbor	18	2	461	367	13	58	901
Ouzinkie	29	10	1,016	327	43	54	1,450
Port Lions	27	1	932	175	0	33	1,141
Subtotal, Kodiak Island Borough	**1,274**	**181**	**14,904**	**2,996**	**258**	**1,141**	**19,480**
Other Alaska							
Anchor Point	6	0	0	0	0	0	0
Anchorage	97	3	586	18	8	15	630
Bethel	0	0	0	0	0	0	0
Bettles	1	0	0	0	0	0	0
Cantwell	1	0	0	0	0	0	0
Central	2	0	0	0	0	0	0
Chickaloon	1	0	0	0	0	0	0
Chugiak	4	0	37	0	0	0	37
Clam Gulch	0	0	0	0	0	0	0
Cold Bay	2	0	47	0	0	0	47
Cooper Landing	1	0	0	0	0	0	0
Cordova	2	0	0	1	0	0	1
Craig	0	0	0	0	0	0	0
Eagle River	19	1	64	5	0	0	70
Eielson AFB	1	0	0	0	0	0	0
Fairbanks	9	0	16	0	2	6	24
Fort Wainwright	1	0	0	0	0	0	0
Girdwood	5	0	0	0	0	0	0
Homer	24	0	159	16	3	2	180
Juneau	4	1	54	0	0	0	55
Kasilof	5	0	0	0	0	0	0
Kenai	4	0	25	0	0	0	25
Metlakatla	0	0	0	0	0	0	0
Nikiski	3	0	0	0	0	0	0
Ninilchik	3	0	0	0	0	0	0
North Pole	3	0	0	0	0	0	0
Palmer	12	0	0	0	0	0	0
Seldovia	2	0	0	0	0	0	0
Seward	4	0	0	0	0	0	0
Shishmaref	1	0	0	21	0	0	21
Sitka	2	0	0	0	0	0	0
Soldotna	18	0	43	0	0	1	44
Sterling	1	0	0	0	0	0	0

-continued-

Table 10-3.–Page 2 of 2.

Sutton	1	0	0	0	0	0	0
Talkeetna	3	0	0	0	0	0	0
Thorne Bay	1	0	0	0	0	0	0
Tok	1	0	0	0	0	0	0
Valdez	2	0	0	0	0	0	0
Wasilla	21	0	118	0	0	3	121
Willow	0	0	0	0	0	0	0
Subtotal, other Alaska	**267**	**5**	**1,149**	**61**	**13**	**27**	**1,255**
Other USA[b]	3	0	0	0	0	0	0
Total	**1,544**	**186**	**16,053**	**3,057**	**271**	**1,168**	**20,735**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. ADF&G sends permits to every permit holder who returned a permit in the previous year. The U.S. Postal Service returns a number of permits to ADF&G marked “undeliverable.”No record is maintained regarding the number of "undeliverable" permits. As a result the actual number of permits issued remains unknown (ND). For this reason, harvest reports have not been expanded.

b. These are Alaska residents serving in the military who had a mailing address outside the state.

Table 10-4.–Permits returned and salmon harvests reported by the villages of Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions.

Year	Permits returned	Reported salmon harvest	Source
2000[a]	100	6,299	(Fall et al. 2002:105)
2001	189	9,034	(Fall et al. 2003a:117)
2002	167	9,386	(Fall et al. 2003b:121)
2003	165	8,714	(Brown et al. 2005b:123)
2004	170	7,845	(Fall et al. 2007a:118)
2005	147	10,172	(Fall et al. 2007b:105)
2006	143	7,114	(Fall et al. 2009a:113)
2007	143	5,138	(Fall et al. 2009b:105)
2008	117	5,850	Fall et al. 2011:111
2009	118	5,824	Fall et al. 2012:119
2010	118	5,896	Table 10-3
2011	125	5,786	Table 10-3
2012	112	4,939	Table 10-3
2013	98	4,798	Table 10-3
2014	106	4,690	Table 10-3
2015	95	4,286	Table 10-3

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. Local permit vendor program and outreach efforts implemented in 2000.

Table 10-5.–Retention of salmon taken in commercial salmon fisheries but not sold, by species, for the Kodiak Management Area, 1997–2015.

			Number of salmon					
Year	Permits	Landings	Chinook	Sockeye	Coho	Pink	Chum	Total
1997	10	10	7	678	91	2	6	784
1998	4	5	8	26	9	0	0	43
1999[b]								
2000[b]								
2001	9	14	16	465	1,215	33	0	1,729
2002	33	56	57	5,447	7,542	0	566	13,612
2003[c]	36	87	72	11,025	12,310	86	1,492	24,985
2004	13	39	8	3,052	290	10	253	3,613
2005	16	37	54	4,432	811	11	4,385	9,693
2006	31	52	100	1,442	2,786	128	1,140	5,596
2007	13	25	26	1,577	520	8	2,246	4,377
2008	19	40	76	2,513	681	0	0	3,270
2009	23	38	49	1,393	936	6	1,002	3,386
2010	42	75	160	2,330	2,976	15	6,267	11,748
2011	57	117	161	1,314	2,009	67	6,390	9,941
2012	57	137	195	4,116	1,971	31	1,413	7,726
2013	64	152	592	3,032	1,164	1,067	5,721	11,576
2014	77	159	189	3,371	2,230	18	3,035	8,843
2015	70	155	293	3,231	1,551	740	4,008	9,823
5-year average (2010–2014)	59	128	259	2,833	2,070	240	4,565	9,967
10-year average (2005–2014)	40	83	160	2,552	1,608	135	3,160	7,616
Historical average (1997–2014)	32	65	111	2,888	2,346	93	2,120	7,558

Source: Anderson et al. 2016

a. This is the number of salmon taken by CFEC permit holders with commercial gear during commercial fishing periods that was not sold but instead was kept for the crew's own use. Prior to 1997 this data was not recorded on ADF&G fish tickets.

b. Confidential data.

c. In 2003, there was concern that salmon taken as home pack were being custom-processed for later sale for consumptive use. In response, the Alaska Board of Fisheries adopted a regulation clearly stating that these fish were not to be sold or bartered (5 AAC 39.010).

Figure 10-1.–Kodiak Area map.

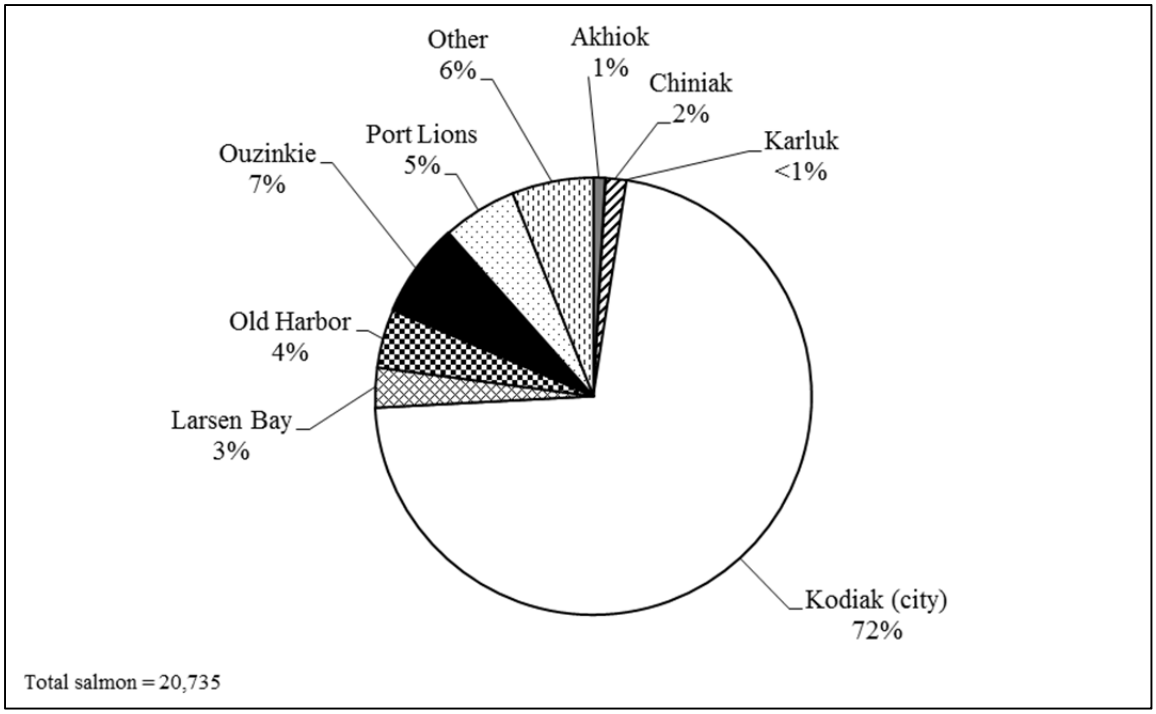

Figure 10-2.–Subsistence salmon harvests by community, Kodiak Area, 2015.

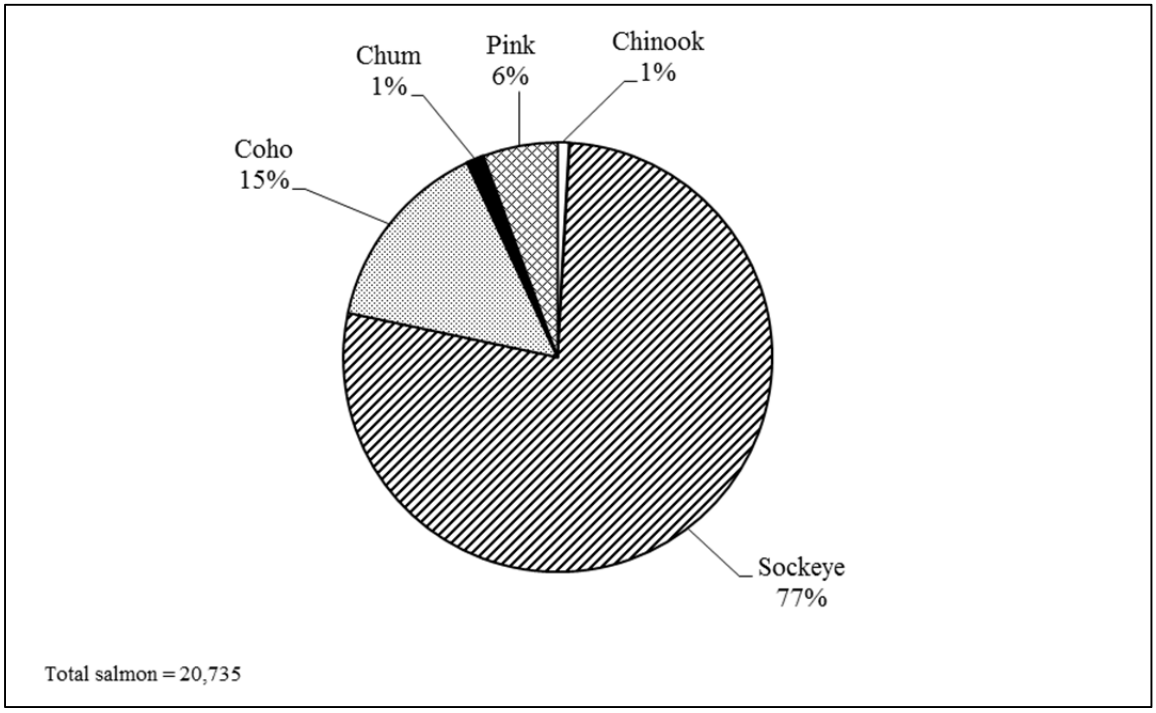

Figure 10-3.–Composition of Kodiak Area subsistence salmon harvest by species, 2015.

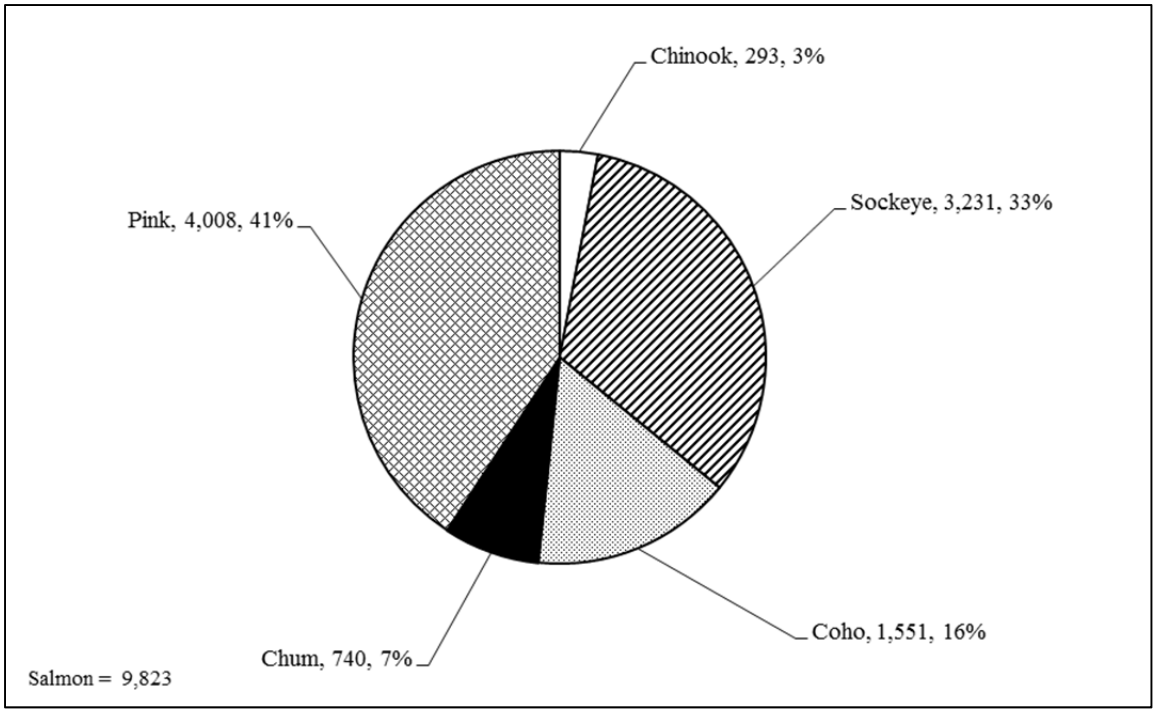

Figure 10-4.–Salmon retained from commercial harvests for home use, Kodiak Area, 2015.

CHAPTER 11: COOK INLET AREA

INTRODUCTION

As shown in Figure 11-1, most of the waters of the Cook Inlet Management Area are within the Anchorage–Matsu–Kenai Nonsubsistence Area as established by the Alaska Joint Board of Fisheries and Game [5 AAC 99.015 (3)]. Because subsistence fisheries are not permitted within nonsubsistence areas, noncommercial harvesting opportunities occur under sport, personal use, and educational fishing regulations (as well as limited opportunity under federal subsistence regulations). Commercial harvesters may retain finfish from lawfully taken commercial catch for home use ("home pack"). These fish are required to be reported on the commercial fish ticket, not on the subsistence salmon permit or personal use permit. In some parts of Alaska, in addition to gear authorized under subsistence fishing regulations, subsistence users report that substantial numbers of fish for home uses are taken with rod and reel (Fall, Turek, et al. 2009), which, in the Cook Inlet Area, is allowable gear under sport fishing regulations. Harvest summaries for the personal use, sport, educational, and commercial fisheries of the Upper Cook Inlet (UCI) Management Area can be found in annual management reports prepared by the ADF&G divisions of Sport Fish and Commercial Fisheries. A summary of the personal use salmon fisheries of the Cook Inlet Area follows the discussion of Cook Inlet subsistence fisheries.

Waters outside the nonsubsistence area include the Tyonek Subdistrict; the western portion of the Susitna River drainage; waters north of Point Bede that are west of a line from the easternmost point of Jakolof Bay and north of the westernmost point of Hesketh Island, including Jakolof Bay, and that are south of a line west of Hesketh Island; and those waters south of Point Bede which are west of the easternmost point of Rocky Bay, in Lower Cook Inlet.

Communities within the areas excluded from the nonsubsistence area include Skwentna (population 36 in 2015), Tyonek (population 175), Beluga (population 19), Seldovia (population 392 in the city and village CDP), Port Graham (population 177), and Nanwalek (formerly called English Bay, population 291). The population of the entire Cook Inlet area in 2015 was 456,350, including the Municipality of Anchorage (population 298,714), the Kenai Peninsula Borough (57,684), and the Matanuska-Susitna Borough (99,952). This represented 62% of the state's total population in 2015.[1]

PORT GRAHAM AND KOYUKTOLIK SUBDISTRICTS

History and Regulations

Subsistence regulations for this subsistence setnet fishery were first established by the BOF in 1980. The fishery is located along the southern shore of outer Kachemak Bay in the Port Graham and Koyuktolik subdistricts of the Southern District, and, beginning in 2002, the Port Chatham and Wind Bay subdistricts. Two predominately Alaska Native communities, Nanwalek and Port Graham, are located in the Port Graham Subdistrict. For a detailed description of this subsistence fishery and other subsistence harvests and uses in Nanwalek and Port Graham, see Stanek (1985).

The fishery is open in the Port Graham and Koyuktolik subdistricts from April 1 through September 30 and in the Port Chatham and Windy Bay subdistricts from April 1 through August 1, from 10:00 PM Thursday to 10:00 AM Wednesday. The area open for the subsistence setnet fishery includes the entire shoreline of the subdistrict to a regulatory marker near the head of Port Graham Bay. There are no household bag or possession limits. The 3 primary species harvested are sockeye, pink, and coho salmon. The gear allowed includes set gillnets no longer than 35 fathoms, no deeper than 45 meshes, and no larger than a 6-in stretched mesh. Returns of sockeye salmon, which are a majority of the harvest in the

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed May 2017. http://live.laborstats.alaska.gov/pop/index.cfm

subsistence fishery, have been poor in many of the past 20 years. However, in 2011 the return of sockeye salmon counted at the English Bay weir continued to surpass the inriver goal (Hollowell et al. 2012:5). In 2012, the return and harvest rates dropped again, with 961 sockeye salmon reported harvested by permit holders. Sockeye returns were much greater in 2013 with 4,888 sockeye salmon reported harvested, however in 2014 the number of sockeye harvest reported dropped significantly to 347 fish. In 2015, the harvest rose from the previous year to 877 sockeye salmon, but was still significantly less than the 2013 harvest.

Harvest Assessment Methods

In the past, the Division of Subsistence issued household permits through cooperative agreements with the Port Graham and Nanwalek village councils. However, in 2012, responsibility for the distribution, collection, and summation of subsistence permits for the communities of Seldovia, Port Graham, and Nanwalek was transferred from the Division of Subsistence to the Division of Commercial Fisheries, Homer Office. When permits are issued, a separate monthly harvest calendar is also issued for recording daily household harvests. Home use salmon harvests by the 2 communities occur with the use of setnets and rod and reel gear. While the recording of harvests in the setnet fishery is mandatory, it is not in the rod and reel fishery. Therefore, fishers are asked to voluntarily record their rod and reel harvests on their harvest permits. In order to accommodate the recording of harvests in both fisheries, the recording device has 2 pages, 1 for each gear type, and is issued separately from the permit. Area assistants hired by each village council collect the calendars periodically throughout the season. Arctic char/Dolly Varden harvests are also recorded on the calendars.

Sockeye salmon returns to the English Bay lakes were severely depressed for much of the late 1980s and early 1990s, with runs failing to achieve minimum escapement goals for 9 consecutive years between 1985 and 1993. Returns in the late 1990s were enhanced as a result of a rehabilitation enhancement project initiated by ADF&G and subsequently run by the Nanwalek Salmon Enhancement Project in association with the Chugach Regional Resources Commission (CRRC) and the village of Nanwalek (Hammarstrom and Dickson 2006:40). In 1992, the newly constructed Port Graham Hatchery, which primarily focused on pink salmon production, took transfer of the sockeye salmon enhancement program from the State of Alaska (ADF&G (Alaska Department of Fish and Game) 2017; Stopha 2012). Inseason escapement monitoring has taken place since 1994, with openings and closures in the subsistence and commercial fisheries controlled by emergency order. Inconsistent runs in recent years have been the result of disease outbreaks in the lake-rearing portion of the program and erratic adult behavior that caused difficulty in capturing broodstock (Hammarstrom and Dickson 2006:41). Personnel losses and financial limitations led Port Graham Hatchery Corporation (PGHC) to close the hatchery in 2007 and contract with Cook Inlet Aquaculture Association (CIAA) to continue the collection and incubation of English Bay sockeye salmon eggs at the CIAA Trail Lakes Hatchery. In 2014, CIAA purchased the Port Graham Hatchery and resumed production of pink salmon at that location (ADF&G (Alaska Department of Fish and Game) 2017)[2].

Harvest Estimates for 2015

In 2012, responsibility for the distribution, collection, and summarizing of subsistence permits for the communities of Seldovia, Port Graham, and Nanwalek were transferred from the Division of Subsistence to the Division of Commercial Fisheries, Homer Office. The change in administration authority included some change in methodology for Port Graham and Nanwalek; the Division of Subsistence contracted local research assistants in the villages to ensure distribution and collection of permits. This approach was dropped by Commercial Fisheries and instead the permits were sent to the IRA councils for distribution.

2. See also Cook Inlet Aquaculture Association, 2017, "Port Graham Hatchery." Accessed December 2017. http://www.ciaanet.org/hatcheries/port-graham-hatchery.html

In 2015, estimated salmon harvests for home uses in the Port Graham and Koyuktolik subdistricts totaled 2,371 salmon, including both subsistence setnet and reported rod and reel harvests (Table 11-1). The 2015 harvest was higher than the previous year (584 salmon), but a major decrease from the historical average of 5,230 salmon. Especially since 2012, reported harvests in this fishery likely do not represent total harvests due to low participation in the subsistence permit program.

In 2015, the number of permits issued was not recorded; however of those Port Graham residents who did obtain a permit, 4 returned permits and harvested 2,336 salmon (Table 11-2). Similarly, in Nanwalek the number of permits issued was not recorded, and only 1 resident returned a permit, reporting a harvest of 35 salmon, a decrease from 218 salmon in 2014, when 2 permits were retuned (Table 11-2). As shown in Table 11-2 and Figure 11-2, the combined harvest of the 2 communities of Nanwalek and Port Graham in 2015 included 877 sockeye salmon, the species with the highest harvest (37% of the overall harvest), closely followed by chum salmon (872; 37%), pink salmon (539; 23%), coho salmon (47; 2%), and Chinook salmon (36; 1%). Sockeye salmon harvests increased from 961 salmon in 2012 to 4,888 salmon in 2013, dropping to 347 sockeye in 2014, and rising to 877 in 2015.

SELDOVIA SUBSISTENCE FISHERY

History and Regulations

The BOF established this subsistence set gillnet fishery in 1995. The fishery is located on the south side of Kachemak Bay, near Seldovia, which is in the Southern District of the Lower Cook Inlet Fisheries Management Area. The subsistence fishery operates in a split season. The spring fishery, open April 1–May 30, targets natural Chinook salmon migrating through Lower Cook Inlet. The fall fishery, open the first 2 weekends of August, targets coho salmon.

In the spring season, fishing is allowed during two 48-hour periods each week, while in the fall season, fishing is open continuously during the 2-day weekends. The BOF has set a guideline harvest level (GHL) of 200 Chinook salmon and an annual possession limit of 20 Chinook salmon per household. There are no seasonal limits for other salmon species.

The area open to subsistence set gillnetting includes those waters along the eastern shore of Seldovia Bay as well as a short stretch outside Seldovia Bay to the west of Point Naskowhak. Seasons and bag limits were designed in 1995 to reduce potential interceptions of enhanced Chinook salmon bound for the stocking site in the Seldovia small boat harbor (Hollowell et al. 2012:14). The gear allowed includes set gillnets no longer than 35 fathoms, no deeper that 45 meshes, and no larger than a 6-in stretched mesh. Other standard permit conditions include prohibition of fishing within 300 ft of a dam, fish ladder, weir, culvert, or other artificial obstruction.

Harvest Assessment Methods

Household permits are issued by ADF&G prior to fishing, and harvests are recorded on the permits. Permits are also available from the harbormaster in Seldovia. Fishers are required to telephone daily harvest numbers to ADF&G or the harbormaster as well as to return their permits after each of the 2 fisheries. ADF&G sends reminder letters to permit holders if harvest records have not been returned in a timely manner, and telephone calls are also made to enhance permit returns.

The 2015 Season

There were 8 permits issued for the Seldovia subsistence fishery in 2015; 6 were returned (Table 11-3). The estimated harvest was 70 sockeye salmon (78% of the overall harvest), 16 Chinook salmon (18%), 4 pink salmon (4%), and no coho or chum salmon harvest (Figure 11-3). All 8 permits that were issued in 2015 were issued to residents of Seldovia (Table 11-3).

Total salmon harvests in 1998 through 2005 were higher than the first 2 years of the fishery, the result of a longer season that began in 1998 when the BOF lengthened the season by 10 days in May. The

additional fishing time resulted in increased harvests of both Chinook and sockeye salmon from 1998 through 2003 (Table 11-4). However, Chinook salmon harvests have declined since 2004, with 53 harvested in 2005, 23 harvested in 2006, 24 in 2007, 4 harvested in 2008, 15 harvested in 2009, 3 harvested in 2010, and no harvests in 2011. The year 2012 marked an increase with 8 Chinook salmon harvested, but then in 2013 the Chinook harvest decreased to 3 Chinook salmon reported harvested. In 2014, the number of Chinook harvest increased to 7, and in 2015 the number of Chinook salmon further increased to 16. Since the extension of fishing time in 1998, the 2006 season resulted in the lowest harvest estimate on record for total salmon harvested; the 2015 was the second-lowest. The 2015 harvest was less than the 5-year (2010–2014) average of 214 salmon and 10-year (2005–2014) average of 204 salmon, and less than the historical average of 242 salmon (Table 11-4).

TYONEK SUBDISTRICT

History and Regulations

Subsistence salmon fishing regulations for the Tyonek Subdistrict were established by court order in 1980 and subsequently permanently established by the BOF. This setnet fishery is located in the Tyonek Subdistrict of the Northern District of Upper Cook Inlet. The subdistrict includes the area from 1 mile south of the mouth of the Chuitna River south to the easternmost part of Granite Point and from the mean point of high tide to the mean point of lower low tide. The area is unique in that all the lands within the subdistrict are owned by the Tyonek Native Corporation. This feature often raises issues of trespass for those individuals living outside the Tyonek Area who do not seek prior permission to land their boats or set their nets on the privately-owned uplands. For a detailed discussion of this fishery and other subsistence uses at Tyonek, see Jones et al. (2015), Holen and Fall (2011), Stanek et al. (2007), and Fall et al. (1984).

In 2011 the Alaska Board of Fisheries modified the Northern District King Salmon Management Plan (5 AAC 21.366). This modification was in response to reduced abundance of Chinook salmon in the Northern District. The sport fishery on the Chuitna River, which is at the northern edge of the Tyonek Subdistrict, was closed, and commercial fishing was closed from a point just south of the community to the Susitna River in 2011 (Shields and Dupuis 2012:10).

The season in this subsistence fishery operates in 2 parts. The first part, which focuses on Chinook salmon, is open on Tuesdays, Thursdays, and Fridays from May 15–June 15. The second part is open Saturdays from June 16–October 15. In 2011 the Alaska Board of Fisheries specified the amounts of salmon reasonably necessary for subsistence in the Tyonek subdistrict as 700–2,700 Chinook salmon and 150–500 other salmon. A permit is required and 5 AAC 01.595 (a)(3) specifies that each permit holder may harvest 70 Chinook salmon in the Tyonek Subdistrict and 25 other salmon for the head of household and an additional 10 salmon for each dependent of the permit holder.

Allowable gear for the Tyonek Subdistrict subsistence fishery includes set gillnets 10 fathoms in length, no deeper than 45 meshes, and a stretched mesh sized no larger than 6 in. When fishing, permit holders are required to be present at the net site. Other standard permit conditions include prohibition of fishing within 300 ft of a dam, fish ladder, weir, culvert, or other artificial obstruction.

Harvest Assessment Methods

Household permits are issued by ADF&G prior to fishing, and harvests are recorded on the permit. A Division of Subsistence staff person travels to Tyonek each April and issues approximately 40–50 permits within several hours. Permits are also available in the Anchorage ADF&G office or in the Tyonek village office.

In the past annual salmon reports, all Tyonek Subdistrict salmon harvest numbers were based on reported permit data, partly due to the high return rate achieved from 1980–1990 when the fishery was limited to residents of Tyonek. For this report and reports to be published in the future, all salmon harvest data is

based on harvest estimates that were developed based on permit return rates by community. These estimated harvests replace the reported harvests that previously appeared in Table 11-6 in prior annual reports[3].

The 2015 Season

In 2015, 83 permits were issued for the Tyonek Subdistrict subsistence salmon fishery, including 60 permits issued to Tyonek residents (72%) and 23 permits issued to other Alaska residents, including 14 to residents of Anchorage (17%; Table 11-5). Residents of Tyonek accounted for 84% of the estimated harvest total (2,165 salmon), including 82% of the estimated Chinook salmon harvest (878 Chinook salmon) (Table 11-5).

The 2015 estimated harvest of 2,165 salmon was higher than the historical average of 1,834 salmon. The 2015 harvest was notably higher than the 2011 harvest of 1,107 salmon, which was the fourth lowest estimated harvest since 1980, although the number of returned permits (72) was higher than the historical average of 60 permits (Table 11-6). Of the total estimated subsistence salmon harvest in 2015, 1,070 were Chinook salmon (50%), 568 were coho salmon (26%), 505 were sockeye salmon (23%), 16 were chum salmon (1%), and 6 were pink salmon (<1%) (Figure 11-4).

UPPER YENTNA RIVER FISH WHEEL FISHERY

History and Regulations

This subsistence fish wheel fishery began in 1996 as a personal use fishery and was reclassified as a subsistence fishery by the BOF in 1998. It is located in the mainstem of the Yentna River from its confluence with Martin Creek upstream to its confluence with the Skwentna River. The fishery occurs from July 15 through July 31. Fishing periods are from 4:00 AM to 8:00 PM Mondays, Wednesdays, and Fridays. For a more detailed discussion of this fishery see Holen and Fall (2011).

Legal gear includes a fish wheel equipped with a live box. Permit holders must be present at the fish wheel while the wheel is fishing. A season limit of 2,500 salmon was established for the fishery. Chinook salmon and rainbow/steelhead trout must be returned alive to the water. Seasonal limits for households are 25 salmon for a household of 1 plus 10 salmon for each additional household member. Other standard permit conditions include prohibition of fishing within 300 ft of a dam, fish ladder, weir, culvert, or other artificial obstruction.

Harvest Assessment Methods

A permit issued by ADF&G is required prior to fishing. Permits are available through the Division of Sport Fish offices in Palmer and Anchorage. Permit holders must record their harvests on the permit and return it to ADF&G. Participants must also report their daily harvest of salmon to the Palmer ADF&G office by noon of the day following an open period. In the view of ADF&G, compliance with the permit requirement is high, and harvest estimates for this fishery are very reliable.

Harvests in 2015

In 2015, 29 subsistence permits were issued for the Yentna River subsistence fish wheel fishery, and 27 were returned (tables 11-7 and 11-8). In 2015, 12 of the 29 permit holders resided in the Skwentna area (41%), with the remaining 17 permits held by residents of other Cook Inlet area communities (Figure 11-5). Permit holders living in the community of Skwentna in 2015 harvested 289 of the reported 845 salmon, or 34% of the harvest (Table 11-7).

3. For more detailed information about reported and estimated harvest numbers see Jones, B. E. and D. Koster. In prep. Subsistence Harvests and Uses of Salmon in Tyonek, 2015 and 2016. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 439, Anchorage.

Of the total harvest of 845 salmon estimated for 2015, 578 were sockeye salmon (68%), 151 coho salmon (18%), 69 chum salmon (8%) and 47 pink salmon (46%), (Figure 11-6). There were no reported harvests of Chinook salmon nor is it legal to retain the harvest. The 2015 harvest of 845 salmon was higher than the 2014 harvest of 460 salmon. The 2015 harvest was more than the 5-year average of 602 salmon, more than the 10-year average of 500 salmon, and also more than the historical average of 545 salmon (Table 11-8).

FEDERAL SUBSISTENCE SALMON FISHERIES IN COOK INLET

Since 2007, federal regulations allow for the harvest of salmon, trout, and Dolly Varden by residents of Cooper Landing, Hope, and Ninilchik in the Kenai National Wildlife Refuge and Chugach National Forest. This includes the harvest of salmon by dip net in the Kenai River. In 2015, the total harvest in the federal fishery on the Kenai and Kasilof rivers was 2,058 salmon, most (2,056) of which were sockeye salmon and 2 were Chinook salmon (Table 11-9). There were a total of 187 permits issued to residents of these 3 communities, with 94 permits issued to residents of Cooper Landing, 34 to residents of Hope, and 59 to residents of Ninilchik (Table 11-9).

Table 11-10 shows the harvest in this fishery since it was established in 2007. In all 9 years, sockeye salmon are a majority of the harvest, with 2015 being the highest harvest, followed by 2009 at 1,943 sockeye salmon harvested by residents of the 3 Kenai Peninsula communities.

COOK INLET PERSONAL USE SALMON FISHERIES

Background

The BOF first established personal use salmon fisheries in the Cook Inlet Area in 1981 (Nelson et al. 1999:146). Since Alaska statehood in 1959, opportunities had been provided to harvest salmon for home uses with noncommercial set gillnets along various Cook Inlet beaches under subsistence regulations (Braund 1982rev.). In 1978, the new Alaska subsistence statute defined, for the first time, subsistence fishing as fishing for "customary and traditional" uses [AS 16.05.940(31, 33)]. In 1980, the BOF determined that only the noncommercial net fisheries in the Tyonek and Port Graham subdistricts met the criteria to qualify as customary and traditional subsistence fisheries. Therefore, the BOF created the "personal use" category of fishing regulations to continue providing opportunities for Alaskans to harvest salmon for home use with nets in areas of Cook Inlet that are generally accessible along the road system. In 1992, the Joint Board classified most of the Cook Inlet Area as a "nonsubsistence area," where subsistence fishing may not be permitted. Thus, in these areas, personal use fisheries are the primary means by which Alaska residents may obtain salmon for home uses using setnets or dip nets.

Due primarily to court decisions and legislation, personal use fishing regulations for Cook Inlet changed frequently in the 1980s and early 1990s. In 1981, the BOF created personal use dip net fisheries targeting sockeye salmon in the Kasilof and Kenai rivers. Until 1996, these fisheries opened only after achievement of escapement goals was projected. Since then, they have taken place within a fixed season. In 1986, the BOF created a personal use dip net fishery at the mouth of Fish Creek (Knik Arm) focusing on sockeye salmon. A fourth Upper Cook Inlet dip net fishery began in 2008 in the lower portion of the Beluga River on the western shore of Cook Inlet; this fishery is open only to Alaska residents 60 years of age or older. In most years since 1981, personal use set gillnet fisheries in the Cook Inlet Area have been limited to Kachemak Bay and an area at the mouth of the Kasilof River. For more detail on the history of subsistence and personal use salmon fisheries in the Cook Inlet Area, see Braund (1982rev.), Fall and Stanek (1990), Brannian and Fox (1996), Nelson (1994), Nelson (1995), Nelson et al. (1999), and Dunker (2010). Table 11-11 summarizes harvest data for selected Cook Inlet personal use and subsistence fisheries that are no longer authorized by state regulations.

Upper Cook Inlet Personal Use Salmon Fisheries

Presently, personal use salmon fisheries in the Upper Cook Inlet Area are governed by the provisions of the Upper Cook Inlet Personal Use Salmon Fishery Management Plan (5 AAC 77.540). Participants must possess an Alaska resident sport fishing license and obtain an Upper Cook Inlet Personal Use Fishing Permit for their household. Permit holders and household members may participate in any of the upper inlet personal use salmon fisheries (except, as noted, the Beluga River fishery is only open to Alaska residents 60 years of age or older). For all the fisheries combined, the annual limit is 25 salmon for the permit holder and 10 salmon for each additional household member. Permits must be returned to ADF&G at the end of the season with a record of the harvest.

In 2015, 34,916 permits were issued for Upper Cook Inlet personal use fisheries, excluding the Beluga River dip net fishery. For the 4 fisheries combined (including unknown fishing locations), the estimated harvest was 541,942 salmon, including 521,985 sockeye (96%), and there were lower totals for the other 4 species (Table 11-12). The estimated harvest in 2015 was lower than the previous year in these fisheries, and also was below the 5-year (2010–2014) average of 565,132 salmon. For 1996 through 2014, the average annual harvest was 348,782 salmon; although participation and harvest grew steadily (Table 11-13).

Table 11-14 reports the number of permits issued for these 4 Upper Cook Inlet personal use fisheries and the estimated harvest by place of residence of the permit holder. Residents of the Municipality of Anchorage (including Anchorage, Chugiak, Eagle River, JBER [Joint Base Elmendorf/Richardson], and Girdwood) held the most permits (57%) and accounted for 56% of the harvest, followed by Kenai Peninsula Borough residents (19% of permits; 19% of harvests), Matanuska–Susitna Borough residents (19% of permits; 20% of harvest), residents of other Alaska communities (4% of permits; 4% of harvest), and permit holders for whom a community of residence could not be established (1% of permits; 1% of harvest).

Kasilof River Personal Use Setnet Fishery

This fishery takes place at the mouth of the Kasilof River between regulatory markers approximately 1 mile on either side of the river. Legal gear is a set gillnet no more than 10 fathoms in length, 6 inches in mesh size, and 45 meshes in depth. The fishery is open daily from 6:00 AM to 11:00 PM from June 15 through June 24. In 2015, the total estimated harvest in the fishery was 27,841 salmon, of which 27,567 (99%) were sockeye salmon. (Note that the harvests for this setnet fishery plus the dip net fisheries in the Kasilof River, the Kenai River, and Fish Creek are reported through a single permit system, the combined estimated totals are reported above.) The average annual harvest from 1996 through 2014 was 19,744 salmon (Table 11-15).

Kasilof River Dip Net Fishery

This dip net fishery takes place in the lower mile of the Kasilof River 24 hours per day from June 25 through August 7. Retention of Chinook salmon in this fishery is prohibited. The estimated harvest in 2015 was 93,927 salmon, of which 95% was sockeye salmon. From 1996 through 2014, the average annual harvest in this fishery was 51,448 salmon (Table 11-16).

Kenai River Dip Net Fishery

This dip net fishery takes place in the lower Kenai River downriver of the Warren Ames Bridge. Fishing is open from July 10 through July 31, 7 days per week from 6:00 AM to 11:00 PM; when the abundance of sockeye salmon is greater than 2 million fish, the fishery may be open by emergency order 24 hours a day. No more than 1 Chinook salmon per permit may be retained in this fishery. Estimated harvests totaled 386,852 salmon in 2015, including 377,532 sockeye salmon (98%). The average annual harvest from 1996 through 2014 was 263,403 salmon, with harvest—along with participation—rising markedly over that period (Table 11-17).

Fish Creek Dip Net Fishery

This dip net fishery opens by emergency order if the department projects an escapement into Fish Creek (Knik Arm) of more than 50,000 sockeye salmon. The season is July 10 through July 31. Open waters extend from the terminus of Fish Creek upstream to one-quarter of a mile above the Knik–Goose Bay Road. No Chinook salmon may be retained in this fishery. In 2015 the estimated harvest totaled 24,239 salmon, 79% of which was sockeye salmon, 14% coho salmon and 5% pink salmon and 1% chum salmon. This was higher than the harvest of 12,169 salmon estimated for 2014. The fishery did not open from 2002 through 2008 and from 2012–2013. The average annual harvest for those years with an open fishery was 9,585 salmon (Table 11-18).

Unknown Upper Cook Inlet Personal Use Dip Net Fishery

Because not all participants in the Upper Cook Inlet personal use dip net fisheries indicate the location of their fishing activities when they return their permits, an estimate of harvests in an "unknown" Upper Cook Inlet dip net fishery is produced annually. Harvests that could not be attributed to one of the 4 Upper Cook Inlet personal use fisheries (3 dip net fisheries and 1 set net fishery) (excluding the Beluga River fishery, which is discussed below) were estimated at 9,083 salmon in 2015, 95% of which was sockeye salmon (8,626 sockeye salmon reported harvested) (Table 11-19).

Beluga River Personal Use Salmon Fishery

Participation in this dip net fishery, which first took place in 2008, is limited to Alaska residents 60 years of age or older. The fishery is open 24 hours per day from July 10 to August 31 within the Beluga River, western Cook Inlet, from about one-quarter mile upstream of the Beluga River bridge to about 1 mile below the bridge. The fishery operates under the single seasonal limit for Cook Inlet Area personal use salmon fisheries (25 salmon for the permit holder and 10 additional salmon for each dependent), except only 1 Chinook salmon may be retained. Participants must report their harvest weekly to ADF&G, and the fishery closes when 500 salmon have been harvested (5 AAC 77.540(g)). Harvests totaled 82 salmon in 2015, compared to 46 salmon in 2014, 88 salmon in 2013, 16 salmon in 2012, 159 salmon in 2011, 53 salmon in 2010, 225 salmon in 2009, and 66 salmon in 2008 (Table 11-20). Harvest data by place of residence are presently not available for this fishery, and totals for this fishery are not included with other Upper Cook Inlet personal use fisheries summarized in Table 11-14.

Lower Cook Inlet Personal Use Salmon Fisheries

Kachemak Bay Setnet Fishery

This setnet fishery along Kachemak Bay in the Lower Cook Inlet Management Area was a subsistence fishery before being reclassified as a personal use fishery in the early 1980s. By regulation, the fishery is open from August 16 through September 15, from 6:00 AM Monday until 6:00 AM Wednesday and from 6:00 AM Thursday until 6:00 AM Saturday. The fishery closes when a guideline harvest range of 1,000–2,000 coho salmon has been achieved. Participants must obtain a permit from the Homer ADF&G office—this is separate from the permit program for the Upper Cook Inlet personal use fisheries. Seasonal limits are 25 salmon for the permit holder and 10 salmon for each additional household member (5 AAC 77.549). Fishers must phone the Homer ADF&G office to report their daily harvests.

In 2015, the reported harvest, based on 131 returned permits (96% of the 136 permits issued), was 2,066 salmon, of which 1,373 (66%) were coho. The recent 10-year average harvest for this fishery (2005–2014) was 1,787 salmon (Table 11-21). Harvest data by place of residence are presently not available for this fishery. Table 11-21 also provides historical harvests for this fishery for 1969 through 2015.

China Poot Dip Net Fishery

This personal use dip net fishery first opened in 1980. It takes place in China Poot Bay, approximately 4 miles southeast of the Homer Spit, on the south side of Kachemak Bay. This area is not accessible by

road. The fishery targets enhanced sockeye salmon (stocked by the Cook Inlet Aquaculture Association) that have escaped the commercial fishery. Personal use fishers must have a valid Alaska resident sport fishing license, but a permit is not required. The season is July 1 through August 7. Only sockeye salmon may be retained in this fishery, with a bag and possession limit of 6 fish (5 AAC 77.545). Since 1996, ADF&G has not estimated harvests in this fishery. Table 11-22 summarizes historical harvest data for this fishery for 1980–1995. During those years, sockeye salmon harvests ranged between 794 (in 1985) and 8,605 (in 1995) and averaged 3,373 sockeye salmon. The annual average participation in this fishery was 1,215 fishers.

OTHER SUBSISTENCE FISHERIES IN COOK INLET

Federal halibut subsistence harvest data are currently available for communities and tribes in the Cook Inlet area. Residents of Port Graham, Nanwalek, and Seldovia participate in this program, as well as tribal members living in other Cook Inlet Area communities. For the findings for 2014, see Fall and Lemons (2016). Due to lack of funding, no harvest estimate for the subsistence halibut fishery is available for 2015.

There are no annual harvest assessment programs for other subsistence finfish fisheries in Cook Inlet. Harvest estimates based on comprehensive household surveys conducted by the Division of Subsistence are available in the CSIS for freshwater and marine species spanning multiple years for selected Cook Inlet communities. Of note in Lower Cook Inlet are rockfish (*Sebastes*) documented in Turek et al. (2009). Information on other fish species used in Upper Cook Inlet by Tyonek and Beluga residents can be found in Stanek et al. (Holen et al. 2014; Jones et al. 2015; 2007).

Table 11-1.–Historical subsistence salmon harvests, Port Graham and Koyuktolik subdistricts, 1981–2015.

	Permits		Reported salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1981	ND	57	138	2,670	825	177	874	4,684
1982	ND	61	124	2,354	1,493	220	2,932	7,123
1983	ND	46	67	2,480	471	95	187	3,300
1984	ND	24	45	3,262	510	6	673	4,496
1985	ND	24	146	1,177	621	26	345	2,315
1986	ND	44	125	647	481	14	1,062	2,329
1987	ND	55	21	901	914	114	714	2,664
1988	ND	48	104	1,021	844	110	1,756	3,835
1989	ND	44	51	157	1,155	74	1,495	2,932
1990	ND	60	265	1,162	1,417	151	2,960	5,955
1991	ND	63	163	688	2,053	221	4,587	7,712
1992	ND	71	200	535	1,150	236	1,421	3,542
1993	ND	56	277	1,148	913	257	2,663	5,258
1994	ND	70	300	830	1,370	504	1,979	4,983
1995	ND	87	585	1,795	538	376	1,273	4,567
1996	ND	75	310	1,744	939	276	749	4,018
1997	ND	26	202	325	203	153	511	1,394
1998	ND	19	169	289	243	240	459	1,400
1999	ND	74	485	3,157	1,747	1,104	2,023	8,516
2000	ND	67	259	4,664	1,831	953	1,606	9,313
2001	ND	49	133	1,085	1,295	228	1,454	4,195
2002	ND	79	346	10,620	1,057	488	1,831	14,342
2003	ND	52	465	5,534	1,006	532	1,572	9,109
2004	ND	80	312	3,525	1,303	213	1,600	6,953
2005	ND	68	292	2,126	1,193	180	1,608	5,399
2006	ND	53	275	2,559	1,200	296	2,131	6,461
2007[a]	ND	24	92	532	0	63	74	761
2008	ND	48	124	4,352	1,448	269	2,682	8,875
2009	ND	44	44	3,497	528	140	914	5,123
2010[a]	ND	35	30	1,630	1,448	308	1,054	4,470
2011	ND	53	53	5,702	1,491	511	2,632	10,389
2012	ND	8	24	961	414	31	482	1,912
2013	ND	14	17	4,888	2,685	897	410	8,897
2014	ND	7	19	347	10	44	164	584
2015	ND	5	36	877	47	872	539	2,371
5-year average (2010–2014)	-	23	29	2,706	1,210	358	948	5,250
10-year average (2005–2014)	-	35	97	2,659	1,042	274	1,215	5,287
Historical average (1981–2014)	-	50	1,245	1,664	652	859	3,334	5,230

Source Hollowell et al. (2016). ADF&G Division of Subsistence, 1981–2011.

Note There are no records indicating the numbers of permits issued for any year. Only the numbers of permits returned are recorded. For this reason, averages of the number of permits issued cannot be calculated (indicated with "-").

a. Harvest reports are incomplete.

Table 11-2.–Subsistence salmon harvests by community, Port Graham and Koyuktolik subdistricts, 2015.

	Permits		Reported salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Nanwalek	ND	1	0	35	0	0	0	35
Port Graham	ND	4	36	842	47	872	539	2,336
Total	**-**	**5**	**36**	**877**	**47**	**872**	**539**	**2,371**

Source Hollowell et al. (2016).

Note There are no records indicating the numbers of permits issued for any year. Only the numbers of permits returned are recorded. For this reason, averages of the number of permits issued cannot be calculated (indicated with "-").

Table 11-3.–Subsistence salmon harvests by community, Seldovia, 2015.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Seldovia	8	6	16	70	0	0	4	90
Total	**8**	**6**	**16**	**70**	**0**	**0**	**4**	**90**

Source Hollowell et al. (2016).

Table 11-4.–Historical subsistence salmon harvests, Seldovia, 1996–2015.

	Permits		Estimated salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1996	43	42	51	9	0	0	0	60
1997	20	17	52	22	0	0	0	74
1998	22	20	143	65	0	8	0	216
1999	16	16	136	130	0	38	0	304
2000	22	22	179	252	0	16	0	447
2001	19	16	149	142	0	0	0	290
2002	20	20	124	234	13	11	31	413
2003	18	15	117	290	2	66	22	496
2004	14	12	102	69	5	18	65	258
2005	18	16	53	74	14	11	100	251
2006	17	11	23	12	0	0	31	66
2007	19	15	24	66	12	35	103	239
2008	11	9	4	38	50	6	79	177
2009	18	17	15	115	22	13	77	242
2010	16	12	3	133	41	47	88	312
2011	7	4	0	96	0	0	18	114

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Table 11-4.–Page 2 of 2.

Year	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2012	20	7	8	79	0	0	54	141
2013	12	8	3	147	2	15	68	234
2014	21	15	7	162	0	91	7	267
2015	8	6	16	70	0	0	4	90
5-year average (2010–2014)	15	9	4	124	9	31	47	214
10-year average (2005–2014)	16	11	14	92	14	22	62	204
Historical average (1997–2014)	19	15	63	112	8	20	39	242

Source Hollowell et al. (2016); ADF&G Division of Subsistence, 1996–2011.

Table 11-5.–Subsistence salmon harvests by community, Tyonek Subdistrict, 2015.

Community	Permits		Estimated salmon harvests					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Anchorage	14	12	147	60	34	0	0	240
Big Lake	3	0	0	0	0	0	0	0
Eagle River	2	2	0	0	0	0	0	0
Kenai	1	1	33	12	12	2	0	59
Nikiski	1	1	6	34	0	0	0	40
Palmer	1	1	6	5	7	0	0	18
Soldotna	1	1	0	0	0	0	0	0
Tyonek	60	54	878	394	516	14	6	1,808
Total	**83**	**72**	**1,070**	**505**	**568**	**16**	**6**	**2,165**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 11-6.–Historical subsistence salmon harvests, Tyonek Subdistrict, 1980–2015.

Year	Permits		Estimated salmon harvests					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1980	67	67	1,936	262	0	0	0	2,198
1981	70	70	2,002	269	64	32	15	2,382
1982	69	69	1,590	310	113	4	14	2,031
1983	73	73	2,755	251	78	6	0	3,090
1984	70	70	2,364	310	66	23	3	2,766
1985[a]	176	ND	1,967	163	91	10	0	2,231
1986[a]	101	ND	1,674	198	210	44	45	2,171
1987	64	61	1,689	174	156	25	10	2,055
1988	47	42	1,776	102	283	13	9	2,183
1989	49	47	1,303	89	120	1	0	1,513
1990	42	37	886	75	400	14	23	1,397

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Table 11-6.–Page 2 of 2.

Year	Permits		Reported salmon harvests					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1991	57	54	925	20	69	0	0	1,014
1992	57	44	1,170	96	294	24	9	1,594
1993	62	54	1,566	68	88	25	23	1,769
1994	58	49	905	101	122	27	0	1,154
1995	70	55	1,632	54	186	18	0	1,891
1996	73	49	1,615	88	177	9	27	1,917
1997	70	42	1,051	200	241	13	0	1,505
1998	74	49	1,430	251	97	3	2	1,783
1999	77	54	1,620	247	175	20	66	2,127
2000	60	47	1,461	78	103	0	8	1,649
2001	84	58	1,450	254	72	9	6	1,790
2002	101	71	1,609	314	162	6	14	2,106
2003	87	74	1,384	136	54	12	9	1,595
2004	97	75	1,751	121	168	0	0	2,040
2005	78	67	1,183	65	159	2	0	1,409
2006	82	55	1,366	32	23	1	0	1,422
2007	84	67	1,526	249	164	3	4	1,946
2008	94	77	1,492	146	227	11	16	1,892
2009	89	69	817	229	320	2	1	1,369
2010	105	77	1,116	281	223	3	3	1,626
2011	114	63	851	202	34	10	10	1,107
2012	89	69	1,102	223	174	3	5	1,507
2013	82	48	1,352	278	311	0	32	1,973
2014	92	73	896	487	575	15	5	1,978
2015	83	72	1,070	505	568	16	6	2,165
5-year average (2010–2014)	96	66	1,063	294	263	6	11	1,638
10-year average (2005–2014)	91	67	1,170	219	221	5	8	1,623
Historical average (1981–2014)	79	60	1,463	184	166	11	10	1,834

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. Harvests were not expanded due to unknown permit returns.

ND = No data

Table 11-7.–Subsistence salmon harvests by community, Upper Yentna River, 2015.

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook[a]	Sockeye	Coho	Chum	Pink	Total
Anchorage	1	1	0	28	12	0	0	40
Big Lake	1	1	0	8	0	4	8	20
Chugiak	4	4	0	116	27	26	2	171
Eagle River	2	2	0	43	7	0	0	50
Skwentna	12	11	0	184	48	25	32	289
Talkeetna	1	1	0	34	11	4	0	49
Unknown City	1	0	0	0	0	0	0	0
Wasilla	5	5	0	121	31	3	1	156
Willow	2	2	0	44	15	7	4	70
Total	**29**	**27**	**0**	**578**	**151**	**69**	**47**	**845**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. Regulations prohibit the retention of Chinook salmon in this fishery (5 AAC 01.593).

Table 11-8.–Historical subsistence and personal use salmon harvests, Upper Yentna River, 1996–2015.

Year	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook[b]	Sockeye	Coho	Chum	Pink	Total
1996[a]	17	17	0	242	46	51	115	454
1997[a]	24	21	0	549	83	10	30	672
1998	21	18	0	495	113	15	30	653
1999	18	16	0	516	48	13	18	595
2000	19	19	0	379	92	7	4	482
2001	16	15	0	545	50	4	10	608
2002	25	22	0	454	133	31	14	632
2003	19	15	0	553	67	8	2	630
2004	21	19	0	441	146	3	36	625
2005	18	17	0	177	42	25	24	268
2006	22	22	0	368	175	26	14	583
2007	22	22	0	367	66	18	17	468
2008	16	16	0	310	57	7	23	397
2009	17	17	0	253	14	6	0	273
2010	32	32	0	642	50	18	38	748
2011	25	25	0	598	90	21	337	1,046
2012	21	21	0	279	24	19	21	343
2013	22	19	0	160	92	32	128	412
2014	20	18	0	328	84	32	17	460
2015	29	27	0	578	151	69	47	845
5-year average (2010–2014)	24	23	0	401	68	24	108	602
10-year average (2005–2014)	22	21	0	348	69	20	62	500
Historical average (1996–2014)	21	20	0	403	77	18	46	545

Source ADF&G Division of Subsistence, ASFDB 2015 (ADF&G 2016).

a. This fishery was classified as personal use in 1996 and 1997; it has been a subsistence fishery since 1998.

b. Regulations prohibit the retention of Chinook salmon in this fishery (5 AAC 01.593).

Table 11-9.–Federal subsistence salmon harvests by community, Kenai and Kasilof rivers, 2015.

	Permits		Reported salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Cooper Landing	94	90	0	1,271	0	0	0	1,271
Hope	34	32	0	402	0	0	0	402
Ninilchik	59	58	2	383	0	0	0	385
Total	**187**	**180**	**2**	**2,056**	**0**	**0**	**0**	**2,058**

Source Jeffry Anderson, USFWS, Kenai Fish & Wildlife Field Office, personal communication.

Table 11-10.–Historical federal subsistence salmon harvests, Kenai and Kasilof rivers, 2007–2015.

	Permits		Reported salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2007	136	131	0	742	5	0	0	747
2008	160	151	2	1,716	12	0	0	1,730
2009	160	138	0	1,104	9	0	0	1,113
2010	169	151	0	943	0	0	0	943
2011	131	123	0	1,090	0	0	0	1,090
2012	133	121	0	1,438	0	0	0	1,438
2013	142	138	0	1,515	4	0	0	1,519
2014	153	145	0	1,941	2	0	0	1,943
2015	187	180	2	2,056	0	0	0	2,058

Source Jeffry Anderson, USFWS, Kenai Fish & Wildlife Field Office, personal communication.

Table 11-11.–Miscellaneous Upper Cook Inlet personal use and subsistence salmon harvests, 1981–1995.

Year[a]	Permits		Reported salmon harvest					
	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Noncommercial gillnet fishery								
1981	1,108	NA	68	466	12,713	305	149	13,701
Fall coho personal use/subsistence								
1983	295	NA	0	0	712	0	0	712
1984	309	NA	1	2	2,261	7	10	2,281
1985	998	NA	50	805	11,265	53	108	12,281
1986	892	NA	0	0	2,422	0	0	2,422
1987	486	NA	8	9	2,213	37	2	2,269
1988	449	NA	2	19	2,662	10	38	2,731
1989	365	NA	0	0	2,376	0	0	2,376
1990	420	NA	0	0	2,290	0	0	2,290
1991[b]	360	NA	0	0	2,703	8	0	2,711
1993	535	NA	0	0	1,168	0	23	1,191
Northern/Central districts subsistence/personal use setnet								
1985[d]	638	NA	117	2,218	1,427	121	90	3,973
1991	7,065[e]	NA	496	20,855	3,372	1,596	517	26,836
1992	9,200[e]	NA	957	28,949	8,821	1,753	1,217	41,697
1994	10,127[e]	NA	1,260	36,701	9,509	1,601	1,653	50,724
1995	9,300[e]	NA	1,294	45,259	9,678	1,665	1,236	59,132
Knik Arm subsistence								
1985	405	NA	4	1,649	2,055	212	48	3,968

Source Ruesch and Fox (1996); Brannian and Fox (1996).

a. Years listed are only the years in which the fishery was open.

b. In 1991, the fall coho fishery operated as a personal use fishery separate from subsistence setnet fisheries (Ruesch and Fox 1992).

c. Summary data reported in Ruesch and Fox (1996) and in Brannian and Fox (1996) include dip net and setnet harvests. Here, only setnet harvests are included. See separate tables for the Kasilof River dip net fishery and the Kenai River dip net fishery for harvest data for those fisheries.

d. In 1985, this subsistence fishery was open in areas generally open to commercial fishing, except for the Upper Subdistrict, which had a separate season and permit (called the "fall coho fishery" in this table). The Knik Arm subsistence gillnet fishery was also administered separately in 1985 (Ruesch 1987).

e. For 1991, 1992, 1994, and 1995, the number of permits issued includes all Upper Cook Inlet dip net and setnet fisheries except the Tyonek subdistrict.

NA = Data not available.

Table 11-12.–Cook Inlet personal use salmon fisheries, 2015.

	Permits		Estimated salmon harvest[b]					
Year[a]	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Lower Cook Inlet								
Kachemak Bay setnet	136	131	10	509	1,373	22	152	2,066
China Poot Bay dip net[a]								
Subtotal, Lower Cook Inlet	**136**	**131**	**10**	**509**	**1,373**	**22**	**152**	**2,066**
Upper Cook Inlet								
Kasilof River setnet[c]			61	27,567	191	2	20	27,841
Kasilof River dip net[c]			0	89,000	2,723	597	1,607	93,927
Kenai River dip net[c]			66	377,532	4,150	957	4,147	386,852
Fish Creek dip net[c]			0	19,260	3,321	329	1,329	24,239
Unknown Upper Cook Inlet[c]			0	8,626	263	41	153	9,083
Subtotal, common permit fisheries[c]	**34,920**	**27,119**	**127**	**521,985**	**10,648**	**1,926**	**7,256**	**541,942**
Beluga River dip net	8	8	0	65	17	0	0	82
Subtotal, Upper Cook Inlet	**34,928**	**27,127**	**127**	**522,050**	**10,665**	**1,926**	**7,256**	**542,024**
Cook Inlet Total	**35,064**	**27,258**	**137**	**522,559**	**12,038**	**1,948**	**7,408**	**544,090**

Source ADF&G Division of Sport Fish

a Permits are not issued for this fishery and harvest estimates are not produced.
b Estimated harvests for all fisheries except Kachemak Bay setnet. Only reported harvests are available.
c A single permit is issued for the Kasilof setnet, Kasilof dip net, Kenai dip net, and Fish Creek dip net fisheries. In some cases, returned permits did not indicate the area fished.

Table 11-13.–Estimated personal use salmon harvests, Upper Cook Inlet personal use fishery total, 1996–2015.

	Permits		Estimated salmon harvest					
Year	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1996	14,576	13,452	452	145,545	4,811	350	2,973	154,131
1997	14,919	13,756	464	148,940	777	88	844	151,113
1998	15,535	13,190	549	176,581	2,685	220	1,933	181,968
1999	17,197	14,216	1,108	208,589	1,413	168	2,078	213,356
2000	16,107	13,582	1,102	149,267	3,638	290	2,482	156,779
2001	16,915	14,398	1,138	218,688	2,637	276	1,821	224,560
2002	17,568	14,284	1,070	259,623	3,271	757	8,470	273,191
2003	19,110	15,726	1,711	298,831	2,250	371	2,082	305,245
2004	21,910	17,748	1,098	350,091	3,754	502	2,715	358,160
2005	21,905	19,081	1,132	369,776	3,415	428	2,520	377,271
2006	18,563	16,532	1,405	216,047	3,759	746	12,434	234,391
2007	23,046	20,312	1,924	356,717	2,727	614	2,352	364,334
2008	23,722	20,259	1,601	318,594	3,249	727	11,869	336,040
2009	29,619	25,029	1,384	457,539	4,204	559	6,969	470,655
2010	31,590	25,222	1,059	514,255	8,405	1,090	6,482	531,291
2011	34,515	27,193	1,453	630,242	6,754	1,169	4,879	644,497
2012	34,315	27,080	167	629,757	5,512	627	4,854	640,757
2013	35,211	26,772	84	454,315	5,119	1,053	4,424	464,995
2014	35,989	27,866	50	506,047	9,370	1,859	26,795	544,121
2015	34,916	27,115	127	521,985	10,648	1,926	7,256	541,942
5-year average (2010–2014)	34,324	26,827	563	546,923	7,032	1,160	9,487	565,132
10-year average (2005–2014)	28,848	23,535	1,026	445,329	5,251	887	8,358	460,835
Historical average (1996–2014)	23,280	19,247	997	337,339	4,092	626	5,736	348,782

Source ADF&G Division of Sport Fish

Note Does not include the Beluga River dip net fishery.

Table 11-14.–Personal use salmon harvest estimates by community, Upper Cook Inlet, 2015.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Anchor Point	277	234	1	4,099	30	7	39	4,177
Clam Gulch	47	39	0	714	3	1	3	721
Cooper Landing	24	21	0	203	1	0	2	206
Fritz Creek	34	31	1	516	1	1	1	520
Halibut Cove	1	0	0	11	0	0	0	12
Homer	827	688	3	12,440	75	18	122	12,659
Hope	22	20	0	166	1	1	0	169
Kasilof	461	394	7	7,622	73	4	34	7,740
Kenai	1,768	1,415	8	27,342	273	30	226	27,879
Moose Pass	28	24	0	391	2	0	4	398
Nanwalek	1	1	0	25	0	0	0	25
Nikiski	233	188	3	3,815	16	10	25	3,869
Nikolaevsk	19	17	0	299	1	0	2	303
Ninilchik	160	132	0	2,131	14	4	15	2,164
Seldovia	13	13	0	284	0	0	7	291
Seward	177	147	0	2,548	14	59	23	2,644
Soldotna	2,053	1,733	18	31,020	179	37	146	31,399
Sterling	481	426	3	7,033	22	3	49	7,110
Subtotal, Kenai Peninsula Borough	**6,626**	**5,523**	**45**	**100,659**	**706**	**176**	**698**	**102,284**
Anchorage	16,429	12,428	44	241,529	4,569	1,208	3,790	251,140
Chugiak	704	572	1	11,465	210	25	81	11,782
Eagle River	2,106	1,774	5	32,889	605	58	408	33,965
Girdwood	208	171	0	3,216	16	2	23	3,257
Joint Base Elmendorf Richardson	346	243	0	4,434	206	10	93	4,744
Subtotal, Anchorage Municipality	**19,793**	**15,188**	**51**	**293,533**	**5,607**	**1,303**	**4,396**	**304,889**
Big Lake	218	149	1	3,031	95	24	50	3,202
Chickaloon	9	6	0	119	1	0	1	121
Houston	43	32	0	585	65	10	10	669
Palmer	1,797	1,436	6	26,193	668	118	401	27,386
Sutton	78	64	0	1,063	74	2	46	1,185
Talkeetna	82	62	3	1,367	113	7	27	1,517
Trapper Creek	35	30	1	649	29	0	7	686
Wasilla	4269	3287	15	64,854	2,519	197	1,315	68,899
Willow	158	136	0	2,423	36	5	22	2,487
Subtotal, Matanuska-Susitna Borough	**6,689**	**5,202**	**26**	**100,284**	**3,599**	**363**	**1,879**	**106,152**
Akiachak	1	0	0	11	0	0	0	12
Akiak	2	1	0	11	0	0	0	12
Allakaket	1	1	0	0	0	0	0	0

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Table 11-14.–Page 2 of 4.

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Ambler	1	1	0	45	0	0	0	45
Anaktuvuk Pass	1	0	0	11	0	0	0	12
Anderson	3	3	0	85	0	0	6	91
Arctic Village	1	1	0	24	0	0	0	24
Atqasuk	1	1	0	23	0	0	0	23
Barrow	77	35	1	1,445	23	3	11	1,484
Bethel	17	10	0	233	2	0	2	237
Cantwell	5	4	0	101	0	0	1	103
Central	2	2	0	64	0	0	0	64
Chefornak	2	1	0	11	0	0	0	12
Chenega Bay	2	1	0	11	0	0	0	12
Chevak	1	0	0	11	0	0	0	12
Chicken	1	1	0	7	0	0	0	7
Circle	1	1	0	26	0	0	0	26
Clear	5	4	0	74	0	0	3	78
Copper Center	3	3	0	46	0	0	1	47
Cordova	6	3	0	60	1	0	1	62
Craig	2	1	0	34	0	0	0	35
Delta Junction	39	35	0	1,035	1	0	1	1,038
Denali National Park	15	13	0	290	4	0	8	303
Dillingham	3	1	0	24	1	0	0	26
Eagle	2	2	0	15	5	0	13	33
Eek	1	0	0	11	0	0	0	12
Eielson AFB	21	17	0	200	117	0	1	319
Ester	9	7	0	142	1	0	1	145
Fairbanks	594	469	0	9,190	161	17	72	9,440
Fort Greely	2	2	0	0	36	0	0	36
Fort Wainwright	30	22	0	327	12	0	6	345
Gakona	1	1	0	65	0	0	0	65
Galena	1	1	0	34	0	0	0	34
Gambell	3	1	0	92	1	0	0	94
Glennallen	7	4	0	105	1	0	1	107
Gustavus	2	2	0	16	0	0	0	16
Haines	3	1	0	52	1	0	0	54
Healy	54	49	0	901	43	4	24	972
Holy Cross	1	0	0	11	0	0	0	12
Hooper Bay	1	0	0	11	0	0	0	12
Huslia	1	1	0	0	0	0	0	0
Juneau	37	30	0	607	2	0	7	616
Kaktovik	4	2	0	45	1	0	0	47
Kalskag	1	1	0	33	0	0	0	33
Ketchikan	11	5	0	234	2	0	2	239
Kiana	1	0	0	11	0	0	0	12
Kodiak (city)	10	8	0	152	2	0	2	157
Kotzebue	21	18	0	419	1	0	1	421
Koyuk	4	3	0	70	0	0	0	71

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Table 11-14.–Page 3 of 4.

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Kwethluk	1	1	0	0	1	0	0	1
Kwigillingok	2	0	0	22	1	0	0	24
McGrath	6	5	0	169	0	0	0	170
Mentasta Lake	1	0	0	11	0	0	0	12
Minto	1	1	0	0	0	0	0	0
Mountain Village	1	1	0	0	0	0	0	0
Nenana	8	7	0	151	0	0	0	152
Noatak	5	4	0	81	0	0	0	82
Nome	25	19	0	469	13	0	1	484
Noorvik	4	2	0	47	1	0	0	49
North Pole	180	149	2	3,268	63	3	22	3,358
Nuiqsut	1	0	0	11	0	0	0	12
Nulato	1	0	0	11	0	0	0	12
Peters Creek	1	1	0	0	0	0	0	0
Petersburg	1	1	0	19	0	0	0	19
Point Hope	2	1	0	11	55	0	0	67
Port Alsworth	2	1	0	44	0	0	0	45
Port Heiden	1	1	0	35	0	0	0	35
Port Lions	1	1	0	35	0	0	0	35
Quinhagak	1	1	0	12	0	0	0	12
Saint Michael	2	0	0	22	1	0	0	24
Saint Michael	1	0	0	11	0	0	0	12
Saint Paul Island	3	1	0	67	1	0	0	69
Salcha	4	2	0	56	1	0	0	58
Sand Point	1	0	0	11	0	0	0	12
Savoonga	1	1	0	0	0	0	0	0
Selawik	3	2	0	12	0	0	0	13
Shishmaref	1	1	0	8	0	0	0	8
Shungnak	1	1	0	0	0	0	0	0
Sitka	12	11	0	134	0	0	0	135
Skagway	1	1	0	0	0	0	0	0
Skwentna	2	2	0	25	0	0	0	25
Stebbins	1	0	0	11	0	0	0	12
Teller	1	1	0	5	0	0	0	5
Togiak	1	1	0	0	0	0	0	0
Tok	8	5	0	105	2	0	1	108
Toksook Bay	1	1	0	0	0	0	0	0
Tuntutuliak	1	1	0	2	0	0	0	2
Two Rivers	2	2	0	35	0	0	0	35
Unalakleet	7	3	0	111	1	0	1	114
Unalaska	3	2	0	42	0	0	0	43
Valdez	19	13	0	274	15	0	1	291
Wainwright	1	1	0	2	0	0	0	2
Whittier	9	8	0	46	0	0	0	47
Wiseman	1	0	0	11	0	0	0	12
Wrangell	4	3	0	51	0	0	0	52

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Table 11-14.–Page 4 of 4.

Community	Permits Issued	Permits Returned	Estimated salmon harvest Chinook	Sockeye	Coho	Chum	Pink	Total
Subtotal, other Alaska	**1,350**	**1,028**	**4**	**21,874**	**580**	**35**	**204**	**22,696**
Other USA	4	4	0	104	0	0	1	105
Unknown Communities	458	174	2	5,531	155	50	79	5,817
Total	**34,920**	**27,119**	**127**	**521,985**	**10,648**	**1,926**	**7,257**	**541,942**

Source ADF&G Division of Sport Fish

Note Includes Kasilof River setnet fishery, Kasilof River dip net fishery, Kenai River dip net fishery, Fish Creek (Knik Arm) dip net fishery and unknown fishery.

Table 11-15.–Estimated personal use salmon harvests, Kasilof River setnet fishery, 1982–2015.

Year[a]	Permits Total	Permits Returned	Estimated salmon harvest Chinook	Sockeye	Coho	Chum	Pink	Total
1982	649	NA	372	7,543	24	NA	17	7,956
1983	684	NA	307	8,846	NA	NA	NA	9,153
1984	698	NA	165	12,926	NA	NA	NA	13,091
1985	692	NA	203	10,746	NA	NA	NA	10,949
1986	NA	NA	168	9,609	NA	NA	NA	9,777
1987	NA	NA	184	9,375	NA	NA	NA	9,559
1988	NA	NA	118	9,803	NA	NA	NA	9,921
1989	NA	NA	186	9,928	NA	NA	NA	10,114
1990	NA	NA	133	7,123	NA	NA	NA	7,256
1991[b]	NA	NA	34	8,380	NA	NA	NA	8,414
1992	--	--	--	--	--	--	--	--
1993	NA	NA	47	7,942	NA	NA	NA	7,989
1994	--	--	--	--	--	--	--	--
1995	--	--	--	--	--	--	--	--
1996[c]	NA	NA	46	9,506	0	1	8	9,561
1997	NA	NA	65	17,997	1	3	102	18,168
1998	NA	NA	126	15,975	0	12	15	16,128
1999	NA	NA	442	12,832	25	10	10	13,319
2000	NA	NA	514	14,774	9	10	17	15,324
2001	NA	NA	174	17,201	6	7	11	17,399
2002	NA	NA	192	17,980	12	13	30	18,227
2003	NA	NA	400	15,706	107	4	9	16,226
2004	NA	NA	163	25,417	58	0	6	25,644
2005	NA	NA	87	26,609	326	1	16	27,039
2006	NA	NA	287	28,867	420	6	11	29,591
2007	NA	NA	343	14,943	68	0	2	15,356
2008	NA	NA	151	23,432	65	23	35	23,706
2009	NA	NA	127	26,646	165	11	14	26,963
2010	NA	NA	136	21,924	23	1	23	22,107

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Table 11-15.–Page 2 of 2

Year[a]	Permits		Estimated salmon harvest					
	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2011	NA	NA	167	26,780	47	3	23	27,020
2012	NA	NA	103	15,638	161	15	53	15,970
2013	NA	NA	46	14,439	129	5	3	14,622
2014	NA	NA	50	22,567	30	18	105	22,770
2015	NA	NA	61	27,567	191	2	20	27,841
5-year average (2010–2014)	NA	NA	100	20,270	78	8	41	20,498
10-year average (2005–2014)	NA	NA	150	22,185	143	8	29	22,514
Historical average (1996–2014)[d]	NA	NA	190	19,433	87	8	26	19,744

Source Ruesch and Fox (1996) for 1982–1995; Division of Sport Fish for 1996–2015.

a. The fishery was closed 1992, 1994, and 1995.

b. This fishery was administered separately from the subsistence setnet fisheries that operated in 1991 (Ruesch and Fox 1992).

c. Current regulations in place since 1996. Permits since 1996 issued for 4 Upper Cook Inlet personal use salmon fisheries.

d. Historical average based on years since 1996 when current regulations were adopted.

Table 11-16.–Estimated personal use salmon harvests, Kasilof River dip net fishery, 1981–2015.

Year[b]	Permits		Estimated salmon harvest[a]					
	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1981	NA	NA	NA	10,300	NA	NA	NA	10,300
1982	NA	NA	NA	1,800	NA	NA	NA	1,800
1983	NA	NA	NA	11,124	NA	NA	NA	11,124
1984	NA	NA	NA	12,771	NA	NA	NA	12,771
1985	NA	NA	NA	16,284	NA	NA	NA	16,284
1986	NA	NA	NA	38,674	NA	NA	NA	38,674
1987	NA	NA	NA	18,454	NA	NA	NA	18,454
1988	NA	NA	NA	3,547	NA	NA	NA	3,547
1989	--	--	--	--	--	--	--	--
1990	--	--	--	--	--	--	--	--
1991[cd]	7,065	5,480	10	907	2	0	3	922
1992	9,500	4,104	24	1,230	24	0	3	1,281
1993	--	--	--	--	--	--	--	--
1994[e]	10,127	4,823	54	6,414	137	14	59	6,678
1995	NA	NA	NA	4,160	NA	NA	NA	4,160
1996[f]	NA	NA	50	11,197	334	17	103	11,701
1997	NA	NA	35	9,737	90	19	19	9,900
1998	NA	NA	134	45,161	731	74	610	46,710
1999	NA	NA	127	37,176	286	52	264	37,905
2000	NA	NA	134	23,877	1,004	34	841	25,890

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Table 11-16.–Page 2 of 2.

Year[b]	Permits		Estimated salmon harvest[a]					
	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2001	NA	NA	138	37,612	766	23	307	38,846
2002	NA	NA	106	46,769	1197	139	1862	50,073
2003	NA	NA	57	43,870	592	30	286	44,835
2004	NA	NA	44	48,315	668	90	396	49,513
2005	NA	NA	16	43,151	538	102	658	44,465
2006	NA	NA	55	56,144	1,057	105	992	58,353
2007	NA	NA	35	43,293	487	136	383	44,334
2008	NA	NA	46	54,051	509	143	787	55,536
2009	NA	NA	34	73,035	1,441	173	1,274	75,957
2010	NA	NA	31	70,774	1,768	279	974	73,826
2011	NA	NA	24	49,766	977	144	652	51,563
2012	NA	NA	16	73,419	1170	147	896	75,648
2013	NA	NA	18	85,528	1,666	339	683	88,234
2014	NA	NA	0	88,513	2,606	342	2,769	94,230
2015	NA	NA	0	89,000	2,723	597	1,607	93,927
5-year average (2010–2014)	NA	NA	18	73,600	1,637	250	1,195	76,700
10-year average (2005–2014)	NA	NA	28	63,767	1,222	191	1,007	66,215
Historical average (1996–2014)[g]	NA	NA	58	49,547	941	126	777	51,448

Source Nelson et al. (1999) for 1981–1990 and 1993-1995; Brannian and Fox (1996) for 1991, 1992, and 1994; Division of Sport Fish for 1996–2015.

a. Personal use harvests are estimated based on the annual sport harvest survey conducted by the Division of Sport Fish prior to 1996, and are estimated based on permit returns since 1996. Only sockeye salmon harvests reported, 1981–1990.

b. Fishery closed 1989–1990, and 1993. Classified as a subsistence fishery in 1991 and 1992.

c. In 1991, 1992, and 1994, a single permit issued for all Upper Cook Inlet subsistence fisheries except Tyonek (central dip net, central setnet, northern setnet) (Brannian and Fox 1996). Permit return rate for 1992 was approximately 43.2% (Ruesch and Fox 1993).

d. Harvests for 1991 and 1992, and subsistence harvests for 1994, are reported, not estimated.

e. In 1994 both a subsistence and a personal use dip net fishery took place in the Kasilof River (Nelson 1999). Sockeye harvests included 3,679 salmon in the personal use fishery and 2,735 salmon in the subsistence fishery. Harvest data for other species in the personal use fishery are not available.

f. Current regulations have been in place since 1996. Permits have been required since 1996 and are issued for 4 Upper Cook Inlet personal use fisheries.

g. Historical average based on years since 1996 when current regulations were adopted.

NA = Data not available.

Table 11-17.–Estimated personal use salmon harvests, Kenai River dip net fishery, 1981–2015.

Year[b]	Permits		Estimated salmon harvest[a]					
	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1981	–	–	–	–	–	–	–	–
1982[c]	NA	NA	NA	NA	NA	NA	NA	0
1983	NA	NA	NA	7,562	NA	NA	NA	7,562
1984	–	–	–	–	–	–	–	–
1985	–	–	–	–	–	–	–	–
1986	–	–	–	–	–	–	–	–
1987	NA	NA	NA	24,086	NA	NA	NA	24,086
1988	NA	NA	NA	16,880	NA	NA	NA	16,880
1989	NA	NA	NA	48,976	NA	NA	NA	48,976
1990	–	–	–	–	–	–	–	–
1991[de]	7,065	5,480	44	10,468	146	2	17	10,677
1992[f]	9,500	4,104	158	28,429	1,475	74	598	30,734
1993	NA	NA	NA	33,467	NA	NA	NA	33,467
1994	10,127	4,823	187	13,897	2,535	114	1,263	17,996
1995	NA	NA	NA	14,352	NA	NA	NA	14,352
1996[g]	NA	NA	295	102,821	1,932	175	2,404	107,627
1997	NA	NA	364	114,619	559	58	619	116,219
1998	NA	NA	254	103,847	1,011	85	1,032	106,229
1999	NA	NA	488	149,504	1,009	102	1,666	152,769
2000	NA	NA	410	98,262	1,449	193	1,457	101,771
2001	NA	NA	638	150,766	1,555	155	1,326	154,440
2002	NA	NA	606	180,028	1,721	551	5,662	188,568
2003	NA	NA	1,016	223,580	1,332	249	1,647	227,824
2004	NA	NA	792	262,831	2,661	387	2,103	268,774
2005	NA	NA	997	295,496	2,512	321	1,806	301,132
2006	NA	NA	1,034	127,630	2,235	551	11,127	142,577
2007	NA	NA	1,509	291,270	2,111	472	1,939	297,301
2008	NA	NA	1,362	234,109	2,609	504	10,631	249,215
2009	NA	NA	1,189	339,993	2,401	285	5,482	349,350
2010	NA	NA	865	389,552	2,870	508	3,655	397,450
2011	NA	NA	1,243	537,765	4,745	915	3,914	548,582
2012	NA	NA	40	526,992	4,008	425	3,770	535,235
2013	NA	NA	11	347,222	3,169	701	3,625	354,728
2014	NA	NA	0	379,823	4,710	1,194	19,140	404,867
2015	NA	NA	66	377,532	4,150	957	4,147	386,852
5-year average (2010–2014)	NA	NA	432	436,271	3,900	749	6,821	448,172
10-year average (2005–2014)	NA	NA	825	346,985	3,137	588	6,509	358,044
Historical average (1996–2014)[h]	NA	NA	690	255,585	2,347	412	4,369	263,403

Source Nelson et al. (1999) for 1981–1990 and 1993–1995; Brannian and Fox (1996) for 1991, 1992, and 1994; Division of Sport Fish for 1996–2015.

a. Personal use harvests are estimated based on the annual sport harvest survey conducted by the Division of Sport Fish prior to 1996, and are estimated based on permit returns since 1996. Only sockeye salmon harvests reported, 1981–1990.

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b. Fishery closed 1981, 1984–1986, and 1990. Classified as a subsistence fishery in 1991, a portion of 1992 and 1994.

c. The 1982 harvest is reported as "unknown" but "insignificant" (Nelson 1999; Brannian and Fox 1996).

d. Subsistence harvests for 1991, 1992, and 1994 are reported, not estimated.

e. 1991, 1992, and 1994 permits: single permit issued for all Upper Cook Inlet subsistence fisheries except Tyonek.

f. Harvests for 1992 include 16,240 sockeye salmon in the subsistence fishery and 12,189 sockeye in the personal use fishery. Harvests for other species are for the subsistence fishery only. Personal use harvests are not available for the other species.

g. Current regulations have been in place since 1996. Permits have been required since 1996 and are issued for 4 Upper Cook Inlet personal use fisheries.

h. Historical average based on years since 1996 when current regulations were adopted.

NA = Data not available.

Table 11-18.–Estimated personal use salmon harvests, Fish Creek dip net fishery, 1987–2015.

	Permits		Estimated salmon harvest[a]					
Year[b]	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1987	NA	NA	0	2,200	0	0	2,200	4,400
1988	NA	NA	0	3,000	0	0	3,000	6,000
1989	NA	NA	0	5,000	0	0	5,000	10,000
1990	NA	NA	0	6,500	0	0	6,500	13,000
1991	NA	NA	0	14,369	0	549	567	15,485
1992	NA	NA	0	19,002	0	607	678	20,287
1993	NA	NA	0	37,224	973	503	2,068	40,768
1994	NA	NA	0	16,012	1,336	248	632	18,228
1995	NA	NA	0	9,102	2,640	99	290	12,131
1996	NA	NA	37	17,260	2,414	153	331	20,195
1997	NA	NA	0	3,277	63	4	53	3,397
1998	NA	NA	1	4,036	649	29	80	4,795
1999	NA	NA	0	1,083	17	0	12	1,112
2000	NA	NA	0	6,925	958	29	83	7,995
2001	NA	NA	0	436	18	1	2	457
2002	--	--	--	--	--	--	--	--
2003	--	--	--	--	--	--	--	--
2004	--	--	--	--	--	--	--	--
2005	--	--	--	--	--	--	--	--
2006	--	--	--	--	--	--	--	--
2007	--	--	--	--	--	--	--	--
2008	--	--	--	--	--	--	--	--
2009	NA	NA	10	9,898	53	33	66	10,060
2010	NA	NA	12	23,705	3,576	290	1,721	29,304
2011	NA	NA	2	5,236	905	72	155	6,370
2012	--	--	--	--	--	--	--	--
2013	--	--	--	--	--	--	--	--
2014	NA	NA	0	5,829	1,895	227	4,218	12,169
2015	NA	NA	0	19,260	3,321	329	1,329	24,239
Historical average (1996–2014)	NA	NA	6	7,769	1,055	84	672	9,585

Source Brannian and Fox (1996) for 1987–1994; Howe et al. (1996) for 1995; Division of Sport Fish for 1996–2011 and 2014.

a. Estimates derived from statewide sport harvest survey prior to 1996. Permits required since 1996.

b. Fishery closed 2002 through 2008, 2012, and 2013.

Table 11-19.–Estimated salmon harvests, unknown Upper Cook Inlet personal use fishery, 1996–2015

	Permits		Estimated salmon harvest					
Year	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1996	NA	NA	24	4,761	131	4	127	5,047
1997	NA	NA	0	3,310	64	4	51	3,429
1998	NA	NA	34	7,562	294	20	196	8,106
1999	NA	NA	51	7,994	76	4	126	8,251
2000	NA	NA	44	5,429	218	24	84	5,799
2001	NA	NA	188	12,673	292	90	175	13,418
2002	NA	NA	166	14,846	341	54	916	16,323
2003	NA	NA	238	15,675	219	88	140	16,360
2004	NA	NA	99	13,527	366	25	210	14,227
2005	NA	NA	32	4,520	39	4	40	4,635
2006	NA	NA	29	3,406	47	84	304	3,870
2007	NA	NA	37	6,729	61	6	28	6,861
2008	NA	NA	41	6,890	66	58	412	7,467
2009	NA	NA	25	7,968	144	57	133	8,327
2010	NA	NA	15	8,300	168	12	109	8,604
2011	NA	NA	17	10,695	80	35	135	10,962
2012	NA	NA	8	13,548	173	40	135	13,904
2013	NA	NA	9	7,126	155	8	113	7,411
2014	NA	NA	0	9,315	129	78	563	10,085
2015	NA	NA	0	8,626	263	41	153	9,083
5-year average (2010–2014)	NA	NA	10	9,797	141	35	211	10,193
10-year average (2005–2014)	NA	NA	21	7,850	106	38	197	8,213
Historical average (1996–2014)	NA	NA	56	8,646	161	37	210	9,110

Source ADF&G Division of Sport Fish.

Table 11-20.–Beluga River senior personal use dip net fishery summary, 2008–2015.

	Permits		Reported salmon harvest					
Year	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2008	20	20	0	31	35	0	0	66
2009	11	11	0	140	78	0	7	225
2010	14	14	0	47	1	5	0	53
2011	13	12	0	137	17	5	0	159
2012	7	7	0	9	7	0	0	16
2013	8	8	0	30	55	1	2	88
2014	10	10	0	32	12	1	1	46
2015	8	8	0	65	17	0	0	82
Historical average (2008–2014)	12	12	0	61	29	2	1	93

Source ADF&G Division of Sport Fish.

Table 11-21.–Personal use/subsistence salmon harvests, Kachemak Bay setnet fishery (excluding the Port Graham/Nanwalek subsistence fishery and the Seldovia subsistence fishery), Lower Cook Inlet, 1969–2015.

	Households or permits		Reported salmon harvest					
Year	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1969	47	44	0	9	752	0	38	799
1970	78	73	0	12	1,179	13	143	1,347
1971	112	95	2	16	1,549	7	44	1,618
1972	135	105	1	11	975	69	48	1,104
1973	143	128	0	18	1,304	40	84	1,446
1974	148	118	0	16	376	77	43	512
1975	292	276	4	47	1,960	61	632	2,704
1976	242	221	16	46	1,962	56	1,513	3,593
1977	197	179	12	46	2,216	119	639	3,032
1978	311	264	4	35	2,482	34	595	3,150
1979	437	401	6	37	2,118	41	2,251	4,453
1980	533	494	43	32	3,491	25	1,021	4,612
1981	403	383	15	73	4,370	68	718	5,244
1982	395	372	41	49	7,398	154	956	8,598
1983	344	328	5	17	2,701	44	305	3,072
1984	368	346	3	25	3,639	105	804	4,576
1985	328	302	5	49	3,317	34	138	3,543
1986	349	310	7	68	3,831	56	3,132	7,094
1987	363	339	5	50	3,979	61	279	4,374
1988	439	417	14	73	5,007	75	1,445	6,614
1989	477	453	41	156	7,219	53	883	8,352
1990	578	543	12	200	8,323	69	1,846	10,450
1991	472	459	8	47	4,931	23	366	5,375
1992	365	350	5	63	2,277	21	643	3,009
1993	326	317	6	44	1,992	18	463	2,523
1994	286	284	66	80	4,097	18	1,178	5,439
1995	235	232	118	108	2,916	7	343	3,492
1996	299	293	302	102	3,347	24	1,022	4,797
1997	276	264	384	191	1,817	12	257	2,661
1998	227	214	135	20	1,461	5	167	1,788
1999	146	141	276	119	1,803	3	168	2,369
2000	213	206	104	28	2,064	4	304	2,504
2001	154	148	86	27	1,579	16	150	1,858
2002	122	113	61	33	1,521	12	251	1,878
2003	104	96	17	57	1,071	9	170	1,324
2004	91	83	7	56	1,554	16	172	1,805
2005	108	96	8	57	833	13	296	1,207
2006	89	82	15	41	1,295	5	221	1,577
2007	141	133	10	113	1,431	34	641	2,229
2008	146	142	2	92	1,844	14	687	2,639
2009	145	142	9	273	646	4	101	1,033
2010	128	122	14	149	875	17	251	1,306
2011	119	112	15	223	806	5	145	1,194

-continued-

Table 11-21.–Page 2 of 2.

Year	Households or permits		Reported salmon harvest					
	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2012	98	95	5	137	1,471	6	275	1,894
2013	123	118	9	122	1,732	3	135	2,001
2014	160	154	13	310	2,273	178	20	2,794
2015	136	131	10	509	1,373	22	152	2,066
5-year average (2010–2014)	126	120	11	188	1,431	42	165	1,838
10-year average (2005–2014)	126	120	10	152	1,321	28	277	1,787
Historical average (1969–2014)	245	230	42	78	2,517	38	565	3,239

Source Hallowell et al. (2016).

Table 11-22.–Estimated personal use salmon harvests, China Poot dip net fishery, 1980–1995.

Year	Fishers	Estimated salmon harvest					
		Chinook	Sockeye	Coho	Chum	Pink	Total
1980	NA	0	1,000	0	0	0	1,000
1981[a]	--	--	--	--	--	--	--
1982	NA	0	1,320	0	0	0	1,320
1983	1,956	0	5,910	0	0	0	5,910
1984	1,237	0	1,794	0	0	0	1,794
1985	398	0	794	0	0	12	806
1986	993	0	1,815	0	0	673	2,488
1987	1,016	0	1,231	0	0	0	1,231
1988	1,361	0	1,910	0	127	36	2,073
1989	1,428	0	5,416	0	0	239	5,655
1990	1,537	0	5,835	0	178	68	6,081
1991	395	0	1,528	0	0	33	1,561
1992	810	0	3,468	0	76	183	3,727
1993	1,036	0	4,260	0	0	45	4,305
1994	1,372	0	5,715	0	0	34	5,749
1995[b]	2,261	0	8,605	0	0	77	8,682
Historical average (1980–1995)	1,215	0	3,373	0	25	93	3,492

Source Fall and Stanek (1990), for 1980 to 1989, based on annual reports of the sport fish harvest survey. 1990 through 1995: annual sport fish angler survey report. Harvest data as reported in annual sport fish angler survey reports differ from data reported in Nelson (1995:222), which reports "sport and personal use harvests combined."

a. Fishery was closed in 1981.

b. Harvest data not collected after 1995.

NA = Data not available.

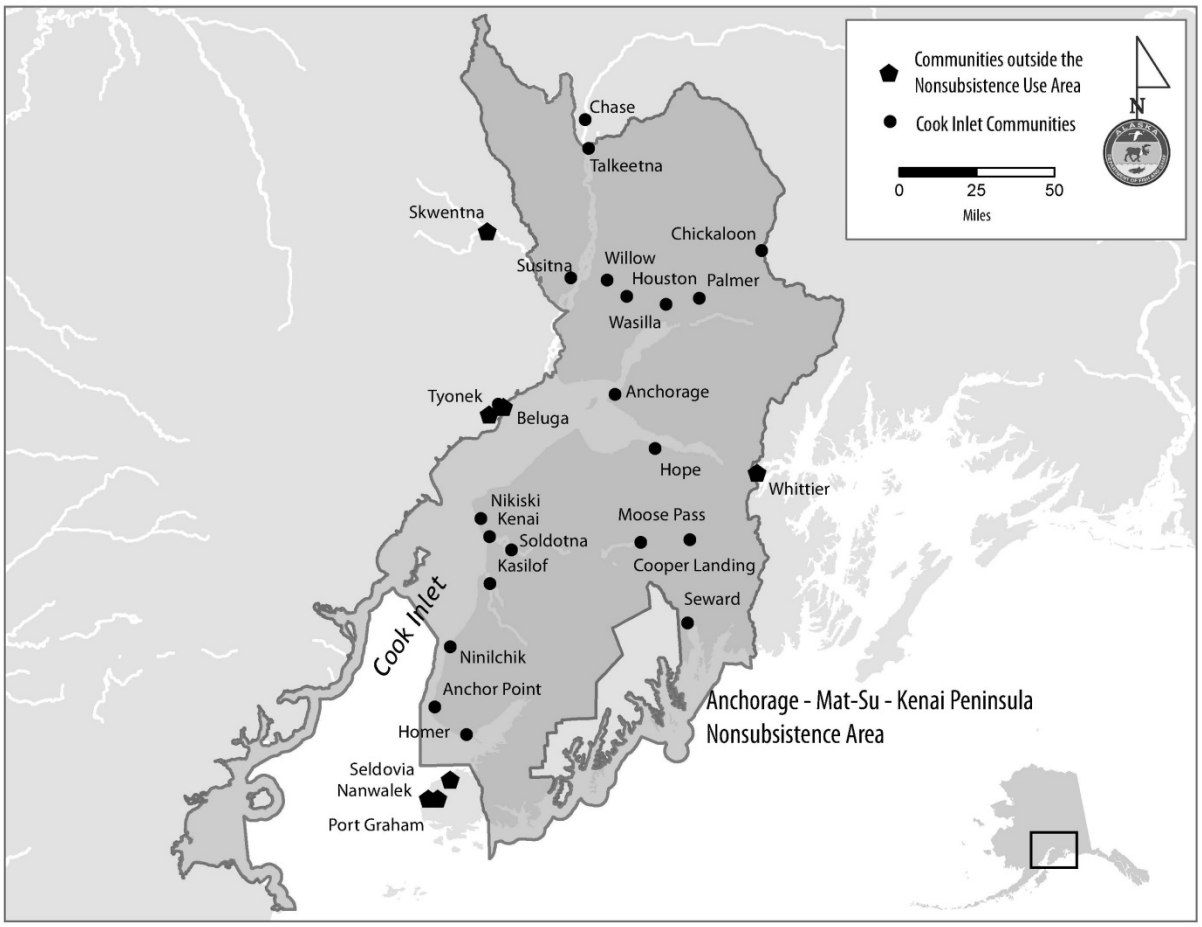

Figure 11-1.–Anchorage–Matsu–Kenai Nonsubsistence Area map.

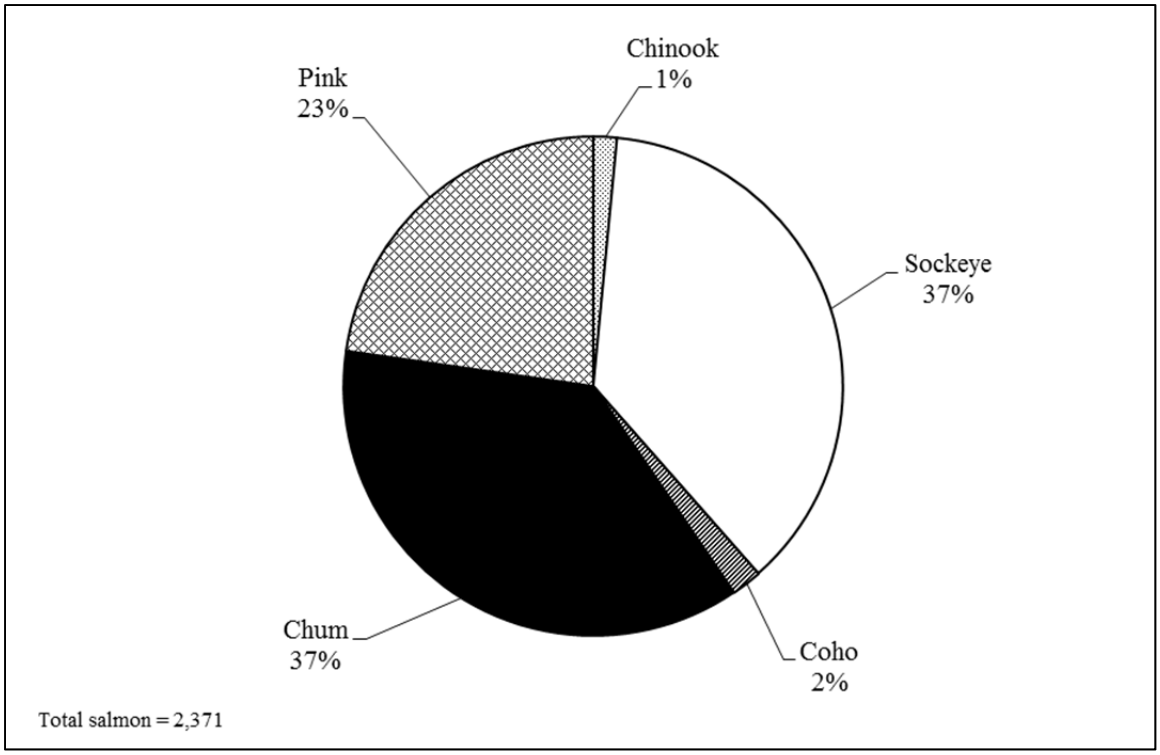

Figure 11-2.–Subsistence salmon harvests in the Port Graham and Koyuktolik subdistricts, 2015.

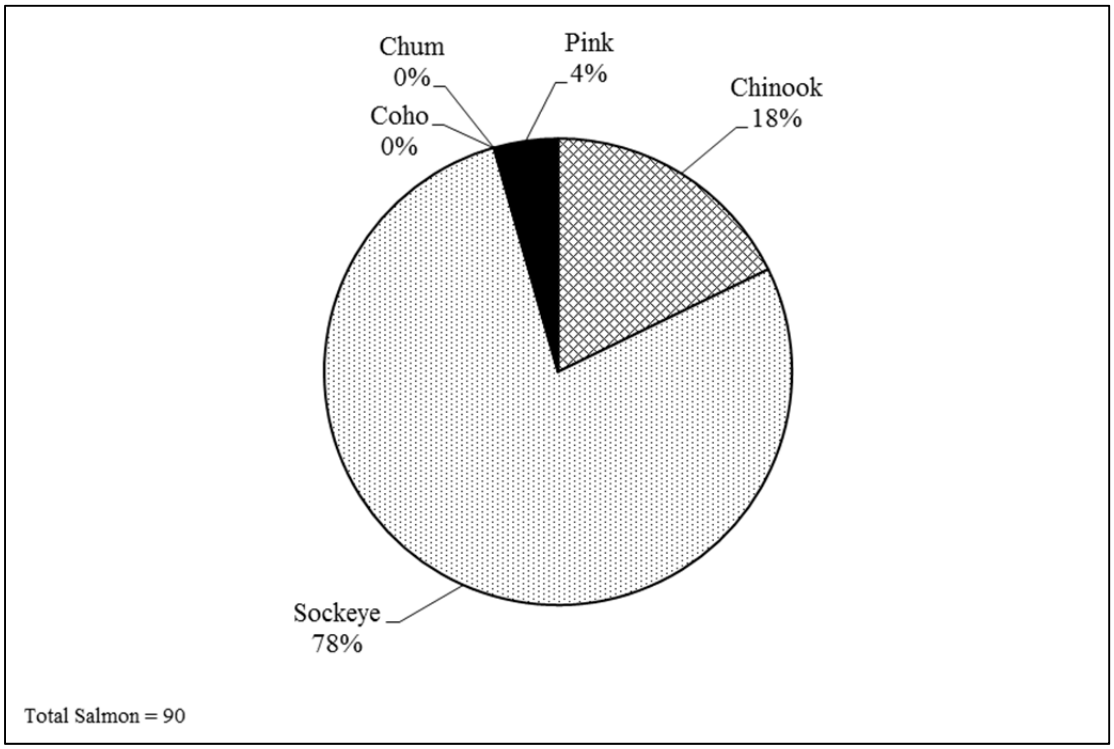

Figure 11-3.–Subsistence salmon harvests in Seldovia, 2015.

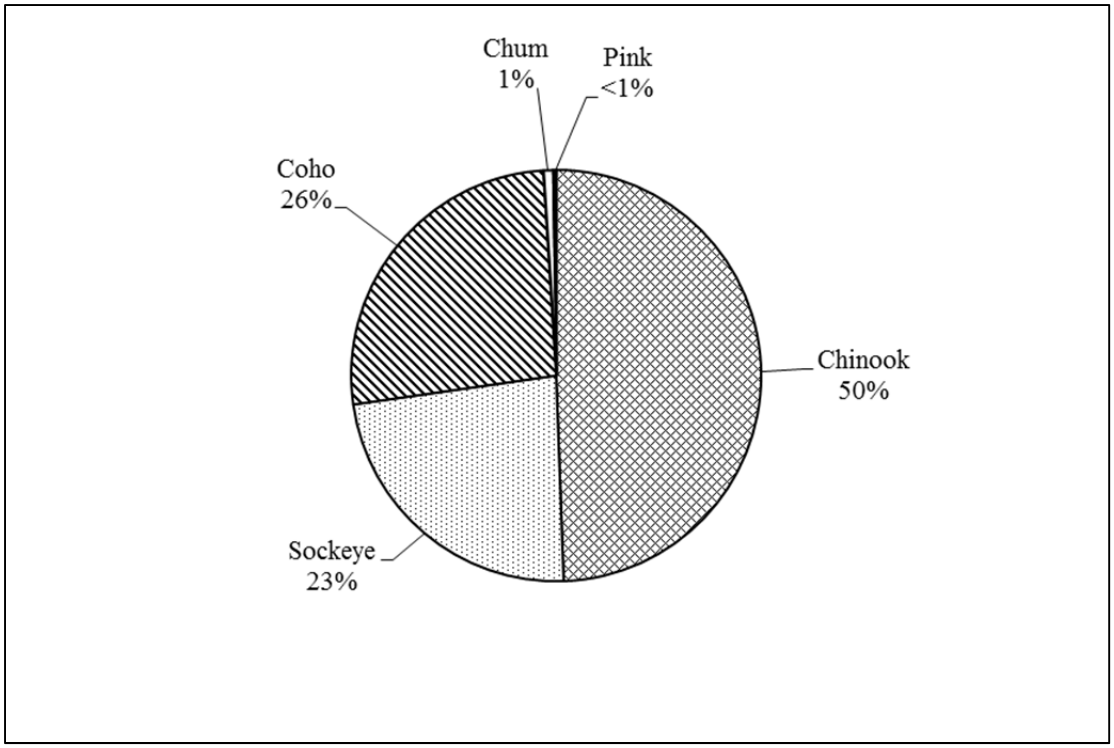

Figure 11-4.–Subsistence salmon harvests in the Tyonek Subdistrict, 2015.

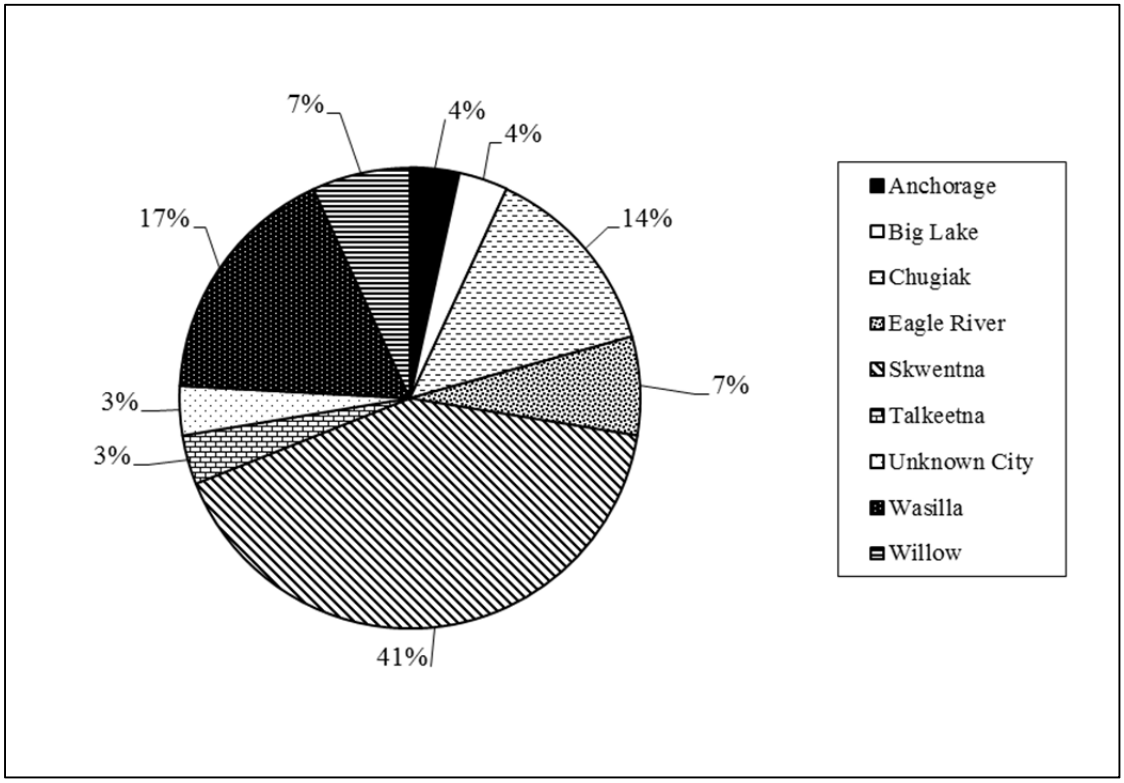

Figure 11-5.–Permits issued, by place of residence, for the Upper Yentna River fishery, 2015.

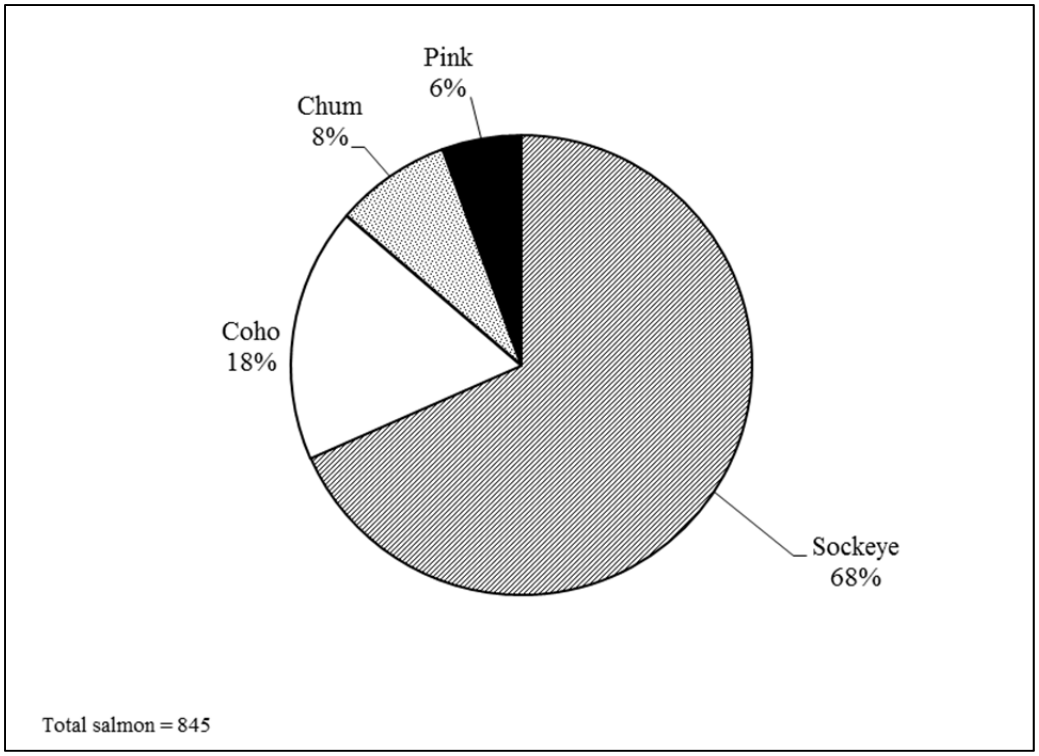

Figure 11-6.–Subsistence salmon harvests in the Upper Yentna River, 2015.

CHAPTER 12: PRINCE WILLIAM SOUND AREA

INTRODUCTION

The Prince William Sound (PWS) Management Area includes all waters of the Gulf of Alaska between the longitude of Cape Fairfield and the longitude of Cape Suckling south of the Yukon Area described in 5 AAC 05.100, and all waters of the Upper Susitna River drainage upstream of the Susitna River's confluence with the Oshetna River. The PWS Management Area's main geographical features are the Copper River, its tributaries, and Prince William Sound. It has a total land area of 38,000 square miles.

The topography of the large and complex Prince William Sound system creates ecological conditions that support many salmon runs. The area supports both natural and enhanced runs of pink *Onchorhynchus gorbuscha*, sockeye *O. nerka*, chum *O. keta*, coho *O. kisutch*, and Chinook *O. tshawytscha* salmon.

State managed personal use and state and federal subsistence fisheries within these waters provide salmon to households within the Copper River Basin, Prince William Sound, and other communities across Alaska. Subsistence fisheries are not permitted in the Valdez Nonsubsistence Area (5 AAC 99.015(a)(5)). In 2015, approximately 14,946 personal use and subsistence permits for the Prince William Sound Management Area were issued to Alaska residents, with a total estimated harvest of 355,411salmon.

In addition to subsistence and personal use fisheries, the area supports commercial gillnet and purse seine fisheries, as well as sport fisheries for all salmon types. Six hatcheries run by nonprofit aquaculture associations contribute pink, sockeye, and chum salmon to the area's fisheries. The Gulkana Hatchery in Paxson augments production of sockeye salmon to the Copper River.

In 2015 there were 8 subsistence and 1 personal use fisheries with annual harvest assessment programs in the Prince William Sound Management Area:

In the Upper Copper River:

- Glennallen Subdistrict: state subsistence permit program,
- Glennallen Subdistrict: federal subsistence permit program
- Chitina Subdistrict: state personal use permit program,
- Chitina Subdistrict: federal subsistence permit program,
- Batzulnetas: federal subsistence permit program,

In Copper River Flats–Prince William Sound: state subsistence permit program

In Prince William Sound's waters:

- Eastern District–Tatitlek: state subsistence permit program
- Southwestern District–Chenega Bay: state subsistence permit program, and
- Prince William Sound, general area: state subsistence permit program.
- PWS/Chugach National Forest federal subsistence permit program

The Upper Copper River area is accessible by the Richardson Highway and the Glenn Highway. The Copper River Delta and communities along the Prince William Sound shoreline are accessible primarily via boat or plane, with the exception of Valdez, which is also accessible by the Richardson Highway. Besides Copper River and PWS communities, other communities show a high amount of use of some of the PWS fisheries, including Anchorage, Fairbanks, Palmer, and Wasilla.

The 20 communities of the Copper River Basin range from fewer than 15 people to over 450 and had a total 2015 population of approximately 2,800 people.[1] Fewer communities are situated along the coastline of the Prince William Sound Management Area than in the Copper River Basin. These communities range in size from Valdez and Cordova (2015 population estimates of 4,007 and 2,339 residents, respectively) to Whittier (252 residents), Tatitlek (98 residents) and Chenega Bay (60 residents).[2]

HARVEST ASSESSMENT PROGRAMS

Annual subsistence-personal use salmon harvest assessments have been conducted in the PWS Management Area since at least 1960, conducted by either the Division of Commercial Fisheries or Division of Sport Fish for the state-managed fisheries. Harvest assessment programs for the federal subsistence fisheries in the Upper Copper River are administered by the National Park Service. For both state and federal subsistence and personal use fisheries, the harvest assessment program is based on required fishing permits. Permits include harvest reports and fishers are required to record at least the dates they fished and the number of each species harvested each day. Other standard permit conditions include prohibition of fishing within 300 ft. of a dam, fish ladder, weir, culvert, or other artificial obstruction. Any specific permit requirements for each fishery are detailed in the relevant sections below. Harvest estimates for the fisheries are made based on reported harvests expanded to all permit holders.

UPPER COPPER RIVER DISTRICT

For both state and federal management purposes, the Upper Copper River District of the Prince William Sound Management Area consists of all waters of the mainstem Copper River from the mouth of the Slana River downstream to an east–west line crossing the Copper River approximately 200 yards upstream of Haley Creek as designated by ADF&G regulatory markers. There are 2 subdistricts: the Chitina Subdistrict, which consists of all waters of the Upper Copper River District downstream of the downstream edge of the Chitina–McCarthy Road Bridge, and the Glennallen Subdistrict, which consists of all remaining waters of the Upper Copper River District. All tributaries to the Copper River are closed to subsistence salmon fishing. The state also created the Batzulnetas fishery in 1987 through an emergency regulation to settle the federal district court case of *John vs. Alaska*. There is currently a federal permit program for a federal fishery in this area.

The state established the Glennallen and Chitina subdistricts in 1977. Prior to that time, the Upper Copper River was treated as one unit for management purposes. In 2002, the FSB created a federal permit requirement for qualified rural residents (primarily residents of Copper River Basin and Upper Tanana communities), which is administered by the National Park Service (NPS). The Glennallen and Chitina subdistricts have had separate state and federal permit programs since 2002. The personal use dip net fishery that takes place in the Chitina Subdistrict under state regulations has in the past been classified as either subsistence or personal use. Historical data for this fishery, including years when it was classified as subsistence, are included in statewide summaries as personal use. For a detailed discussion of the history of these fisheries, see Simeone and Fall (1996).

The creation of a dual permit program for subsistence fishing in the Upper Copper River (Glennallen Subdistrict) creates challenges for the compilation of a single subsistence harvest estimate for this subsistence fishery, which is the goal of this annual report. Issues include the following:

- federal permits allow fishing with multiple gear types, including rod and reel, but state permits allow fishing with only 2 gear types—dip nets or fish wheels. Thus while prior to 2003, annual report summaries for the Glennallen Subdistrict showed the number of permits issued by gear type, this is not possible for the combined state and federal data summaries reported here.

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 9, 2016. http://live.laborstats.alaska.gov/pop/index.cfm
2. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 9, 2016. http://live.laborstats.alaska.gov/pop/index.cfm

Some households obtain both the state and federal permit for the Glennallen Subdistrict. Of these "dual-permitted" households, some report harvest and effort only on their state permits (not returning the federal permit), some report harvest and effort only on their federal permits (not returning the state permit), some report identical harvests and efforts on both permits, and some return neither permit. Editing the data to compensate for double-reporting of salmon harvest and effort requires 2 assumptions: 1) permittees returning only 1 permit did not record harvest or effort on the other, and 2) permittees reporting identical harvests and efforts on both permits recorded identical harvests twice rather than split their harvests between permits. These assumptions were employed in the analysis only after discussing the dual-permitted households with the program administrators in the Division of Sport Fish and NPS. All households obtaining both state and federal permits were counted as receiving only 1 permit in the summary tables for the Glennallen Subdistrict included here.

Until 2006, state permits collected only the permit holder's city in terms of their mailing address, but federal permits collected this and the "community of primary residence." Since the Copper River area has a number of smaller communities without their own post offices, state permits issued to residents of these communities prior to 2006 did not provide adequate information to assure analysis results accurately reflect the true community of residency of harvesters. But because of the precision of the federal permit regarding place of residence, the federal permit place of residence data were used to compile the harvest tables, in combination with the mailing address data from state permits. Since there were several dual-permitted households in the Glennallen Subdistrict fishery, the federal residence community was used as the default where this information differed.

Glennallen Subdistrict State and Federal Subsistence Fisheries

Regulations

The Glennallen Subdistrict is that portion of the mainstem Copper River upstream of the McCarthy Bridge to the mouth of the Slana River. The BOF has found that all waters of the Glennallen Subdistrict sustain customary and traditional uses of salmon and other fish.

ADF&G issues state permits at ADF&G offices (in Glennallen, Tok, Delta Junction, Fairbanks, Palmer, and Anchorage) under the authority of 5 AAC 01.630. Federal permits can be applied for in person at the NPS Wrangell-St. Elias Visitor's Center in Copper Center or the Slana Ranger Station.

In the state fishery, households may participate in either the Glennallen Subdistrict subsistence fishery or the Chitina Subdistrict personal use fishery in any given year, but not both. In the Glennallen Subdistrict, fishers may use either fish wheels or dip nets, but not both. Federally-qualified rural resident households may hold permits for both the federal and state Glennallen Subdistrict subsistence fisheries, or for the federal Glennallen fishery and the Chitina state personal use fishery or the Chitina federal subsistence fishery, but state and federal harvest limits are not additive. Federal subsistence permit holders may use rod and reel in addition to fish wheels and dip nets; all 3 types of gear may be used, but not at the same time. Under federal regulations, the total number of salmon per household taken within the Upper Copper River District exchanged in customary trade may not exceed 50% of the annual harvest limit per household and may not exceed the total cash value of $500 annually. State regulations for the district do not allow exchange of subsistence-caught fish for cash.

The state season is June 1–September 30; the federal season is May 15–September 30. Annual limits are the same under state and federal regulations: 30 salmon for a household with 1 person or 60 salmon for a household of 2 persons, of which no more than 5 may be Chinook salmon if taken with a dip net. For a household of more than 2, 10 salmon for each additional person may be added to the annual limit. Upon request, permits can be issued for additional salmon, with limits of 200 salmon for 1-person households and 500 for households of 2 or more persons. The number of Chinook salmon (5) taken by dip net does

not increase with household size under state regulations; federal permit holders may take up to 5 additional Chinook salmon with rod and reel.

Under the provisions of 5 AAC 01.630 (h), a village council or other similarly qualified organization may obtain a permit to operate a fish wheel on behalf of its members upon approval of a harvest assessment plan submitted to ADF&G. These organizations may also issue household permits and register fish wheels. Since 1997 permits have been issued to tribal organizations from Chistochina, Gakona, Kluti-Kaah, Chickaloon, and Chitina. Table 12-1 summarizes data for the permits issued for village fish wheels by ADF&G from 1997 through 2015; in 2012, 2013, and 2014 no fish wheel permits were issued. In 2015, 20 sockeye were harvested with village fish wheel permits in the Glennallen Subdistrict.

Subsistence Salmon Harvests in 2015

As shown in Table 12-2, ADF&G and NPS issued a total of 1,956 subsistence salmon permits for the Glennallen Subdistrict for 2015. This total is higher than both the recent 5-year average (1,713 permits), 10-year average (1,532 permits), and the historical average (1989–2014; 1,170) and continues a relatively steady increase in issued permits since 1990 In 1990, due to the McDowell decision, all residents of Alaska could obtain a subsistence permit for the Glennallen Subdistrict, accounting for much of the sharp increase in issued permits and harvest in this area.

The estimated total Glennallen Subdistrict subsistence salmon harvest in 2015 for both federal and state fisheries was 115,887 salmon, the majority of which were sockeye salmon (Table 12-2). The harvest was composed of 112,937sockeye salmon (approximately 98% of the year's salmon harvest), 2,762 Chinook salmon, and 188 coho salmon. Pink and chum salmon are generally not available in the Upper Copper River. The 2015 harvest was the highest ever recorded for this fishery, and notably higher than the 5-year average (97,045 salmon), 10-year average (88,775 salmon), and the historical average (1989–2014; 72,614 salmon).

Table 12-3 reports subsistence salmon harvests in the Glennallen Subdistrict by place of residence of permit holders in 2015. Copper Basin residents caught 27% of the harvest (31,614 salmon) and other Alaska residents harvested 73% (84,273 salmon). Of all Glennallen Subdistrict permits (federal and state), residents of Copper Basin communities held 372 permits (approximately 19%) and other Alaska residents held 1,584 permits (81%) (Table 2-3). The communities with the most permits and salmon harvested were Anchorage with 407 permits (18,069 salmon harvested), Fairbanks with 296 permits (13,283 salmon harvested), Wasilla with 268 permits (17,715 salmon), Palmer with 146 permits (7,051 salmon), and Copper Center with 110 permits issued (12,014 salmon harvested).

Chitina Subdistrict State Personal Use Fishery

Regulations

The regulatory history of the Chitina Subdistrict is complex; in 1984, and from 1986 through 1999, the Chitina Subdistrict was closed to subsistence fishing. The dip net fishery was operated as a personal use fishery during this time. At its December 1999 meeting, the BOF reversed its earlier decision and determined that the Chitina Subdistrict supported customary and traditional (C&T) uses of salmon, returning the classification of the fishery to subsistence. In February 2003, the BOF reconsidered that decision, resulting in a negative C&T finding, which returned the classification to personal use.

The Chitina Subdistrict personal use fishery is managed under the Copper River Personal Use Dip Net Salmon Fishery Management Plan (5AAC 77.591). The fishing season runs from June 7 to September 30. Inseason, this fishery is managed by emergency orders which set weekly fishing periods and harvest limits, based on the projected in-river returns and escapement estimates at the sonar station located at Miles Lake.

There are state and federal permit programs for the Chitina Subdistrict. Under state regulations, a household permit and an Alaska state resident sport fishing license are required for personal use fishing in

the Chitina Subdistrict. Households may not possess both the Chitina state personal use permit and the Glennallen state subsistence permit in the same year. Under state regulations, dip nets are the only legal gear in the Chitina Subdistrict. In December 2014, the Board of Fisheries changed the annual limits for this fishery to be based on household size, allowing 25 salmon for the head of household (permit holder) and 10 additional salmon per dependent of the permit holder.[3] Only 1 Chinook salmon may be harvested annually. Rainbow/steelhead trout taken by dip net under the state fishery must be released immediately and returned to the water unharmed. Additional permit requirements are for the fisher to indicate whether they fished from a boat or from shore, and that the tail tips of personal use caught fish must be clipped immediately. Additionally a proposal was adopted to amend the Copper River King Salmon Management Plan to provide emergency order authority to establish a bag limit for king salmon taken with a fish wheel or dip net to ensure escapement goals.[4]

Personal Use Salmon Harvests in 2015

As reported in Table 12-4, the estimated total salmon harvest in the Chitina Subdistrict personal use fishery in 2015 was 234,850 fish, including 232,266 sockeye salmon (99%), 1,631Chinook salmon, and 953 coho salmon. In 2015, 12,571 permits were issued. The 2015 total estimated harvest was the highest ever estimated for this fishery, well above the recent 5-year (156,335 salmon) and 10-year (136,798 salmon) averages, as well as the historical average (1989–2014; 119,343 salmon). The number of permits issued, as well as the number of sockeye salmon harvested, also set records, and were above the 5- and 10-year averages, as well as the historical average. Harvests of Chinook salmon were above the recent 5-year average and 10-year averages, but below the historical average (which reflect the regulatory change limiting personal use permittees to 1 Chinook salmon). Coho salmon harvests in 2015 were below all three averages.

Table 12-5 reports estimated salmon harvests in the Chitina Subdistrict personal use fishery by mailing address of state permit holders in 2015; most participants in this fishery lived in Fairbanks, Anchorage, or the Matanuska–Susitna Borough. Only 49 Copper Basin residents (<1%) obtained state personal use salmon permits for the Chitina Subdistrict in 2015. The other permits were issued to non-area residents, who harvested all but 945 of the salmon harvested (>99%). The communities with the most permits issued were Anchorage (3,752 permits), Fairbanks (3,294 permits), Wasilla (1,215), North Pole (1,059 permits), and Palmer (653 permits).

Chitina Subdistrict Federal Subsistence Fishery

Regulations

In 2015, qualified Alaska rural residents could obtain federal subsistence permits for the Chitina Subdistrict from NPS. Legal gear included fish wheels, dip nets, and rod and reel. Federally-qualified rural resident households could hold permits for both the federal and state Chitina Subdistrict fisheries, or for the Chitina federal fishery and the Glennallen state and federal subsistence fishery, but state and federal harvest limits are not additive. Federal seasonal limits for the Chitina Subdistrict were the same as for the Glennallen Subdistrict, but also could not be combined. In 2015, inseason special actions were taken to liberalize fishing opportunity for federally qualified users of the Chitina Subdistrict.[5] Under federal regulations, rainbow/steelhead trout incidentally taken from fish wheels could be retained.

3. Alaska Department of Fish and Game Division of Sport Fish, "2014 Alaska Board Of Fisheries changes to the subsistence, personal use, and sport fishing regulations in the Upper Copper/Upper Susitna drainages," news release, December 12, 2014. Accessed August 15, 2017. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/505813360.pdf
4. Alaska Department of Fish and Game Division of Sport Fish, "2014 Alaska Board Of Fisheries changes to the subsistence, personal use, and sport fishing regulations in the Upper Copper/Upper Susitna drainages," news release, December 12, 2014. Accessed August 15, 2017. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/505813360.pdf
5. U.S. Department of the Interior Federal Subsistence Management Program, "Subsistence News," Accessed September 9, 2016, https://doi_dev.opengov.ibmcloud.com/subsistence/news

Federal Subsistence Harvests in 2015

As reported in Table 12-6, an estimated 2,507 salmon were harvested in the federal Chitina Subdistrict subsistence fishery in 2015. This is below the recent 5-year average of 2,764 salmon but above the 10-year (2005–2014; 2,086 salmon) and historical averages (2003–2014; 2,002 salmon).

The total harvest included 2,475 sockeye salmon (99%), 17 coho salmon, and 15 Chinook salmon. A total of 111 permits were issued, which was the second largest number of issued permits since 2003. Table 12-7 reports harvest and permit numbers according to each permittee's community of residence in 2015 for the Chitina Subdistrict. Kenny Lake, Chitina, Glennallen, McCarthy, and Copper Center had the most permits issued.

Native Village of Batzulnetas Subsistence Fishery

Regulations

For both state and federal subsistence fisheries in the Batzulnetas area, the open area is all waters from regulatory markers near the mouth of Tanada Creek and approximately one-half mile downstream from that mouth and all waters of Tanada Creek between regulatory markers. Legal gear includes fish wheels and dip nets in the Copper River and dip nets and spears in Tanada Creek. The state fishing season is open June 1–September 1 or until the season is closed by emergency order. During the season fishing periods are established by emergency order and are limited to 48-hour periods per week beginning June 5, and 84-hour periods per week from July 1 till the end of the season. The federal fishing season is May 15–September 30 or until the season is closed by special action.

Subsistence Harvests in 2014

Since 1987, subsistence permits have been issued in 7 of the 26 years (Table 12-8). One permit was issued and returned every year from 1998 through 2004. No permits were issued for the years 2005 through 2009. Three permits were issued and returned each year from 2010 to 2013, with two being issued and returned in 2014. Four permits were issued and returned in 2015, with no salmon being harvested. The historical average (1987–2014) harvest for this fishery is 130 sockeye salmon, with the highest harvest occurring in 1994 with a take of 997 sockeye salmon.

COPPER RIVER DISTRICT

State Subsistence Fishery

Background and History

The Copper River District is defined as waters surrounding Hinchinbrook Island between the tip of Hook Point and Boswell Rock, including Boswell Bay waters south of a line from Boswell Rock to the radio tower at Whitshed Village, and waters between Whitshed Village and west of a line from a point on the mainland at 60° 10.21′ N lat. 144° 35.57′ W long. to the northernmost tip of Fox Island and then extending south from Fox Island along 144° 36.12′ W long. All waters in this district have been determined to support customary and traditional uses of salmon. The subsistence fishery takes place in the Copper River District at the mouth of the Copper River (Copper River Flats) near the community of Cordova. Residents of Cordova are the primary participants in this fishery.

ADF&G, with the direction of the BOF, manages salmon runs to the Copper River District to assure sustained yield to meet all user group allocations as outlined in the Copper River District Salmon Management Plan (5 AAC 24.360).

Regulations

Permits are required to participate in subsistence fishing for salmon and freshwater fish species under the authority of 5 AAC 01.630. Fishers must declare their intent to fish in the Copper River Flats Area or in Prince William Sound, since the permit is valid for only one or the other location. Legal gear is set or drift

gillnet no longer than 50 fathoms. The fishing season is May 15–September 30, with additional restrictions during times of commercial fishing activity. Subsistence fishing is allowed 7 days per week in the Copper River District from May 15 until 2 days before the opening of the commercial fishery. Once commercial fishing has commenced, subsistence fishing is allowed only during commercial fishing periods, generally lasting 12 to 36 hours. Commercial fishing periods began on May 14 in 2015. Regulations stipulate that 2 days following the closure of the Copper River District to commercial salmon fishing for the season, subsistence fishing is allowed 7 days a week until September 30. In the commercial salmon fishing season in the Copper River District closed on October 8. Annual limits for salmon are 15 for a household of one; 30 salmon for a household of 2 or more; and 10 salmon for each additional person in the household. There is a limit of 5 Chinook salmon per permit. In addition, there is also a state permitted educational drift gillnet fishery. An educational fishery program is a systematic program for educating persons concerning historic, contemporary, or experimental methods for locating, harvesting, handling, or processing fishery resources (5 AAC 93.200).

Subsistence Salmon Harvests in 2015

As reported in Table 12-9, 243 permits were issued for this fishery in 2015, and 234 (96%) were returned. Participation in 2015 was lower than in recent years, below both the 5-and 10-year averages (359 and 375 permits, respectively), but greater than the historical average (1965–2014; 181 permits). The estimated 2015 harvest of 1,709 salmon was a decrease from the previous year (1,939) and was well below the recent 5- and 10-year averages. The 2015 harvest was composed of 1,531 sockeye salmon (90%) and 178 Chinook salmon (10%), with no chum or pink salmon harvested. Most permit holders lived in Cordova (208) and took 91% of the total harvest (Table 12-10). Harvest numbers for the educational fishery have not been reported in the Annual Salmon reports prior to 2015, but will be included in subsequent years. Harvest information is tracked by Division of Commercial fish, with a 2015 sockeye harvest of 91 fish, and 10-year average (2005–2015) of 78 fish (Haught et al. 2017:44).

PRINCE WILLIAM SOUND

Eastern District (Tatitlek) Subsistence Salmon Fishery

Background and History

Although the Eastern District is defined as those waters of the eastern mainland shore from the radio tower at Whitshed Village to Point Freemantle, including Bligh Island, Goose Island, and other adjacent islands (5 AAC 24.200 (c)), salmon may be taken for subsistence purposes only in those waters north of a line from Porcupine Point near Goose Island to Granite Point near Glacier Island, and south of a line from Point Lowe to Tongue Point in Valdez Arm (5 AAC 01.648 (b)). The primary participants in this fishery are residents of Tatitlek. Prior to 1992, permits were issued only in Tatitlek, but since 1992, they have been issued at the Cordova ADF&G office as well. Permits may be returned in person to the Cordova ADF&G office or the Tatitlek Village IRA Council office, or mailed at the end of the fishing season.

Regulations

Legal gear for this fishery includes seines up to 50 fathoms in length and 100 meshes deep with a maximum mesh size of 4 in, or gillnets up to 150 fathoms in length with a maximum mesh size of 6¼ in. Pink salmon may be taken in fresh water with dip nets only. The open season is May 15–October 31, under the following fishing periods: 7 days per week from May 15 until 2 days before the commercial opening of the Eastern District; during the commercial fishing season, but only during commercial openers; and 7 days per week from 2 days after the closure of the commercial season through October 31. There are no bag or possession limits for this fishery.

Subsistence Harvests in 2015

In 2015, there were 16 permits issued for this fishery (Table 12-11). The reported total harvest was 261 salmon, up from 2014, but a substantial decrease from the past few years and well below the 5-year, 10-

year, and historical averages. The 2015 harvest numbers from permit returns are substantially lower than household survey results from 2014 (Fall and Zimpelman, 2016), indicating that the harvest assessment program for this fishery may underestimate harvests; similar indications arise from comparisons of past household survey results as well. As shown in Table 12-12, household surveys in Tatitlek resulted in an estimate of 1,085 salmon taken with subsistence methods in 2014, compared to the 149 salmon (Table 12-11) based on returned permits. In Tatitlek, salmon for home use are also acquired with rod and reel and removal from commercial harvests.

Southwestern District (Chenega) Subsistence Salmon Fishery

Background and History

The Southwestern District is described as the mainland waters from the outer point of the north shore of Granite Bay to Cape Fairfield, as well as the waters surrounding Knight, Chenega, Bainbridge, Evans, Elrington, and Latouche islands and their adjacent islands (5 AAC 24.200 (i)). Under regulations in place since 1988, salmon may be taken in the Southwestern District as well as in waters along the northwestern shore of Green Island from the westernmost tip of the island to the northernmost tip (5 AAC 01.648 (a)). The primary participants in this fishery are residents of Chenega Bay. Prior to 1992, permits were issued only in Chenega Bay, but since 1992, they have also been issued at the Cordova ADF&G office. Permits may be returned in person to the Cordova ADF&G office or the Chenega IRA Council office, or mailed at the end of the fishing season.

Regulations

Legal gear for this fishery includes seines up to 50 fathoms in length and 100 meshes deep with a maximum mesh size of 4 in, and gillnets up to 150 fathoms in length with a maximum mesh size of 6¼ in. Pink salmon may be taken in fresh water with dip nets only. The open season is May 15–October 31 under the following fishing periods: 7 days per week from May 15 until 2 days before the commercial opening of the Southwestern District; during the commercial fishing season at the time of commercial openers; and 7 days per week from 2 days after the closure of the commercial season through October 31. There are no bag or possession limits for this fishery.

Subsistence Harvests in 2015

In 2015, 21 permits were issued for this fishery and 4 were returned. Both the harvest and number of permits were down from the previous years. Because permit return rates for this fishery have been low in the past, data in Table 12-13 reflect reported harvests only. The reported harvest for 2015 was 103 salmon, with 56 sockeye, 35 coho, and 12 chum salmon harvested. The 2015 harvest is the fourth-lowest reported harvest on record. with an unusually low harvest sockeye and chum salmon. However, it is likely that the harvest assessment program for this fishery continues to underestimate harvests. As shown in Table 12-14, household surveys in Chenega Bay in 2014 (Fall and Zimpelman, 2016) provided an estimate of 979 salmon taken with subsistence methods, including sockeye, chinook, and chum salmon harvests which were absent from the reported permit harvests for that year.

Prince William Sound General Districts

Background and History

Subsistence fishing for salmon is allowed in the districts of the Prince William Sound Area that are outside of the Valdez Nonsubsistence Area and are not included in the above sections. Since the creation of separate regulations for the waters fished by Tatitlek and Chenega Bay residents in 1988, it appears that participation in the general Prince William Sound fishery has been low. Residents of Anchorage are the primary participants in this fishery.

Regulations

Subsistence fishing in the other districts of the Prince William Sound Area is open in conformance with commercial fishing regulations regarding gear, open areas, and open periods. Permits are required and may be obtained from the Cordova ADF&G office. Annual limits are 15 salmon for a household of one, 30 salmon for a household of 2, and 10 salmon for each additional person in the household.

Subsistence Harvests in 2015

In the last 27 years, issued permits have been typically low, with a 5-year average of 10 and a 10-year average of 9 (Table 12-15). In 2015, 23 permits were issued and 21 were returned; a record number of permits issued since 1988 (along with 2014). The estimated harvest for 2015 was 74 salmon, consisting of 71 sockeye salmon and 3 chum salmon. The 2015 harvest is above the 5 and 10 year average harvest, but below the historical (1960–2014) harvest respectively (Table 12-15). The majority of permit holders in this fishery in 2015 were residents of Anchorage (17), with 3 from Girdwood and two permit holders coming from other Southcentral communities (Table 12-16).

Prince William Sound/Chugach National Forest Federal Subsistence Fishery

Background and History

In 2005, the federal government began issuing permits on federal lands for subsistence harvests in PWS and the lower Copper River area (Haught et al. 2017:44). Although previous Annual Salmon reports have not reported this federal permitted fishery, the 2015 report and subsequent reports will include this harvest information.

Regulations

Allowable gear types for the Prince William Sound/Chugach Subdistrict include dip net, rod and reel, and spear.

Subsistence Harvests in 2015

In 2015, reported harvest of total salmon in the Federal subsistence fishery, Prince William Sound/Chugach Subdistrict was 1,045 salmon. This included 152 sockeye, and 893 coho salmon. The total number of issued permits was 94, with 64 returned permits (Table 12-17).

Other Subsistence Fisheries in the Prince William Sound Area

Subsistence halibut harvest estimates for eligible communities and tribes in the Prince William Sound Area communities of Cordova, Chenega Bay, and Tatitlek are available for 2014 (Fall and Lemons 2016).

In 2015, ongoing harvest assessment programs did not exist for other subsistence finfish fisheries in the Prince William Sound Area. However, there is a subsistence permit available for the harvest of freshwater finfish species, which is issued out of the Glennallen ADF&G office. Also, in the Upper Copper River watershed, resident species such as Arctic grayling, burbot, and whitefishes, among other species, are harvested for home use. Harvest estimates based on household surveys are available in the CSIS.

The Division of Subsistence, in collaboration with the Copper River Native Association, the Cheesh'Na Tribal Council, the Mentasta Tribal Council, and the Chitina Tribal Council, conducted a household survey to collect nonsalmon fish harvests and use information in Copper Basin communities for a 12-month period from October 2000–September 2001. In total, 472 households were interviewed, 42% of the estimated 1,193 households living in Copper Basin communities. The study produced estimated harvests by study community and gear type for burbot, Arctic char/Dolly Varden, lake trout, Arctic grayling, northern pike, longnose suckers, rainbow/steelhead trout, and whitefishes. Detailed summaries of study methods and findings appear in Simeone and Kari (2005).

Residents of Cordova, Chenega Bay, Tatitlek, Valdez, and Whittier take a variety of shellfish and marine finfishes for subsistence uses. Harvest estimates are available in the CSIS based upon systematic household surveys. Subsistence fishing for shrimp is open April 15–September 15, with no more than 5 pots per person and 5 pots per vessel, and no bag or possession limits. The year 2006 was the first year in which a permit was not required. In March 2009, the BOF adopted a Prince William Sound Pot Shrimp Management Plan that allocated 40% of the harvestable surplus of shrimp to commercial users and 60% to noncommercial users. Harvestable surplus is estimated annually prior to the start of the fishing season (April 15) with a surplus production model that requires more timely and precise estimates of noncommercial harvest than are provided by the statewide harvest survey (SWHS). This made it necessary to reinstate the noncommercial shrimp permit prior to the start of the 2009 shrimp pot fishery season. The Prince William Sound noncommercial shrimp permit requires all noncommercial users to report the date, location, duration, number of pots, and harvest of shrimp (gallons) for each set of pot gear made throughout the fishing season (April 15–September 15). Detailed summaries of harvest estimates and data from returned permits appear in Blain-Roth et al. (2017) for 2015. Subsistence fishing for Dungeness, Tanner, and king crabs in the Prince William Sound Management Area was closed, either by regulation or by emergency order, due to low stock status.

Table 12-1.–Subsistence harvests by village fish wheel permits, Glennallen Subdistrict, 1997–2015.

		Reported subsistence harvest					
Year	Village	Chinook	Sockeye	Coho	Steelhead	Other	Total
1997	Chistochina	105	342	139	88	1	675
1997	Gakona	8	1,242	0	0	0	1,250
1997	Kluti-Kaah	12	61	0	0	0	73
1999	Chickaloon	1	5	0	0	0	6
1999	Gakona[a]	0	0	0	0	0	0
1999	Kluti-Kaah	46	85	0	0	0	131
2000	Chickaloon	73	200	0	0	0	273
2000	Chistochina	1	880	0	0	0	881
2000	Kluti-Kaah	20	110	0	0	0	130
2001	Chickaloon	20	120	0	0	0	140
2001	Chistochina	4	1,203	0	0	0	1,207
2001	Kluti-Kaah	3	259	114	0	0	376
2002	Chickaloon	0	91	0	0	0	91
2002	Chitina[b]	0	0	0	0	0	0
2003	Chickaloon	8	105	0	0	0	113
2004	Chickaloon	5	178	0	0	0	183
2004	Chistochina	17	1,563	0	0	0	1,580
2005	Chistochina	4	545	0	0	0	549
2005	Chickaloon	20	533	0	0	1	554
2005	Gakona	9	442	0	0	0	451
2006	Chistochina	8	559	0	0	0	567
2006	Chickaloon[b]	0	0	0	0	0	0
2006	Chitina	0	497	0	0	0	497
2007	Chitina[b]	0	0	0	0	0	0
2008	Chickaloon[b]	0	0	0	0	0	0
2008	Gakona	1	241	15	0	0	257
2009	Chickaloon[b]	0	0	0	0	0	0
2009	Kluti-Kaah	0	30	0	0	0	30
2010	Chickaloon	2	237	0	0	0	239
2010	Gakona[a]	0	0	0	0	0	0
2010	Kluti-Kaah[b]	0	0	0	0	0	0
2011	Gulkana	2	50	0	0	0	52
2011	Gakona	5	37	0	0	0	42
2013	Mentasta Lake	5	551	0	0	0	556
2014	Mentasta Lake	0	158	0	0	0	158
2015	Chickaloon	0	20	0	0	0	20

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. Did not fish

b. Did not return permit.

Table 12-2.–Historical subsistence salmon harvests, Glennallen Subdistrict, 1989–2015.

	Permits		Estimated salmon harvest[a]					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1989	386	360	796	28,724	67	0	0	29,587
1990	406	384	639	32,219	91	0	0	32,949
1991	712	645	1,314	39,364	241	0	0	40,919
1992	655	619	1,440	45,115	345	0	0	46,900
1993	773	696	1,443	54,003	76	0	0	55,523
1994	970	776	1,979	69,143	71	0	0	71,193
1995	858	726	1,968	54,336	975	0	0	57,280
1996	850	788	1,483	52,269	552	0	0	54,305
1997	1,136	1,058	2,608	83,692	183	0	0	86,483
1998	1,010	951	1,846	64,876	553	0	0	67,275
1999	1,102	1,040	3,234	76,456	1,145	0	0	80,835
2000	1,251	1,197	4,937	60,551	539	5	0	66,032
2001	1,239	1,176	3,480	81,960	1,142	20	0	86,601
2002	1,308	1,162	4,446	63,028	686	1	0	68,161
2003	1,227	1,101	3,344	64,618	650	0	0	68,612
2004	1,212	1,032	4,503	82,174	880	0	0	87,557
2005	1,234	1,070	2,785	91,715	252	0	0	94,752
2006	1,239	1,100	3,233	78,244	266	0	0	81,743
2007	1,458	1,277	4,125	86,678	308	0	0	91,110
2008	1,455	1,269	3,417	59,293	694	0	0	63,404
2009	1,364	1,138	3,341	67,887	287	0	0	71,515
2010	1,587	1,331	2,653	92,632	422	0	0	95,706
2011	1,586	1,328	3,649	81,216	1,131	0	0	85,996
2012	1,805	1,557	2,649	94,991	470	0	0	98,110
2013	1,616	1,400	2,663	96,573	154	0	0	99,390
2014	1,972	1,660	1,869	103,860	295	0	0	106,024
2015	1,956	1,650	2,762	112,937	188	0	0	115,887
5-year average (2010–2014)	1,713	1,455	2,697	93,854	494	0	0	97,045
10-year average (2005–2014)	1,532	1,313	3,038	85,309	428	0	0	88,775
Historical average (1989–2014)	1,170	1,032	2,686	69,447	480	1	0	72,614

Source ADF&G Division of Subsistence, ASFDB 2015 (ADF&G 2016).

a. Starting in 2002, estimates include salmon harvested under federal as well as state subsistence fishing regulations and permits.

Table 12-3.–Subsistence salmon harvests by community of residence, Glennallen Subdistrict, 2015.

	Permits		Estimated salmon harvest[a]					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Chistochina	5	5	3	786	0	0	0	789
Chitina	19	16	21	1,862	12	0	0	1,895
Copper Center	110	99	148	11,867	0	0	0	12,014
Copperville	4	3	63	448	85	0	0	596
Gakona	30	29	65	2,375	0	0	0	2,440
Glennallen	82	74	107	6,047	0	0	0	6,154
Gulkana	4	2	0	0	0	0	0	0
Kenny Lake	37	33	34	1,574	4	0	0	1,612
McCarthy	16	12	0	40	0	0	0	40
Mendeltna	1	1	0	14	0	0	0	14
Nelchina	3	2	9	107	0	0	0	116
Slana	23	23	2	2,018	0	0	0	2,020
Tazlina	37	34	125	3,727	0	0	0	3,852
Tolsona	1	1	3	67	0	0	0	70
Subtotal, Copper Basin	**372**	**334**	**580**	**30,932**	**102**	**0**	**0**	**31,614**
Anchor Point	1	1	2	22	0	0	0	24
Anchorage	407	321	535	17,501	33	0	0	18,069
Anderson	2	2	0	123	0	0	0	123
Barrow	4	1	0	0	0	0	0	0
Beluga	1	1	5	10	0	0	0	15
Big Lake	11	7	13	688	0	0	0	701
Cantwell	2	2	0	44	0	0	0	44
Central	1	0	0	0	0	0	0	0
Chickaloon	1	1	0	20	0	0	0	20
Chugiak	26	22	33	694	0	0	0	727
Clear	1	0	0	0	0	0	0	0
Cooper Landing	1	1	0	54	0	0	0	54
Cordova	4	4	0	216	0	0	0	216
Delta Junction	50	47	53	1,998	0	0	0	2,051
Eagle River	67	61	130	3,670	0	0	0	3,799
Eielson AFB	2	2	1	44	0	0	0	45
Ester	3	3	9	689	0	0	0	698
Fairbanks	296	246	401	12,837	45	0	0	13,283
Fort Wainwright	2	2	1	10	0	0	0	11
Galena	1	1	3	138	0	0	0	141
Girdwood	2	2	0	6	0	0	0	6
Healy	2	2	2	10	0	0	0	12
Homer	1	1	0	68	0	0	0	68
Houston	3	3	7	162	0	0	0	169
Joint Base Elmendorf Richardson	1	1	4	43	0	0	0	47
Juneau	1	1	0	32	0	0	0	32
Kenai	3	2	2	68	0	0	0	69

-continued-

Table 12-3.–Page 2 of 2.

Community	Permits		Estimated salmon harvest[a]					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Kennicott	2	1	0	0	0	0	0	0
Kiana	1	0	0	0	0	0	0	0
King Cove	1	0	0	0	0	0	0	0
Mentasta Lake	4	4	0	426	0	0	0	426
Nabesna	2	2	2	166	0	0	0	168
Nenana	10	8	0	346	0	0	0	346
Nome	1	1	25	314	0	0	0	339
North Pole	102	85	114	5,165	0	0	0	5,279
Northway	10	9	3	651	0	0	0	654
Palmer	146	120	218	6,827	6	0	0	7,051
Peters Creek	1	1	1	18	0	0	0	19
Salcha	12	9	9	420	0	0	0	429
Seward	3	3	10	129	0	0	0	139
Sitka	1	1	1	30	0	0	0	31
Soldotna	2	2	11	392	2	0	0	405
Sterling	1	1	0	20	0	0	0	20
Sutton	5	4	3	143	0	0	0	145
Talkeetna	3	3	1	40	0	0	0	41
Tanacross	1	1	0	77	0	0	0	77
Tok	51	46	20	5,053	0	0	0	5,073
Tonsina	4	2	0	188	0	0	0	188
Two Rivers	4	3	1	223	0	0	0	224
Valdez	46	40	92	4,464	0	0	0	4,556
Wasilla	268	226	442	17,272	1	0	0	17,715
Willow	7	7	28	495	0	0	0	523
Subtotal, other communities	**1,584**	**1,316**	**2,181**	**82,005**	**87**	**0**	**0**	**84,273**
Total	**1,956**	**1,650**	**2,762**	**112,937**	**188**	**0**	**0**	**115,887**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. Includes salmon harvested under federal as well as state subsistence fishing regulations and permits.

Table 12-4.–Historical subsistence and personal use salmon harvests, state Chitina Subdistrict permits, 1989–2015.

	Permits		Estimated salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1989	4,584	4,353	2,269	56,547	865	0	0	59,681
1990	5,689	5,475	2,711	66,435	1,516	0	0	70,662
1991	6,222	5,990	4,092	78,412	3,378	0	0	85,882
1992	6,387	6,229	3,422	87,090	1,524	0	0	92,036
1993	7,914	7,914	2,729	89,629	1,358	0	0	93,716
1994	7,060	5,939	4,198	106,163	2,204	0	0	112,566
1995	6,762	5,442	5,617	94,494	5,861	0	0	105,972
1996	7,196	6,962	3,607	95,645	3,404	0	0	102,656
1997	9,086	8,919	5,470	149,020	160	0	0	154,650
1998	10,002	9,751	6,746	137,530	2,156	0	0	146,431
1999	9,941	9,607	5,964	142,682	2,199	0	0	150,845
2000	8,145	7,676	3,219	109,370	3,758	0	0	116,347
2001	9,458	8,356	3,171	137,047	2,687	0	0	142,905
2002	6,804	5,736	2,093	90,655	2,034	0	0	94,782
2003	6,440	5,438	1,962	84,790	2,579	0	0	89,332
2004	8,153	6,855	2,521	111,203	2,751	0	0	116,476
2005	8,232	6,768	2,155	129,506	1,885	0	0	133,546
2006	8,497	6,762	2,598	128,469	2,343	0	0	133,410
2007	8,378	7,187	2,782	131,460	1,747	0	0	135,990
2008	8,041	6,861	1,991	82,961	2,747	0	0	87,699
2009	7,958	6,908	229	93,766	1,667	0	0	95,662
2010	9,308	7,757	700	140,089	1,892	0	0	142,680
2011	9,167	7,566	1,118	138,089	1,866	0	0	141,073
2012	10,016	8,030	613	136,441	1,411	0	0	138,465
2013	10,424	8,482	762	185,970	882	0	0	187,614
2014	11,618	9,332	812	169,971	1,059	0	0	171,842
2015	12,571	10,509	1,631	232,266	953	0	0	234,850
5-year average (2010–2014)	10,107	8,233	801	154,112	1,422	0	0	156,335
10-year average (2005–2014)	9,164	7,565	1,376	133,672	1,750	0	0	136,798
Historical average (1989–2014)	8,134	7,165	2,829	114,363	2,151	0	0	119,343

Source ADF&G Division of Subsistence, ASFDB 2015 (ADF&G 2016).

Note Under state regulations, this fishery was classified as personal use from 1986 through 1999; in 2000, 2001, and 2002, it was classified as a subsistence fishery, in 2003, it was reclassified as personal use.

Table 12-5.–Personal use salmon harvests by community of residence, state Chitina Subdistrict permits, 2015.

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Chitina	2	1	0	0	0	0	0	0
Copper Center	21	16	3	406	0	0	0	408
Glennallen	26	23	5	532	0	0	0	537
Subtotal, Copper Basin	**49**	**40**	**7**	**938**	**0**	**0**	**0**	**945**
Alakanuk	1	0	0	0	0	0	0	0
Anaktuvuk Pass	2	2	1	16	0	0	0	17
Anchor Point	8	8	0	163	0	0	0	163
Anchorage	3,752	3,024	530	59,830	264	0	0	60,624
Anderson	5	4	0	20	0	0	0	20
Arctic Village	2	2	0	21	0	0	0	21
Auke Bay	2	2	0	12	0	0	0	12
Barrow	18	13	3	559	0	0	0	562
Beaver	1	0	0	0	0	0	0	0
Bethel	1	0	0	0	0	0	0	0
Bettles Field	1	0	0	0	0	0	0	0
Big Lake	57	46	7	834	0	0	0	841
Bird Creek	2	2	0	57	0	0	0	57
Cantwell	5	3	0	93	0	0	0	93
Central	3	3	1	76	0	0	0	77
Chickaloon	9	8	0	144	2	0	0	146
Chicken	1	1	0	4	0	0	0	4
Chuathbaluk	1	0	0	0	0	0	0	0
Chugiak	175	147	20	2,975	1	0	0	2,996
Clam Gulch	2	2	1	30	0	0	0	31
Clear	6	6	1	207	0	0	0	208
Cooper Landing	1	1	0	0	0	0	0	0
Cordova	1	1	0	0	0	0	0	0
Delta Junction	398	360	57	11,145	12	0	0	11,215
Denali National Park	32	29	4	593	7	0	0	604
Douglas	2	1	0	0	0	0	0	0
Dutch Harbor	1	1	0	0	0	0	0	0
Eagle	3	3	0	70	0	0	0	70
Eagle River	487	421	65	7,064	24	0	0	7,153
Eielson AFB	103	91	17	2,068	0	0	0	2,085
Ester	80	66	10	1,754	10	0	0	1,773
Fairbanks	3,294	2,783	417	68,382	335	0	0	69,134
Fort Greely	31	27	6	396	10	0	0	412
Fort Wainwright	181	140	30	2,878	13	0	0	2,921
Fort Yukon	2	0	0	0	0	0	0	0
Fox	1	0	0	0	0	0	0	0
Gakona	5	5	1	48	0	0	0	49
Galena	1	0	0	0	0	0	0	0
Girdwood	39	35	7	762	0	0	0	769
Gustavus	2	2	0	0	1	0	0	1

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Table 12-5.–Page 2 of 3

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Homer	14	11	0	148	4	0	0	151
Hoonah	1	1	0	25	0	0	0	25
Hope	1	1	0	0	0	0	0	0
Houston	15	13	5	260	0	0	0	264
Huslia	1	1	1	30	0	0	0	31
Indian	10	9	1	174	0	0	0	176
Joint Base Elmendorf Richardson	59	53	2	708	0	0	0	710
Juneau	14	12	1	221	0	0	0	222
Kaktovik	3	2	2	0	0	0	0	2
Kasigluk	1	0	0	0	0	0	0	0
Kasilof	4	4	1	34	0	0	0	35
Kenai	11	9	0	170	0	0	0	170
Ketchikan	4	3	0	21	0	0	0	21
Kodiak (city)	1	0	0	0	0	0	0	0
Kotzebue	4	4	1	131	0	0	0	132
Larsen Bay	1	0	0	0	0	0	0	0
Manley Hot Springs	2	1	2	60	0	0	0	62
Manokotak	1	1	0	0	0	0	0	0
McGrath	2	2	0	55	0	0	0	55
Minto	2	2	1	46	0	0	0	47
Moose Pass	2	2	0	0	0	0	0	0
Nenana	23	21	3	594	0	0	0	597
Nikiski	5	4	1	100	0	0	0	101
Nikolaevsk	1	1	0	25	0	0	0	25
Ninilchik	2	1	0	0	0	0	0	0
Nome	10	5	0	174	0	0	0	174
Noorvik	1	1	0	0	0	0	0	0
North Pole	1,059	899	133	22,451	118	0	0	22,702
Nulato	1	1	0	18	0	0	0	18
Palmer	653	560	62	11,440	59	0	0	11,562
Petersburg	1	1	0	78	0	0	0	78
Pilot Point	1	1	0	0	0	0	0	0
Pilot Station	1	1	0	25	0	0	0	25
Point Hope	2	2	0	31	0	0	0	31
Point Lay	1	1	0	25	0	0	0	25
Port Alsworth	1	1	0	0	16	0	0	16
Prudhoe Bay	1	0	0	0	0	0	0	0
Ruby	2	2	0	18	0	0	0	18
Salcha	60	47	3	1,048	1	0	0	1,052
Selawik	1	0	0	0	0	0	0	0
Seldovia	2	1	0	90	0	0	0	90
Seward	3	3	1	59	0	0	0	60
Sitka	2	2	0	8	0	0	0	8
Skagway	1	1	0	0	0	0	0	0
Soldotna	17	15	1	162	0	0	0	163
Sterling	5	5	1	34	0	0	0	35
Sutton	72	60	16	1,208	0	0	0	1,224
Talkeetna	28	20	3	573	0	0	0	575

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Table 12-5.–Page 3 of 3

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Tanana	1	1	1	11	0	0	0	12
Thorne Bay	1	0	0	0	0	0	0	0
Tok	21	19	3	401	0	0	0	405
Toksook Bay	1	1	0	4	0	0	0	4
Trapper Creek	5	5	0	59	0	0	0	59
Tununak	1	1	0	0	0	0	0	0
Two Rivers	21	19	3	607	0	0	0	610
Unalakleet	3	3	0	36	0	0	0	36
Valdez	282	243	22	4,789	3	0	0	4,815
Venetie	1	0	0	0	0	0	0	0
Ward Cove	1	1	0	0	0	0	0	0
Wasilla	1,215	1,022	164	22,504	65	0	0	22,733
Willow	51	42	6	965	0	0	0	971
Wiseman	1	1	0	35	0	0	0	35
Other USA	6	6	1	84	0	0	0	85
Unknown Community	42	42	3	762	4	0	0	769
Subtotal, other communities	**12,522**	**10,469**	**1,624**	**231,328**	**953**	**0**	**0**	**233,905**
Total	**12,571**	**10,509**	**1,631**	**232,266**	**953**	**0**	**0**	**234,850**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 12-6.–Historical subsistence salmon harvests, federal Chitina Subdistrict permits, 2003–2015.

Year	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2003	99	71	33	1,316	152	0	0	1,500
2004	109	83	9	1,631	28	0	0	1,668
2005	77	64	27	1,498	0	0	0	1,526
2006	76	62	16	1,681	26	0	0	1,723
2007	97	86	29	1,095	41	0	0	1,165
2008	81	65	26	939	97	0	0	1,062
2009	68	34	15	1,522	22	0	0	1,560
2010	92	38	36	5,352	88	0	0	5,476
2011	84	42	21	3,090	14	0	0	3,125
2012	90	80	5	981	9	0	0	996
2013	99	85	20	2,399	8	0	0	2,428
2014	113	102	15	1,709	74	0	0	1,797
2015	111	100	15	2,475	17	0	0	2,507
5-year average (2010–2014)	96	69	19	2,706	39	0	0	2,764
10-year average (2005–2014)	88	66	21	2,027	38	0	0	2,086
Historical average (2003–2014)	90	68	21	1,934	47	0	0	2,002

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 12-7.–Subsistence salmon harvests by community of residence, federal Chitina Subdistrict permits, 2015.

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Barrow	1	1	0	34	0	0	0	34
Cantwell	1	1	0	0	0	0	0	0
Chitina	10	8	4	286	0	0	0	290
Copper Center	26	25	2	432	0	0	0	434
Delta Junction	1	1	0	3	0	0	0	3
Gakona	3	3	0	14	0	0	0	14
Glennallen	10	10	0	38	0	0	0	38
Gulkana	2	1	0	0	0	0	0	0
Kenai	1	1	0	0	0	0	0	0
Kennicott	2	2	0	5	0	0	0	5
Kenny Lake	18	15	8	1,178	0	0	0	1,187
McCarthy	21	17	0	175	17	0	0	193
Nabesna	1	1	0	0	0	0	0	0
Point Baker	1	1	0	0	0	0	0	0
Tanacross	1	1	0	0	0	0	0	0
Tazlina	4	4	0	15	0	0	0	15
Tok	6	6	1	180	0	0	0	181
Tonsina	2	2	0	114	0	0	0	114
Total	**111**	**100**	**15**	**2,475**	**17**	**0**	**0**	**2,507**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 12-8.–Historical subsistence salmon harvests, Batzulnetas fishery, 1987–2015.

	Permits		Estimated salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1987	8	8	0	22	0	0	0	22
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	1	1	0	160	0	0	0	160
1994	4	4	0	997	0	0	0	997
1995	4	2	0	32	0	0	0	32
1996	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0
1998	1	1	0	382	0	0	0	382
1999	1	1	0	55	0	0	0	55
2000	1	1	0	55	0	0	0	55
2001	1	1	1	61	0	0	0	62
2002	1	1	0	208	0	0	0	208
2003	1	1	0	164	0	0	0	164
2004	1	1	0	182	0	0	0	182
2005	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	3	3	0	106	0	0	0	106
2011	3	3	0	101	0	0	0	101
2012	3	3	1	136	0	0	0	137
2013	3	3	5	862	0	0	0	867
2014	2	2	0	116	0	0	0	116
2015	4	4	0	0	0	0	0	0
5-year average (2010–2014)	3	3	1	264	0	0	0	265
10-year average (2005–2014)	1	1	1	132	0	0	0	133
Historical average (1987–2014)	1	1	0	130	0	0	0	130

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 12-9.–Historical subsistence salmon harvests, Copper River District (Copper River Flats), 1965–2015.

Year	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1965	31	20	19	711	132	0	0	862
1966	45	31	68	254	0	0	0	322
1967	61	56	90	167	0	0	0	257
1968	17	15	12	41	0	0	0	53
1969	49	33	24	94	126	0	0	244
1970	32	27	78	212	0	0	0	290
1971	29	26	11	36	4	0	0	51
1972	104	79	196	749	70	0	0	1,015
1973	94	89	162	344	190	0	0	696
1974	9	5	9	7	4	0	0	20
1975	2	2	0	5	0	0	0	5
1976	27	14	2	19	0	0	0	21
1977	23	22	10	74	0	0	0	85
1978	34	28	45	22	15	0	0	81
1979	49	41	54	31	20	0	0	105
1980	39	35	21	30	19	0	0	70
1981	72	51	68	205	147	0	0	419
1982	108	90	72	761	127	0	0	960
1983	87	73	94	128	68	0	0	290
1984	118	104	77	368	153	0	0	598
1985	94	94	88	261	83	0	0	432
1986	88	85	89	360	49	0	0	498
1987	95	89	52	383	15	0	0	450
1988	114	97	69	266	49	0	0	384
1989	75	64	66	397	60	0	0	523
1990	88	76	69	543	95	0	0	707
1991	129	115	153	931	43	0	0	1,126
1992	126	113	158	875	47	0	0	1,080
1993	111	93	143	511	35	0	0	689
1994	101	97	171	494	70	0	0	734
1995	126	112	173	779	35	0	0	987
1996	176	157	309	1,086	53	0	0	1,448
1997	269	243	223	1,144	1,967	0	0	3,333
1998	245	230	314	905	724	0	0	1,944
1999	294	275	377	1,422	729	0	0	2,528
2000	416	400	717	4,534	46	18	3	5,318
2001	468	439	881	3,275	75	2	0	4,232
2002	355	331	589	3,289	30	2	0	3,910
2003	384	367	730	1,655	37	0	16	2,439
2004	511	487	1,163	1,910	48	5	3	3,129
2005	237	224	260	830	15	0	1	1,106
2006	421	399	779	4,355	1	0	0	5,135
2007	469	445	1,211	6,458	16	2	6	7,694
2008	506	482	495	4,161	55	0	21	4,732
2009	323	293	232	1,916	23	1	0	2,173
2010	326	320	281	2,034	27	22	0	2,365
2011	273	263	220	1,839	35	2	0	2,096

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Table 12-9.–Page 2 of 2.

Year	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2012	378	359	248	4,499	0	19	0	4,767
2013	531	497	916	6,073	1	2	18	7,010
2014	288	269	161	1,771	0	5	2	1,939
2015	243	234	178	1,531	0	0	0	1,709
5-year average (2010–2014)	359	342	365	3,243	13	10	4	3,635
10-year average (2005–2014)	375	355	480	3,394	17	5	5	3,902
Historical average (1965–2014)	181	167	249	1,264	111	2	1	1,627

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 12-10.–Subsistence salmon harvests by community of residence, Copper River District (Copper River Flats), 2015.

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Anchorage	18	18	11	123	0	0	0	134
Chugiak	1	1	0	0	0	0	0	0
Cordova	208	200	166	1,386	0	0	0	1,552
Eagle River	2	2	0	20	0	0	0	20
Girdwood	4	3	0	0	0	0	0	0
Glennallen	1	1	0	0	0	0	0	0
Homer	2	2	0	0	0	0	0	0
Juneau	1	1	0	0	0	0	0	0
Valdez	1	1	1	2	0	0	0	3
Total	**243**	**234**	**178**	**1,531**	**0**	**0**	**0**	**1,709**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 12-11.–Historical subsistence salmon harvests, Prince William Sound, Eastern District, 1988–2015.

	Permits		Reported salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1988	17	NA	2	210	249	297	143	901
1989	14	NA	1	107	653	43	28	832
1990	13	NA	0	5	241	4	10	260
1991	19	NA	0	107	984	28	320	1,439
1992	15	NA	2	441	369	49	30	891
1993	18	NA	2	512	305	74	144	1,037
1994	14	NA	0	50	143	70	50	313
1995	15	0						
1996	6	NA	0	0	38	0	0	38
1997	6	NA	0	107	45	54	0	206
1998	11	NA	0	2	71	28	4	105
1999	17	NA	0	344	541	31	31	947
2000	12	3	0	140	468	40	40	688
2001	14	9	0	114	230	12	60	416
2002	19	8	6	437	278	66	71	858
2003	15	8	0	81	185	12	20	298
2004	18	12	2	358	505	28	105	998
2005	16	3	0	98	286	16	200	600
2006	11	1	0	3	18	25	35	81
2007	14	0						
2008	1	1	0	60	0	0	0	60
2009	12	4	0	170	131	0	0	301
2010	8	5	0	165	142	10	50	367
2011	10	4	0	922	536	22	0	1,480
2012	16	8	15	954	75	8	0	1,052
2013	22	11	0	613	277	129	0	1,019
2014	18	5	0	46	103	0	0	149
2015	16	4	0	110	143	8	0	261
5-year average (2010–2014)	15	7	3	540	227	34	10	813
10-year average (2004–2014)	13	4	2	337	174	23	32	568
Historical average (1988–2014)	14	5	1	242	275	42	54	613

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

NA = Data not available.

Table 12-12.–Estimated harvests of salmon for home use, Tatitlek, 2014.

	Estimated salmon harvest			
Species	Subsistence methods	Rod and reel	Removed from commercial harvests	All methods
Chinook	45	0	4	49
Sockeye	622	0	129	751
Coho	242	176	26	443
Chum	96	0	26	122
Pink	80	13	26	118
All salmon	**1,085**	**189**	**210**	**1,484**
Estimated number of households harvesting[a]	10 households	6 households	1 household	15 households (any method)

Source Fall et al. (2016).

a. Number of households in the community = 27; 21 (78%) were interviewed.

Table 12-13.–Historical subsistence salmon harvests, Prince William Sound, Southwestern District, 1988–2015.

	Permits		Reported salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1988	10	NA	1	50	8	294	251	604
1989	8	NA	0	322	0	180	554	1,056
1990	7	NA	1	36	5	2	20	64
1991	12	NA	3	345	42	53	195	638
1992	14	NA	1	526	23	99	313	962
1993	22	NA	2	835	50	124	232	1,243
1994	16	NA	5	192	77	161	402	837
1995	10	NA	2	152	67	41	67	329
1996	7	NA	0	107	7	46	105	265
1997	5	NA	44	193	30	272	110	649
1998	4	NA	13	114	20	119	65	331
1999	14	NA	57	499	62	101	168	887
2000	12	8	24	39	229	143	211	646
2001	16	9	2	119	92	146	95	454
2002	10	5	10	142	123	60	83	418
2003	13	7	6	219	156	147	149	677
2004	8	5	3	535	44	84	56	722
2005	13	8	10	515	84	174	124	907
2006	7	6	0	159	1	111	28	299
2007	4	3	2	293	27	55	4	381
2008	15	3	4	97	75	30	70	276
2009	5	4	2	168	26	84	5	285
2010	9	5	0	55	0	87	6	148
2011	17	6	2	134	26	60	50	272

-continued-

Table 12-13.–Page 2 of 2.

Year	Permits		Reported salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2012	23	14	0	603	20	77	0	700
2013	13	4	0	19	0	63	0	82
2014	10	5	0	0	0	0	10	10
2015	21	4	0	56	35	12	0	103
5-year average (2010–2014)	14	7	0	162	9	57	13	242
10-year average (2005–2014)	12	6	2	204	26	74	30	336
Historical average (1988–2014)	11	6	7	240	48	104	125	524

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

NA = Data not available.

Table 12-14.–Estimated harvests of salmon for home use, Chenega Bay, 2014.

Species	Estimated salmon harvest			
	Subsistence methods	Rod and reel	Removed from commercial harvests	All methods
Chinook	4	13	0	17
Sockeye	468	27	0	494
Coho	31	62	0	94
Pink	78	102	0	180
Chum	177	17	0	194
All salmon	**758**	**221**	**0**	**979**
Estimated number of households harvesting[a]	2 households	6 households	0 households	6 households (any method)

Source Fall et al. (2016).

a. Number of households in the community = 17; 12 (71%) were interviewed.

Table 12-15.–Historical subsistence salmon harvests, Prince William Sound general, 1960–2015.

	Permits		Estimated salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1960	50	NA	1	139	505	27	1,292	1,964
1961	12	NA	3	41	123	3	732	902
1962	9	NA	0	0	119	142	214	475
1963	9	NA	0	0	406	24	298	728
1964	15	NA	0	11	0	0	900	911
1965	22	16	0	0	0	34	246	281
1966	3	3	0	3	19	50	20	92
1967	4	3	0	0	5	0	5	11
1968	4	3	0	0	27	0	208	235
1969	7	3	0	0	37	0	0	37
1970	1	1	0	0	0	0	0	0
1971	3	2	0	0	0	0	69	69
1972	0	0	0	0	0	0	0	0
1973	19	16	0	0	343	0	0	343
1974	3	1	0	0	0	0	0	0
1975	2	0						
1976	0	0	0	0	0	0	0	0
1977	4	4	0	0	0	0	0	0
1978	3	2	0	0	0	0	0	0
1979	15	2	0	0	0	0	0	0
1980	26	15	0	12	10	0	0	23
1981	12	8	0	5	44	3	0	51
1982	35	27	0	109	5	31	40	185
1983	26	21	0	27	45	98	11	181
1984	8	8	0	10	0	2	11	23
1985	22	16	1	37	22	36	19	116
1986	25	14	0	9	27	0	0	36
1987	18	17	5	33	6	17	0	61
1988	7	7	2	51	7	9	10	79
1989	11	7	0	0	0	5	0	5
1990	8	8	0	0	7	0	4	11
1991	9	5	0	4	0	0	0	4
1992	10	6	0	33	0	0	0	33
1993	6	6	1	104	10	0	0	115
1994	5	4	0	0	0	0	0	0
1995	4	2	0	0	0	0	0	0
1996	10	7	0	0	0	0	0	0
1997	4	3	0	4	0	0	0	4
1998	4	3	0	0	0	0	0	0
1999	3	3	0	0	0	0	0	0
2000	3	3	0	0	0	0	0	0
2001	5	5	0	0	0	0	0	0
2002	11	9	0	38	0	9	11	57
2003	11	11	0	48	0	3	0	51
2004	8	7	0	12	0	5	0	17
2005	14	13	0	4	0	0	0	4
2006	11	9	0	20	30	0	0	50

-continued-

Table 12-15.–Page 2 of 2.

	Permits		Estimated salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2007	3	3	0	30	0	0	0	30
2008	11	10	1	33	0	0	0	34
2009	1	1	0	0	0	0	0	0
2010	1	1	0	0	0	0	0	0
2011	4	4	29	40	1	10	5	85
2012	14	12	0	67	0	32	0	99
2013	8	8	0	12	0	24	0	36
2014	23	21	0	6	0	0	0	6
2015	23	21	0	71	0	3	0	74
5-year average (2010–2014)	10	9	6	25	0	13	1	45
10-year average (2004–2014)	9	8	3	21	3	7	1	34
Historical average (1960–2014)	10	7	1	15	24	10	53	103

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

NA = Data not available.

Table 12-16.–Subsistence salmon harvests by community of residence, Prince William Sound general, 2015.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Anchorage	17	16	0	28	0	1	0	29
Cooper Landing	1	1	0	0	0	0	0	0
Girdwood	3	3	0	43	0	2	0	45
Saint Michael	1	0	0	0	0	0	0	0
Whittier	1	1	0	0	0	0	0	0
Total	**23**	**21**	**0**	**71**	**0**	**3**	**0**	**74**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 12-1.–Federal subsistence salmon harvests by community, Prince William Sound/Chugach Subdistrict, 2015.

	Permits		Reported salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Cordova	94	64	0	152	893	0	0	1,045
Total	**94**	**64**	**0**	**152**	**893**	**0**	**0**	**1,045**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

CHAPTER 13: THE SOUTHEAST REGION

INTRODUCTION

The Southeast region is divided by regulation into 2 areas: the Southeastern Alaska Area, which includes all waters between a line projecting southwest from the westernmost tip of Cape Fairweather and Dixon Entrance, and the Yakutat Area, which includes all waters of Alaska between the longitude of Cape Suckling and the longitude of Cape Fairweather. Positive customary and traditional use (C&T) findings, which allow for subsistence fishing opportunity, have been made for most of the waters in the Southeast region (5 AAC 01.716) (Figure 13-1). In areas where no positive C&T finding exists, personal use fisheries may be authorized. In addition, the Joint Board identified 2 nonsubsistence areas in the Southeast region: the Juneau Nonsubsistence Area and the Ketchikan Nonsubsistence Area (Figure 13-1) (5 AAC 99.015). By statute, no subsistence fisheries may be authorized in nonsubsistence areas.

The Southeast region is divided into 6 areas for management purposes:

Yakutat Management Area,

Haines Management Area,

Juneau Management Area,

Sitka Management Area,

Petersburg Management Area, and

Ketchikan Management Area.

HARVEST ASSESSMENT PROGRAMS

Since 1990, any Alaska resident may harvest salmon under state subsistence regulations. In the Southeast region permits are required for both subsistence and personal use salmon fishing. In most management areas, one permit is issued for both fisheries. In the Haines and Yakutat management areas, the permit is only for subsistence fisheries; no personal use fisheries are authorized in these areas. The Division of Commercial Fisheries is responsible for administering the subsistence and personal use salmon permit programs in the Southeast region. Permits are available at area offices. Department personnel or authorized designees also travel to Angoon, Hoonah, and Kake in the spring of each year to issue permits. There has been an annual salmon harvest assessment in the Southeast Alaska area since 1985, based on the permit reporting program. Annual harvest assessments did not begin in the Yakutat area until 1989. Permits are valid for one calendar year and must be returned by the date specified on the permit, usually in November. New permits will not be issued to anyone who has failed to return a permit issued for the previous year. Generally, however, area management offices will accept a harvest record for the previous year at the time a person applies for a current year's permit. Permit information, including names, addresses and details from the harvest calendars, such as locations and amount of harvest, species harvested, and date of harvest, is entered into *OceanAK*. All of the harvest information collected each year through returned permits composes the basis of the harvest assessment program in the Southeast region.

REGULATIONS

Subsistence regulations are valid in areas where there are fish stocks with positive C&T determinations; outside of these areas personal use regulations may apply. To participate in a subsistence fishery, a person must obtain a free permit for the area to be fished. To participate in personal use fisheries requires a permit as well as a valid resident sport fishing license, or to be exempt from licensing. In 2015, area managers had discretionary authority to change some permit conditions, such as season length or open

areas, or possession limits, either before the season begins or inseason, through issuing emergency orders. Permits are issued at the household level; one permit is issued per household and the household may not obtain or possess more than one permit per household. The permit recipient must be an Alaska resident. The content of subsistence and personal use permits is a mixture of personal information about the permittee, rules and regulations governing harvesting methods and means, and a harvest calendar that details all the fish caught under each permit. Permits are not issued for the taking of coho salmon in the Taku or Stikine River drainages, or for Chinook salmon, trout or char; however, such fish taken incidentally under the conditions of a permit are legally taken and must be recorded on the permit. The personal use limits on Chinook and coho salmon are 2 and 6 fish, respectively. Other regulations concerning the subsistence and personal use fisheries can be found in 5 AAC 01 (*Subsistence Finfish*) and 5 AAC 77 (*Personal Use Fishery*). These regulations include: fishermen must record their harvests on a daily basis prior to leaving the immediate fishing area; the permit must be with the permittee, other authorized members of the household, or authorized proxy while taking or transporting subsistence salmon; the dorsal fins of subsistence salmon and both tips of the tail fin of personal use salmon must be removed immediately when taken; fishing is not allowed within 300 ft of a dam, fish ladder, weir, culvert, or other artificial obstruction; sport-caught and subsistence-caught/personal use-caught salmon cannot be possessed on the same day; salmon taken under personal use or subsistence permits cannot be used for bait, and; salmon may not be harvested for subsistence or personal use by a line attached to a rod or pole, except in the Redoubt bay and lake subsistence salmon fishery. Regulations that apply to specific management areas are included in the relevant sections below.

SUBSISTENCE/PERSONAL USE SALMON HARVESTS IN 2015

In 2015, the total estimated subsistence and personal use salmon harvest for the Southeast region, based on returned permits, was 48,331 fish (Table 13-1). This is below the total estimated harvest for 2014 (52,507 salmon) as well as the most recent 5-year (57,342 salmon), 10-year (55,862 salmon), and historical averages (56,654 salmon) (Table 13-2). Sockeye salmon usually make up the largest proportion of subsistence/personal use salmon catches in Southeast Alaska, in contrast to the commercial fishery, which has been dominated by pink salmon harvests since the early 1900s (Tingley and Davidson 2011). As expected, in 2015, sockeye salmon contributed the greatest amount to the overall harvest at 38,738 fish (80%), followed by 4,908 pink salmon (10%), 2,990 coho salmon (6%), 1,202 chum salmon (3%), and 493 Chinook salmon (1%) (Table 13-1; Figure 13-2). While the number of each species of salmon harvested differed from the 2014 harvest, the overall contribution of each species to the total harvest did not change significantly: the 2015 harvest was stronger in pink salmon and weaker in sockeye and Chinook salmon harvests. Harvests of pink and chum salmon increased from 2014 estimates, but harvests of all other salmon species decreased. For a comparison, in the commercial fisheries in 2015, sockeye, chum, and Chinook salmon were above their 10-year averages, while coho and pink salmon harvests were below (Conrad and Gray 2016). Pink salmon have exhibited a strong odd-year, weak even-year return to the commercial fisheries since 2006, and this pattern appears visible in the subsistence/personal use harvests of 2015 as well. The estimated subsistence/personal use salmon harvests by management area were as follows: Ketchikan 12,036 (25%), Haines 9,151 (19%), Sitka 7,752 (16%), Juneau 7,257 (15%), Petersburg 6,347 (13%), and Yakutat 5,788 (12%) (Table 13-3, Figure 13-3). Compared to 2014, harvests in Ketchikan, Petersburg, and Juneau increased; harvests in the other management areas were smaller in 2015, with the largest decrease seen in Yakutat estimated harvests.

The number of permits issued per year, on average, for the 10-year time period of 2005–2014, has been 3,237 (Table 13-2). In 2015, a smaller than average number of permits was issued, with a total of 3,148 permits issued and 2,694 returned. This corresponds to a regionwide response rate of 86%, on par with the recent 5-year (87%) and 10-year (84%) averages. The harvests reported on the returned permits are expanded to account for the unreturned permits. Prior to 1996, only permits returned with harvest data were included in the database and reported harvests were not expanded to account for permits not returned.

YAKUTAT MANAGEMENT AREA

Yakutat Area Subsistence Fisheries

Background and History

The Yakutat Management Area stretches from Cape Fairweather to Cape Suckling and encompasses the Yakutat area subsistence fisheries. Fishing areas used by Yakutat residents are under the management responsibility of the Division of Commercial Fisheries' Yakutat Area offices. C&T findings by the Alaska Board of Fisheries (BOF) for salmon identify the freshwaters upstream from the terminus of streams and rivers from the Doame River to the Tsiu River, the waters of Yakutat Bay and Russell Fjord, and the waters of Icy Bay (5 AAC 01.666 (a)(3)). Unlike the other management areas, in the Yakutat Management Area subsistence salmon fishing locations are not restricted to specific streams, nor are there daily or annual limits on the number of fish harvested.

Yakutat is the only community within the Yakutat Management Area. The population of the Yakutat City and Borough decreased slightly from 2014 and was estimated at 610 in 2015.[1]

Regulations

There were no changes made to the subsistence permit in 2015. No daily or annual limits or restrictions to allowable subsistence gear were specified. Regulations specific to the Yakutat area were that the weekly subsistence fishing period during the commercial salmon net season was from 6:00 AM Friday to 6:00 PM Saturday. On the Situk River, subsistence fishers were required to attend their nets when they were being used to harvest salmon. In Yakutat Bay, each permit holder needed to attend their net at least once a day. Preseason, an emergency order was released on May 7, 2015 that closed subsistence fishing for Chinook salmon in the Situk-Ahrnklin Inlet.[2] Chinook salmon could not be retained in the sockeye salmon subsistence fishery either. The order was issued because the preseason forecast for the Situk River Chinook salmon return suggested that the return would be below desired levels and conservative action would be in order to ensure adequate levels of escapement.

Harvest Assessment Program

The estimated total subsistence salmon harvest for the Yakutat Management Area in 2015 was 5,788 salmon, including 4,310 sockeye salmon (74%), 982 coho salmon (17%), 323 Chinook salmon (6%), 164 pink salmon (3%), and 8 chum salmon (<1%) (Table 13-3). An estimated 98 permits were fished in the Yakutat Management Area (Table 13-3). Compared to 2014, about 20 fewer permits were estimated fished, and overall harvests decreased by slightly over 2,000 salmon. Most of the decrease came from harvests of sockeye salmon, but harvests of all species except pink salmon decreased.

Residents of Yakutat were issued 123 subsistence permits, with 117 returned (95%). The estimated total subsistence salmon harvest for the community of Yakutat in 2015 was 5,297 fish, down from 6,747 salmon in 2014. The 2015 harvest composition was 3,851 sockeye salmon (73%), 956 coho salmon (18%), 321 Chinook salmon (6%), 162 pink salmon (3%), and 8 chum salmon (<1%) (Table 13-4). Not all permits were necessarily fished in the Yakutat area.

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 9, 2016. http://live.laborstats.alaska.gov/pop/index.cfm
2. Alaska Department of Fish and Game Division of Commercial Fisheries, "Yakutat Subsistence Announcement," news release, May 7, 2015. Accessed June 20, 2017. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/529833294.pdf

HAINES MANAGEMENT AREA

Haines Area Subsistence Fisheries

Background and History

The Haines Management Area, encompassing the Haines area subsistence fisheries, stretches from Little Island in Lynn Canal north to Chilkat Inlet, and includes the waters of the Chilkat River, as well as the waters in the Chilkoot Inlet to Skagway. Subsistence salmon fisheries in the waters traditionally used by the residents of the Haines area are under the management responsibility of the Division of Commercial Fisheries' Haines Area office. Positive C&T findings for salmon identify all the waters of the Chilkat River and Chilkat Inlet north of the latitude of Glacier Point, and in the Chilkoot River, Lutak Inlet, and Chilkoot Inlet north of the latitude of Battery Point, excluding waters of Taiya Inlet north of the latitude of the tip of Taiya Point (5 AAC 01.716 (a)(2)).

There are several communities in the Haines Management Area: the city of Haines and surrounding borough, which includes the settlements of Covenant Life, Lutak, Mosquito Lake, Mud Bay, and Excursion Inlet, as well as Klukwan on the Chilkat River and Skagway at the head of Chilkoot Inlet. In 2015, the combined population of these communities was 3,624, a decrease of approximately 46 individuals over the 2014 estimate.[3] The populations of the Haines Borough and Skagway are predominantly non-Native, while Klukwan continues to have a predominantly Alaska Native population.

Regulations

There were no changes to the permit from 2014. The permit provided for an open season of June 1–September 30 for sockeye, coho, pink, and chum salmon in the Chilkat River, Chilkat Inlet, and Lutak Inlet. Preseason, a news release announced the closure of the marine subsistence fishery in Chilkat Inlet until July 15, 2015 due to a low preseason forecast for Chilkat River king salmon abundance.[4] Inseason, subsistence salmon fishing was extended through October 11, 2015 to allow additional subsistence harvest opportunity on late-run sockeye salmon.[5] The subsistence salmon fishery in Chilkat Inlet north of Glacier Point and in the Chilkoot and Lutak inlets north of Battery Point excluding Taiya Inlet was open the Saturday before and the day before any commercial drift gillnet openings in the waters of Section 15-A. Combined limits for the Chilkat River, the Chilkoot River, Chilkat Inlet, and Lutak Inlet for sockeye salmon are 25 in possession and 50 annually; for coho salmon, 20 in possession and 40 annually; and for pink salmon, chum salmon, or a combination of the two species, 75 in possession and 100 annually.

Allowable gear types in the Haines Management Area subsistence fishery are set and drift gillnets. This gear could be used to take salmon in the mainstem and side channels, but not in the tributaries of the Chilkat River from Mile 4 of the Haines Highway to 1 mile upstream of Wells Bridge. Drift and set gillnets could not exceed 50 ft in length when fishing in the Chilkat River, and drift gillnets fished in marine waters could not exceed 50 fathoms in length.

Harvest Assessment Program

The estimated subsistence salmon harvest in the Haines Management Area in 2015 was 9,151 salmon, including 5,880 sockeye salmon (64%), 2,415 pink salmon (26%), 457 chum salmon (5%), 379 coho salmon (4%), and 20 Chinook salmon (<1%) (Table 13-3). The overall salmon harvest was approximately 2,500 fish less than the 2014 harvest. Harvests of sockeye salmon decreased by almost half from 2014 harvests, while pink salmon increased by nearly 1,800 fish. Harvests of coho and Chinook salmon

3. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed June 14, 2017. http://live.laborstats.alaska.gov/pop/index.cfm
4. Alaska Department of Fish and Game Division of Commercial Fisheries, "Closure of commercial, sport, and subsistence fishing areas to conserve Chilkat River King salmon," news release, April 6, 2015. Accessed June 20, 2017. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/521760506.pdf
5. Alaska Department of Fish and Game Division of Commercial Fisheries, "Chilkat Inlet and Chilkat River subsistence salmon fishery," news release, September 28, 2015. Accessed August 9, 2016. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/495300234.pdf

decreased slightly and chum salmon harvests increased. An estimated 367 permits were fished in the Haines Management Area in 2015, a decrease from the 442 estimated permits fished in 2014.

In the Haines Borough, 406 permits were issued and 397 were returned (98%). Permits issued to residents of the city of Haines, Mud Bay, Mosquito Lake, Covenant Life, or Lutak are included in the Haines totals. In Klukwan, 10 permits were issued and 9 were returned (90%). Forty residents of Skagway were issued permits and 37 returned them (93%). In Excursion Inlet, no permits were issued. The estimated salmon harvest by Haines, Klukwan, and Skagway residents combined (8,140 salmon total) included 5,165 sockeye salmon (63%), 2,206 pink salmon (27%), 408 chum salmon (5%), 344 coho salmon (4%), and 17 Chinook salmon (<1%) (Table 13-4). Not all permits were necessarily fished in the Haines area. In 2014, 437 permits were returned and 10,028 salmon in total were reported. Compared to 2014 totals, harvests of sockeye salmon decreased the most, and harvests of pink salmon increased by the greatest number of fish.

JUNEAU MANAGEMENT AREA

The Juneau Management Area encompasses subsistence fisheries in the Angoon area and the Hoonah area, as well as personal use fisheries in the Juneau area. Subsistence and personal use harvests by residents of Elfin Cove, Tenakee Springs, Gustavus, and Pelican occur primarily, but not exclusively, in the Juneau Management Area. Management responsibility for the area rests with both the Division of Commercial Fisheries' Juneau and Sitka area offices. Overall, in 2015 there were an estimated 466 permits fished in the Juneau Management Area with an estimated harvest of 7,257 (Table 13-3). About 43 more permits were fished than in 2014 and approximately 175 more fish were harvested. Sockeye salmon harvests constituted 81% of the total harvest.

Angoon Area Subsistence Fisheries

Background and History

Subsistence salmon fisheries in the waters traditionally used by the residents of Angoon are under the management responsibility of the Division of Commercial Fisheries' Juneau and Sitka area offices. In 1989, the BOF adopted a positive C&T finding for salmon in the waters of District 12 south of a line from Fishery Point to South Passage Point and north of the latitude of Point Caution, and in waters of Section 13C east of the longitude of Point Elizabeth (5 AAC 01.716 (a)(6)).

The residents of Angoon are the principal subsistence fishers in this area. In 2015, Angoon had a population of 425, a slight increase over the 2014 population estimate.[6] Angoon Tlingit have traditionally used most of the west coast of Admiralty Island, from Hawk Inlet to the southern tip of Admiralty Island, and lands and waters of the east coasts of Chichagof and Baranof islands. Based on permit data from 1996 through 2006, as well as interviews with local fishers, the waters of Kootznahoo Inlet, Favorite Bay, and Hood Bay to the south; Mitchell Bay, Salt Lake, and Kanalku bays further east; and Chatham Strait to the west continue to provide the people of Angoon with salmon and other marine resources.

Regulations

The 2015 permit conditions did not differ from 2014, except for an increase in the possession and annual limits at Hasselborg River. The open season for sockeye salmon in Kanalku Bay and Basket Bay was from June 1–July 31, with a limit of 20 fish in possession and annually at Kanalku Bay, and 15 fish in possession with an annual limit of 30 fish in Basket Bay; in Sitkoh Bay from June 1–August 31, with a possession and annual limit of 50 fish; and in Hasselborg River–Salt Lake from July 1–August 15, with a limit of 50 fish in possession and annually. Inseason, a news release announced a 10-day extension to the closing date of Kanalku and Basket bays due to adequate escapements and a delayed development of

6. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed June 14, 2017. http://live.laborstats.alaska.gov/pop/index.cfm

sockeye salmon returns in these systems.[7] The open period for subsistence coho salmon fishing on Hasselborg River–Salt Lake was from July 1–October 31 with a possession and annual limit of 20 fish. Coho salmon could also be taken in other streams in the Angoon area with positive C&T findings from June 1–October 31, with limits of 20 in possession and 40 annually from all combined streams. Pink salmon could be harvested in all streams in the area from June 1–September 30, with a possession and annual limit of 150 fish. The season for chum salmon in all streams of the area was from June 1–October 31, and the possession and annual limit was 50 fish. Gaffs, spears, beach seines, dip nets, drift gillnets, and cast nets were the allowable subsistence gear types. Drift gillnets could not exceed 50 fathoms in length.

Harvest Assessment Program

The estimated salmon harvest in the Angoon area subsistence fisheries in 2015 was 983 salmon, including 905 sockeye salmon (92%), 43 pink salmon (4%), and 35 coho salmon (4%) (Table 13-3). Fewer sockeye salmon were harvested in 2015 than in 2014, while the harvests of pink and coho salmon increased. An estimated 55 permits were fished in the area, compared to 56 permits fished in 2014.

The estimated salmon harvest for the community of Angoon in 2015, based on 101 permits issued and 78 returned (77%), totaled 677 salmon, including 629 sockeye salmon (93%), 35 coho salmon (5%), and 13 pink salmon (2%) (Table 13-4). Not all permits were necessarily fished solely in the Angoon area. The number of permits issued in Angoon in 2015 was similar to the number issued in 2014, with a harvest of approximately 1,000 fewer fish.

Hoonah Area Subsistence Fisheries

Background and History

Subsistence salmon fisheries in the waters traditionally used by the residents of Hoonah are under the management responsibility of the Division of Commercial Fisheries' Juneau and Sitka area offices. In 1989, the BOF adopted a positive C&T finding for salmon in those waters of District 12 that are in Basket Bay west of 134º 53.88′ W. longitude; in those waters of District 13 that are along the western shore of Yakobi Island east of a line from Cape Spencer light to Surge Bay light; and in the waters of sections 14B and 14C (5 AAC 01.716 (a)(4)).

The residents of Hoonah are the principal subsistence users of the waters in the area. In 2015, Hoonah had a population of 782, essentially the same as the 2014 estimated population.[8]

Regulations

The only change made to the 2015 subsistence salmon permit for the Hoonah area was a reduction in possession and annual limits at Neva Creek. It provided open seasons and limits for sockeye salmon at the following locations: Surge Bay, Hanus Bay (Lake Eva), and Neva Creek from June 1–August 15; Hoktaheen Cove from June 1–July 20; and Berg Bay from June 1–July 31. Limits at these locations varied: 50 sockeye salmon annually and in possession were allowed at Surge and Hanus bays and at Hoktaheen Cove; a limit of 30 fish in possession and annually was in effect at Neva Creek; and Berg Bay had a limit of 25 fish annually and in possession. Pink salmon could be harvested under a subsistence permit in all streams in the Hoonah area from June 1–September 30, with a possession and annual limit of 150 fish. Chum salmon could be harvested in the same waters from June 1–October 31, with a possession and annual limit of 50 fish. Coho salmon could be taken in streams in the areas with positive C&T findings from June 1–October 31, with limits of 20 in possession and 40 annually. Gaffs, spears, beach

7. Alaska Department of Fish and Game Division of Commercial Fisheries, "Juneau Area subsistence/personal use salmon fishery announcement," news release, July 31, 2015. Accessed June 20, 2017. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/595602252.pdf
8. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed June 14, 2017. http://live.laborstats.alaska.gov/pop/index.cfm

seines, dip nets, drift gillnets, and cast nets were the types of subsistence gear allowed in the Hoonah area subsistence fisheries. Drift gillnets could not exceed 50 fathoms in length.

Harvest Assessment Program

The estimated salmon harvest in the Hoonah area subsistence fisheries in 2015 was 2,459 salmon, including 2,022 sockeye salmon (82%), 264 pink salmon (11%), 167 coho salmon (7%), and 6 chum salmon (<1%) (Table 13-3). The 2015 harvest was about 1,500 salmon greater than the 2014 harvest, more similar to the 2013 harvest. The majority of this increase came from harvests of sockeye salmon, which increased from 570 fish in 2014. An estimated 105 permits were fished in the Hoonah area in 2015 in comparison to 46 permits fished in 2014.

For the community of Hoonah, in 2015, 111 permits were issued and 81 were returned (73%) with a total estimated harvest of 1,154 salmon. Not all permits were fished solely in the Hoonah area. The harvest consisted of 996 sockeye salmon (86%), 110 coho salmon (10%), 44 pink salmon (4%), and 4 chum salmon (<1%) (Table 13-4). Slightly more permits were issued to Hoonah residents compared to 2014, but a smaller percentage of those permits were returned. The overall harvest was similar to the 2014 harvest of 1,247 fish.

Elfin Cove, Gustavus, Pelican, and Tenakee Springs Subsistence and Personal Use Salmon Fisheries

Background

Subsistence and personal use salmon fisheries in the waters traditionally used by the residents of Elfin Cove, Gustavus, Pelican, and Tenakee Springs are under the management responsibility of the Division of Commercial Fisheries' Juneau and Sitka area offices. Fishers from these communities fish primarily in districts 11, 12, 13, and 14; harvests are included in the Angoon area subsistence fisheries, Hoonah area subsistence fisheries, and Juneau area personal use fisheries categories in Table 13-3. Elfin Cove fishers harvest salmon from Hoktaheen Cove and Surge Bay in District 13. Gustavus fishers harvest salmon primarily from Surge Bay and Hoktaheen Cove in District 13, but also from the Taku River in District 11, the Berg River and Neva Creek in District 14, and the Chilkat River in District 15. Residents of Pelican and Tenakee Springs harvest salmon at Kook Creek and Kook Lake Outlet in Basket Bay, Taku River and Sweetheart Creek in District 11, and Hoktaheen Cove in District 13. Most of the salmon stocks in these areas have positive C&T findings as described in other sections of this report.

In 2015, Elfin Cove had a population of 14; Gustavus–533 residents; Pelican–79 residents; and Tenakee Springs–139 residents.[9] The populations of Elfin Cove and Pelican were essentially the same as 2014, while the populations of Gustavus and Tenakee Springs increased by 15 and 10 residents, respectively.

Regulations

Permit regulations applying to fishers in this area can be found under the Hoonah, Angoon, Haines, and Juneau subsections.

Harvest Assessment Program

In 2015, the number of salmon reported on permits issued to residents of Elfin Cove, Gustavus, Pelican, and Tenakee Springs was modest (Table 13-4). Thirty-four permits were issued to Gustavus residents, 6 permits were issued to residents of Elfin Cove, 4 permits were issued to Pelican residents, and 3 were issued to people living in Tenakee Springs. The majority of these permits were returned. No harvest was recorded on the returned Elfin Cove permits; an estimated 24 sockeye salmon were harvested in Pelican and 6 sockeye salmon in Tenakee Springs. The estimated harvest for Gustavus was 517 total salmon, an increase from 2014, when 355 fish were reported. The harvest consisted of 424 sockeye salmon (82%), 88

9. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed June 14, 2017. http://live.laborstats.alaska.gov/pop/index.cfm

pink salmon (17%), 3 chum salmon (1%) and 1 coho salmon (<1%) (Table 13-4). Not all permits were necessarily fished in the Juneau Management Area.

Juneau Area Personal Use Fisheries

Juneau fishers primarily harvest sockeye salmon from the Taku River and Sweetheart Creek in District 11, which is in the Juneau Nonsubsistence Area (Figure 13-1). These waters are under the management responsibility of the Division of Commercial Fisheries' Juneau Area office. Personal use regulations apply to salmon fishing for home uses in this area. Juneau area residents were the principal participants in the designated personal use fisheries in District 11. In 2015, the city and borough of Juneau had a population of 33,137, essentially the same as 2014.[10]

Regulations

The 2015 personal use permit conditions remained the same as 2014. The permit provided open seasons and limits for sockeye salmon at the following locations: in the Taku River from July 1–July 31, with a possession and annual limit of 5 sockeye salmon for a household of 1 person and 10 sockeye salmon for a household of 2 or more people; and in Sweetheart Creek from June 1–October 31, with a possession limit of 25 sockeye salmon and no annual limit. Inseason, a news release announced a 10-day extension to the closing date of the Taku River due to adequate escapement and a delayed development of sockeye salmon returns in the system.[11] In all streams in the Juneau Management Area, except along the Juneau road system, the open season for pink salmon was June 1–September 30 with a 150 fish limit annually and in possession; for chum salmon, the open season was June 1–October 31 with an annual and possession limit of 50 fish.

Beach seines, set and drift gillnets, cast nets, dip nets, gaffs, and spears were the types of personal use gear allowed in the Juneau area. Drift gillnets could not exceed 50 fathoms in length. Set gillnets could be used only in the Taku River, where they could not exceed 15 fathoms in length, had to be set from the Taku River Lodge upstream to the U.S.–Canada border, and could not be fished within 100 yd of the ADF&G fish wheels. Additionally, the permit holder had to be present at the net while it was in use. In Sweetheart Creek, salmon could be taken for personal use only upstream from the ADF&G regulatory marker located near the stream mouth

Harvest Assessment Program

The total estimated salmon harvest for the Juneau area personal use fisheries in 2015 was 3,815 salmon, consisting of 2,929 sockeye salmon (77%), 566 pink salmon (15%), 284 coho salmon (7%), 34 Chinook salmon (1%), and 2 chum salmon (<1%) (Table 13-3). This was a lower harvest than the 2014 harvest of 4,685 salmon. Harvests of all species increased, except sockeye salmon which decreased by approximately 1,800 fish. An estimated 306 permits were fished in the Juneau area personal use fisheries in 2015, compared to 407 permits fished in 2014.

The estimated personal use and subsistence salmon harvest for the community of Juneau (including the communities of Douglas and Auke Bay), based on 662 permits issued and 603 returned (91%), totaled 6,567 salmon, including 5,191 sockeye salmon (79%), 900 pink salmon (14%), 399 coho salmon (6%), 43 chum salmon (<1%), and 34 Chinook salmon (<1%) (Table 13-4). Not all permits were fished solely in the Juneau area. Fewer permits were issued and returned in 2015 than in 2014. Overall salmon harvests were also less in 2015: harvests of sockeye salmon decreased by over 2,000 fish, driving the overall decrease as harvests of coho, pink, and chum salmon all increased slightly.

10. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed June 14, 2017. http://live.laborstats.alaska.gov/pop/index.cfm
11. Alaska Department of Fish and Game Division of Commercial Fisheries, "Juneau Area subsistence/personal use salmon fishery announcement," news release, July 31, 2015. Accessed June 20, 2017. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/595602252.pdf

SITKA MANAGEMENT AREA

Sitka Subsistence and Personal Use Salmon Fisheries

Background and History

Subsistence and personal use salmon fisheries in the waters traditionally used by the residents of Sitka are under the management responsibility of the Division of Commercial Fisheries' Sitka Area office. In 1989, the BOF adopted a positive C&T finding for sockeye salmon in in those waters of District 13 that were along the western shore of Yakobi Island east of a line from Cape Spencer light to Surge Bay light (5 AAC 01.716 (a)(4)) as well as the waters of Section 13A south of the latitude of Cape Edward, in waters of Section 13B north of the latitude of Redfish Cape, and in waters of Section 13C (5 AAC 01.716 (a)(8)). At the March 1997 BOF meeting in Sitka, this finding was extended to include all other salmon species in all waters of District 13 (5 AAC 01.716 (a)(21)). Sockeye salmon stocks without a positive C&T finding in this area can only be fished under personal use regulations. Principal salmon waters and streams used by Sitka fishers include Klag Bay–Lake Anna, Lake Stream–Ford Arm, Necker Bay, Redoubt Bay, Salmon Lake, and Redfish Bay.

The residents of Sitka are the principal subsistence users of the salmon stocks in the area. In 2015, the city and borough of Sitka had a population of 8,920, a decrease of approximately 150 residents.[12] The Sitka Tlingit have traditionally used most of the Pacific coast of Baranof and Chichagof islands from Point Urey to Cape Ommaney, including the myriad islands lying off the coast, and up Peril Strait between Chichagof and Baranof islands into Hoonah Sound as far as Patterson Bay. Sitkans share the use of Yakobi Island and the sockeye salmon fisheries at Hoktaheen Cove and Surge Bay with the residents of Hoonah. Sitka residents' territory touches that of Angoon residents' in Peril Strait and Sitkoh Bay.

Regulations

Specific conditions on the 2015 subsistence/personal use salmon permit remained the same as in 2014, except Leo's Anchorage and Silver Bay (Salmon Lake) were no longer listed as open sockeye salmon locations. The season for sockeye salmon for all Sitka locations opened June 1 and closed between July 13 and August 31. As stated on the permit, Falls Lake and Bay closed on July 13, but was open again from July 23 to August 15. On July 20, Hoktaheen Cove, Takanis Bay, and Gut Bay closed to sockeye salmon fishing. On July 31, Small Arm Whale Bay (Politofski Lake) and other unlisted areas with positive C&T findings closed to subsistence/personal use fishing. On August 15, Klag and Surge bays, Lake Anna and Ford Arm, and Hanus Bay (Lake Eva) closed. The last areas closed on August 31 and included Necker, Redfish, Redoubt, and Sitkoh bays.

Possession and annual limits for sockeye salmon varied from 10 fish in possession and 20 fish annually at Gut Bay to 100 fish in possession and annually at Necker Bay. Sitkoh, Takanis, Surge, Klag, and Hanus bays, Hoktaheen Cove, and Small Arm Whale Bay had possession and annual limits of 50 sockeye salmon. Lake Anna and Ford Arm, and Falls Lake and Bay had possession and annual limits of 25 fish. Redfish Bay had limits of 50 in possession and 100 fish annually. For subsistence/personal use locations not listed on the permit, the possession limit and annual limit was 10 sockeye salmon. Redoubt Bay had a possession limit of 10 fish with an annual limit of 50.

In January 2003, the BOF adopted the *Redoubt Bay and Lake Sockeye Salmon Management Plan* (5 AAC 01.760). The plan provides a management approach for subsistence, sport, and commercial fisheries that target Redoubt Lake sockeye salmon based on an optimal escapement goal of 7,000–25,000 fish. As specified on the permit, by default the fishery is open from June 1–August 31 with a possession limit of 10 fish and an annual limit of 50 fish. If the projected run falls below 7,000 fish or above 10,000 fish, the season or limits will change inseason; no changes were made during the 2015 season.

12. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed June 14, 2017. http://live.laborstats.alaska.gov/pop/index.cfm

Salmon streams flowing across or adjacent to the Sitka road system were closed to subsistence/personal use fishing for coho and chum salmon. The season for chum salmon in other waters with positive C&T findings within the Sitka Management Area, except for the listed sockeye salmon streams, was July 15–October 31, with a possession and annual limit of 50 fish. Coho salmon within the Sitka Management Area could be taken under subsistence fishing permit conditions from August 16–October 31 and in Redoubt, Necker, Redfish, and Sitkoh bays from September 1–October 31 with a possession limit of 20 fish and an annual limit of 40 fish for any combination of streams. Pink salmon within the Sitka Management Area, except those sockeye salmon streams listed on the permit, could be taken under subsistence fishing permit conditions from July 15–September 30, with a possession limit of 50 fish and annual limit of 150.

Allowable subsistence gear for all areas except for Redoubt Bay included hand purse seines, beach seines, drift gillnets, dip nets, cast nets, gaffs, and spears. Cast nets were allowed in all areas except Redoubt Bay. In Redoubt Bay only, the use of rod and reel gear was allowed as subsistence gear and limitations listed in sport regulations applied to this gear. Portions of Falls Lake, Gut Bay, Silver Bay, and Indian River had closed areas and/or restricted gear types specified on the permit.

Harvest Assessment Program

As reported in Table 13-3, the estimated salmon harvest in the Sitka Management Area subsistence and personal use fisheries in 2015 was 7,752 salmon, consisting of 7,110 sockeye salmon (92%), 337 coho salmon (4%), 279 pink salmon (4%), and 26 chum salmon (<1%). This was a decrease from the 2014 harvest estimate of 12,023 fish; contributions of each species to the overall harvest remained similar, but the harvest of all species except pink salmon decreased. An estimated 241 permits were fished in the Sitka Management Area in 2015, compared to 360 permits in 2013.

As reported in Table 13-4, the estimated salmon harvest for the community of Sitka in 2015, based on 495 permits issued and 426 returned (86%), was 7,259 salmon, including 6,614 sockeye salmon (91%), 342 coho salmon (5%), 278 pink salmon (4%), and 26 chum salmon (<1%). Not all permits were fished solely in the Sitka Management Area. The number of permits issued and returned, as well as overall harvests, decreased from 2014. At the species level, harvests of sockeye decreased the most (from 8,996 fish in 2014). Harvests of pink, chum, and Chinook salmon also decreased. Three permits were issued to residents of Port Alexander; all 3 were returned providing an estimate of 100 sockeye salmon harvested.

PETERSBURG MANAGEMENT AREA

The Petersburg Management Area includes the Kake area subsistence fisheries, the Petersburg–Wrangell area personal use fisheries, the federal Stikine River subsistence fishery, and the Point Baker–Port Protection area subsistence fisheries. Overall, an estimated 278 state subsistence permits were fished in the Petersburg Management Area in 2015. The total estimated salmon harvest was 6,347 fish, with 83% of the harvest coming from sockeye salmon (Table 13-3). Fewer permits were fished in 2015 than in 2014 but 500 more salmon were harvested.

Kake Area Subsistence Fisheries

Background and History

Subsistence salmon fisheries in the waters traditionally used by the residents of Kake are under the management responsibility of the Division of Commercial Fisheries' Petersburg Area office. In 1989, the BOF adopted a positive C&T finding for salmon in the waters of sections 9A and 9B north of the latitude of Swain Point, in the waters of District 10 west of a line from Pinta Point to False Point Pybus, and in the waters of District 5 north of a line from Point Barrie to Boulder Point (5 AAC 01.716 (a)(10)). Principal salmon waters and streams used predominately by Kake fishers include Gut Bay and Falls Lake Creek on the southwest coast of Baranof Island, as well as Saginaw, Security (Salt Lake), Pillar (Kutlaku Creek), and Tebenkof (Alecks Creek) bays on Kuiu Island.

In 2015, Kake had an estimated population of 620, a decrease of 8 residents over 2014.[13] Kake residents shared the use of the southern coastal waters of Admiralty Island with residents of Angoon and Petersburg. In recent years, principal subsistence salmon fishing by Kake residents has occurred in Gut Bay and Falls Creek on Baranof Island, and at Kutlaku Creek in Pillar Bay.

Regulations

Discretionary permit conditions did not change from 2014. The 2015 subsistence salmon permit provided for an open season for sockeye salmon in Alecks Creek and Shipley Bay of June 1–July 31. In the former stream, harvest limits were set at 50 salmon in possession and annually. In the latter area, the possession limit was 25 fish and the annual limit was 50 fish. In Bay of Pillars, the open season was from June 1–August 15 with annual and possession limits of 50 fish. For Falls Lake, the open seasons were June 1–July 13 and July 23–August 15 with possession and annual limits of 25 fish. The season for sockeye salmon in Gut Bay was June 1–July 20 with a limit of 10 fish in possession and 20 fish annually. Pink, chum, and coho salmon could be harvested in all streams in the Kake area, except for the sockeye salmon streams identified on the permits. The open season for pink salmon was July 15–September 15, and there was a possession limit of 100 pink salmon and no annual limit. Chum salmon could be harvested from July 1–October 31, and there was a possession limit of 50 fish and no annual limit. The coho salmon season lasted from August 16–October 31, and there was a limit of 20 fish in possession and 40 fish annually.

Permitted subsistence gear included gaffs, spears, hand operated beach seines, dip nets, drift and set gillnets, and cast nets. Set gillnets could be used only in Shipley Bay within 100 yd of the terminus of Shipley Creek, and the permit holder was required to be physically present at the net while in operation. Gillnets could not exceed 50 fathoms in length.

Harvest Assessment Program

As reported in Table 13-3, the estimated salmon harvest in the Kake area subsistence fisheries in 2015 was 1,658 salmon, including 1,474 sockeye salmon (89%), 90 pink salmon (5%), 46 chum salmon (3%), 33 coho salmon (2%), and 16 Chinook salmon (1%). An estimated 74 permits were fished in the Kake area subsistence fisheries in 2015.This compares to an estimated 63 permits fished in 2014 with a total harvest of 1,379 salmon. The increase in overall harvests was entirely due to an increase in the sockeye salmon harvest of approximately 400 fish; harvests of all other species declined.

The estimated subsistence salmon harvest for the community of Kake in 2015, based on 156 permits issued and 130 returned (83%), was 1,618 salmon. The harvest consisted of 1,439 sockeye salmon (89%), 90 pink salmon (6%), 46 chum salmon (3%), 28 coho salmon (2%), and 16 Chinook salmon (1%) (Table 13-4). Not all permits were fished solely in the Kake area. More permits were issued in 2015 than in 2014 and the total harvest increased from an estimated 2014 harvest of 1,337 salmon. Only harvests of sockeye salmon increased, from 995 salmon in 2014. Harvests of all other species decreased slightly.

Petersburg–Wrangell Area Subsistence/Personal Use Fisheries

Background and History

Subsistence and personal use salmon fisheries in the waters traditionally used by the residents of Wrangell and Petersburg are under the management responsibility of the Division of Commercial Fisheries' Petersburg Area office. In 2002, the BOF made a positive C&T finding for salmon stocks in districts 7 and 8 (5 AAC 01.716 (a)(23)). These waters include Thoms Place, Harding River, Mill Creek, and the Stikine River. Salmon stocks in this area that do not have a positive C&T finding can be fished under personal use regulations.

13. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed June 14, 2017. http://live.laborstats.alaska.gov/pop/index.cfm

Petersburg and Wrangell residents are the principal users of the salmon stocks of Salmon Bay on Prince of Wales Island, as well as Crystal Creek, Thoms Creek, Earl West Cove, Mill Creek, and the Stikine River. In 2015, the population of the Petersburg borough (including Hobart Bay CDP and Kupreanof) was 3,185 and that of Wrangell was 2,443.[14] Both estimates are slightly lower than the 2014 estimates.

Regulations

No changes were made to the discretionary subsistence permit conditions from 2014, but possession limits did change in the Hatchery Creek personal use fishery. The 2015 permit provided an open season (June 1–July 31) for subsistence sockeye salmon in Shipley, Salmon, and Red bays, along with Thoms Place and Mill Creek. Limits for sockeye salmon were 25 in possession and 50 annually from Shipley Bay and 30 in possession and annually from Salmon Bay and Red Bay, combined. Thoms Place and Mill Creek had a combined possession limit of 20 fish and an annual limit of 40 fish.

For all streams in the Wrangell and Petersburg areas with positive C&T findings, except the sockeye salmon locations listed on the permit, subsistence fishing for pink, chum, and coho salmon was permitted. The open season for subsistence pink salmon fishing was July 15–September 15, with a daily possession limit of 100 pink salmon and no annual limit. The open season for subsistence chum salmon fishing was July 1–October 31, with a daily possession limit of 50 fish and no annual limit. Subsistence coho salmon was permitted from August 16–October 31, with a limit of 20 fish in possession and 40 annually.

Allowed subsistence and personal use gear included gaffs, spears, beach seines, dip nets, drift and set gillnets, and cast nets. Drift gillnets could not exceed 50 fathoms in length. Set gillnets could be used only in Shipley Bay within 100 yards of the terminus of Shipley Creek, and the permit holder was required to be physically present at the net while in operation. A federal subsistence permit was needed to fish the Stikine River.

Personal use regulations establish a weekly sockeye salmon season at Hatchery Creek, which drains into Sweetwater Lake. The fishery was open Thursdays through Sundays from June 4–June 28. In 2015, harvest limits were set at 6 fish daily and 12 annually. Personal use coho salmon fishing was open in Blind Slough and North Wrangell Narrows on Fridays from 6:00 AM to 8:00 PM from August 14 to September 4 with possession and annual limits of 25 fish. The Anita Bay personal use permit allowed the harvest of Chinook, chum, and coho salmon May 1–October 31 with possession and annual limits of 25 fish in any combination. Outside of this area and Blind Slough, the possession limit was 6 coho salmon. Salmon could be taken only by drift gillnets in the Anita Bay Terminal Harvest Area.

Harvest Assessment Program

The estimated salmon harvest in the Petersburg area subsistence/personal use fisheries in 2015 was 1,361 salmon, including 1,071 sockeye salmon (79%), 206 coho salmon (15%), 51 pink salmon (4%), 33 chum salmon (2%), and 1 Chinook salmon (<1%) (Table 13-3). Compared to 2014, the overall harvest was very similar. At the species level, sockeye salmon composed a greater proportion of the harvest than in 2014 and coho salmon a smaller proportion. An estimated 60 permits were fished in 2015, 20 fewer than in 2014.

As reported in Table 13-4, the estimated subsistence/personal use salmon harvest for the community of Petersburg in 2015, based on 148 permits issued and 143 returned (97%), was 2,275 salmon, including 1,869 sockeye salmon (82%), 218 coho salmon (10%), 109 pink salmon (5%), 48 chum salmon (2%), and 31 Chinook salmon (1%). Not all permits were fished solely in the Petersburg area. Fewer permits were issued and returned in 2015. The overall salmon harvest was very similar to the 2014 harvest; about 150 more sockeye salmon were harvested but harvests of the other species were slightly smaller in 2015.

14. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 9, 2017. http://live.laborstats.alaska.gov/pop/index.cfm

As shown in Table 13-3, the estimated salmon harvest in the Wrangell area subsistence/personal use fisheries in 2015 was 1,065 salmon, which included 904 sockeye salmon (85%), 75 pink salmon (7%), 69 chum salmon (7%), 14 Chinook salmon (1%), and 2 coho salmon (<1%). Compared to the 2014 harvest estimate of 1,065 salmon, the estimated overall harvest, as well as that of sockeye and coho salmon, decreased. An estimated 74 permits were fished in 2015 and 2014.

The estimated subsistence salmon harvest for the community of Wrangell in 2015, based on 184 permits issued and 163 returned (89%), was 2,395 salmon, including 1,936 sockeye salmon (81%), 188 pink salmon (8%), 121 coho salmon (5%), 94 chum salmon (4%), and 55 Chinook salmon (2%) (Table 13-4). Not all permits were fished solely in the Wrangell area. Harvests were greater than the estimated 2014 harvest of 2,068 fish; harvests of sockeye, pink, and chum salmon increased from 2014.

2015 Federal Stikine River Subsistence Salmon Fishery: Regulations

In January 2004, the U.S. and Canada negotiated a modified Pacific Salmon Treaty that allowed for a U.S. subsistence salmon fishery on the Stikine River. The Federal Subsistence Board implemented a Stikine River subsistence sockeye salmon fishery in 2004, followed by directed Chinook and coho salmon subsistence fisheries authorized in 2005. Regulatory changes implemented for the 2006 season included an increase in the mesh size of gillnets during the Chinook salmon fishery and an earlier starting date for the sockeye salmon fishery. In 2008, 2 additional regulatory changes were made: subsistence fishing permits became valid for the entire season (May 15–October 1); and the start date of the coho salmon fishery was moved up to August 1. The latter change allowed a continuous subsistence fishery throughout the season. Effective for the 2015 season, the Federal Subsistence Board adopted a new regulation requiring subsistence fishermen to check their nets at least twice daily. Emergency Special Actions restricted Chinook salmon fishing in 2013 and 2014, but no such restrictions were enacted in 2015.

Current Federal Regulations

The federal subsistence fisheries regulatory year begins April 1. Regulations are detailed in Subpart C and D of the *Code of Federal Regulations* (36 CFR part 242 and 50 CFR part 100). The sections relevant to the Stikine River are as follows:

50 CFR 100.24 Customary and traditional use determinations.

(2) Fish determinations. The following communities and areas have been found to have a positive customary and traditional use determination in the listed area for the indicated species:

Southeastern Alaska Area:

District 8 and waters draining into that District: Salmon, Dolly Varden, trout, smelt, and eulachon. Residents of drainages flowing into Districts 7 & 8, residents of drainages flowing into District 6 north of the latitude of Point Alexander (Mitkof Island), and residents of Meyers Chuck.

36 CFR 242.27 Subsistence taking of fish.

(e) Fishery management area restrictions.

(13) Southeastern Alaska Area.

(xiii) You may take Chinook, sockeye, and coho salmon in the mainstem of the Stikine River only under the authority of a Federal subsistence fishing permit. Each Stikine River permit will be issued to a household. Only dip nets, spears, gaffs, rod and reel, beach seine, or gillnets not exceeding 15 fathoms in length may be used. The maximum gillnet mesh size is 5½ inches, except during the Chinook season when the maximum gillnet mesh size is 8 inches.

(A) You may take Chinook salmon from May 15 through June 20. The annual limit is 5 Chinook salmon per household.

(B) You may take sockeye salmon from June 21 through July 31. The annual limit is 40 sockeye salmon per household.

(C) You may take coho salmon from August 1 through October 1. The annual limit is 20 coho salmon per household.

(D) You may retain other salmon taken incidentally by gear operated under terms of this permit. The incidentally taken salmon must be reported on your permit calendar.

(E) The total annual guideline harvest level for the Stikine River fishery is 125 Chinook, 600 sockeye, and 400 coho salmon. All salmon harvested, including incidentally taken salmon, will count against the guideline for that species.

Seasons, harvest limits, and the C&T determinations enumerated in regulations are also included on the federal subsistence fishing permit for the Stikine River. In addition, the permit specifies several other limitations:

- allowable gear—Gillnets not exceeding 15 fathoms in length may be used. The maximum gillnet mesh size is 5 1/2 inches, except during the Chinook season when the maximum gillnet mesh size is 8 inches;
- size—"Jack" Chinook salmon are defined as less than 28 inches. Only Chinook salmon equal to or greater than 28 inches are included in the annual harvest limit. Fishers must indicate the number of Chinook salmon taken that are greater than and less than 28 inches separately.
- harvest recording—Fishers may retain other salmon taken incidentally; however, they must be recorded on the permit.

The total annual harvest level for the Stikine River is controlled by the inseason manager and may be closed or expanded by special action.

Harvest Assessment Program

For Chinook, coho, and sockeye salmon fisheries harvest assessment, a telephone-based monitoring program with a random subset of permit holders is used inseason, with permits and harvest reporting used for overall harvest assessment postseason. Similar to 2014, in 2015, 125 fishing permits were issued, with 59% going to Wrangell households and 41% to Petersburg households (Table 13-5). All 125 issued permits were returned. An estimated 70 permits were fished. The Stikine River subsistence harvest totaled 2,263 salmon, above the 2014 harvest, the 5-year average harvest, and the historical harvest (Table 13-6). The 2015 harvest consisted of 1,844 sockeye salmon (81%), 171 pink salmon (8%), 131 coho salmon (6%), 71 Chinook salmon (3%), and 46 chum salmon (2%) (Table 13-6). There were also 6 Dolly Varden char harvested.[15] Compared to 2014, a similar number of permit holders caught more salmon overall. Harvests of sockeye and pink salmon increased while harvests of Chinook, chum, and coho salmon all decreased slightly from 2014.

Residents of Petersburg were issued 51 permits in 2015; all were returned. Based on the permit data, residents of Petersburg harvested 926 salmon in the federal fishery, approximately 41% of the entire harvest. The catch comprised 805 sockeye salmon (87%), 58 pink salmon (6%), 30 Chinook salmon (3%), 21 chum salmon (2%), and 12 coho salmon (1%) (Table 13-5). In Wrangell, based on 74 permits issued and returned, 1,337 salmon were harvested. The catch consisted of 1,039 sockeye salmon (78%), 119 coho salmon (9%), 113 pink salmon (8%), 41 Chinook salmon (3%), and 25 chum salmon (2%) (Table 13-5). Compared to 2014, Petersburg residents harvested 35 fewer fish while Wrangell residents harvested 350 more fish.

15. Robert Larson, USFS. Stikine River subsistence salmon fishery: 2015 season summary. United States Department of Agriculture Forest Service, unpublished report, 2015.

Point Baker–Port Protection Subsistence Fisheries

Background and History

The Division of Commercial Fisheries' Petersburg Area office manages subsistence and personal use salmon fisheries in the waters used by fishers from the communities of Point Baker and Port Protection. These fishers rely especially on the Salmon Bay and Red Bay sockeye salmon stocks at the northern end of Prince of Wales Island. In 1997, the BOF adopted a positive C&T finding for salmon and other fishes in the waters of District 5 north of a line from Point St. Albans to Cape Pole, in the waters of Section 6A west of a line from Macnamara Point to Mitchell Point, and in the waters of Section 6B west of the longitude of Macnamara Point (5 AAC 01.716 (a)(20)). Harvests in these waters are included in the Petersburg area subsistence-personal use fisheries category in Table 13-3.

In 2015, Point Baker had a population of 14 and Port Protection had a population of 53; both estimates are similar to 2014 estimates.[16]

Regulations

The Point Baker drift gillnet subsistence sockeye salmon fishery occurs in the waters of Sumner Strait within 3 miles of the Prince of Wales Island shoreline north of Hole-in-the-Wall and west of the western side of Buster Bay. The fishery was open Wednesdays at 12:00 PM to Sundays at 12:00 PM, from June 10–July 31. Only drift gillnet gear, not to exceed 50 fathoms in length, was allowed. Harvest was limited to 25 sockeye salmon in possession and annually. Pink and chum salmon subsistence harvests were allowed in all streams within the Point Baker–Port Protection area for stocks with positive C&T findings, except for the sockeye salmon streams identified on the permit. There was a 100-fish possession limit for pink salmon, with no annual limit. For chum salmon, 50 fish were allowed in possession with no annual limit. Coho salmon could be harvested under subsistence regulations for stocks with positive C&T findings in all streams in the Point Baker–Port Protection area with a possession limit of 20 fish and annual limit of 40 fish.

Harvest Assessment Program

Port Protection households maintain either a Ketchikan or Point Baker post office address and can also receive mail via private carrier from Ketchikan. Port Protection harvests can be included in either the Point Baker or Ketchikan harvest estimates. In 2015, 1 permit was issued in Port Protection and 4 were issued in Point Baker. Three permits were returned in Point Baker with a total harvest of 5 chum salmon and 1 sockeye salmon (Table 13-4). In Port Protection, the returned permit showed no harvest.

KETCHIKAN MANAGEMENT AREA

The Ketchikan Management Area includes subsistence fisheries in the Hydaburg area, the Craig-Klawock area, and the Kasaan area, and personal use fisheries outside of these three areas as well as in the Ketchikan area. All of these areas are under the management responsibilities of the Division of Commercial Fisheries' Ketchikan Area office. There were an estimated 380 permits fished in the Ketchikan Management Area in 2015, more than the 319 permits fished in 2014. The total estimated salmon harvest was 12,036, significantly more than the 2014 estimate of 8,066 salmon (Table 13-3). Sockeye salmon harvests contributed 86% of this harvest; in 2014 sockeye salmon contributed 80% to the overall salmon harvest.

16. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed June 14, 2017. http://live.laborstats.alaska.gov/pop/index.cfm

Craig, Klawock, and Hydaburg Subsistence Fisheries

Background and History

Hydaburg area waters with a positive C&T finding for salmon include Section 3A and the waters of District 2 in Nichols Bay north of lat. 54º 42.12′ N (5 AAC 01.716 (a)(18)). Craig–Klawock area waters with a positive C&T finding for salmon include Section 3B east of a line from Point Ildefonso to Tranquil Point; Warm Chuck Inlet north of a line from a point on Heceta Island at lat. 55º 44′ N, long. 133º 25′ W to Bay Point; Section 3C in Karheen Passage north of lat. 55º 48′ N and east of long. 133º 20′ W; and Sarkar Cove and the Sarkar lakes (5 AAC 01.716 (a)(15)).

Residents of the communities of Hydaburg, Craig, and Klawock on the west coast of Prince of Wales Island primarily use the salmon stocks of sections 3A and 3B, with the main harvest locations at Hetta Inlet–Sukkwan Strait (Eek Creek), Big Salt–Trocadero Bay (Klawock River), and Sea Otter Sound (Sarkar River).

In 2015, Craig had a population of 1,181, Klawock had a population of 821, and Hydaburg had a population of 402.[17] Estimates for the Craig and Hydaburg are slightly lower than the 2013 estimates while Klawock's is slightly higher.

Regulations

The 2015 subsistence sockeye salmon schedule in the Klawock River was from Monday at 8:00 AM to Friday at 5:00 PM from July 7–August 7, with a 20 sockeye salmon possession limit and no annual limit; in Hetta Inlet and Eek Creek, the season was June 1–August 31 with a possession limit of 20 sockeye salmon and no annual limit,; and in Hugh Smith Lake and Naha River fishing was open June 22–July 31 with a 12 sockeye salmon possession limit and no annual limit in the former system but a 20 fish annual limit in the latter. Karta River, Klakas Lake, and Sarkar were open from June 1 to July 31. The possession limit in each of the 3 systems was 20 fish; Karta River and Klakas Lake had no annual limit but Sarkar had a 40 fish limit. Other systems in the Ketchikan Management Area with positive C&T findings for salmon were open to sockeye salmon fishing June 1–July 31, with a 10 sockeye salmon possession limit and a 25 sockeye salmon annual limit. Such streams had to be approved by ADF&G and listed on the permit. All streams in the Ketchikan Management Area with positive customary and traditional use findings were open for pink salmon July 1–September 30 with a 150 fish possession limit and no annual limit. Chum and coho salmon fishing was open in the same waters July 1–October 31 with a possession limit of 25 chum and 20 coho salmon. There was no annual limit for chum salmon, but there was a 40 coho salmon limit annually. Additional conditions on the 2015 subsistence/personal use salmon permit for the Ketchikan Management Area stipulated that hand purse seines, beach seines, gillnets, spears, gaffs, cast nets, and dip nets were allowable subsistence/personal use gear. Gillnets were allowed in Yes Bay, Kendrick Bay, Nakat Inlet, and Neets Bay but could not exceed 50 fathoms in length. Herring Bay gillnets could not exceed 10 fathoms in length, with no mesh size restrictions. A beach seine could not obstruct more than one-half the width of any fish stream and any channel or side channel of a fish stream, including the estuary leading to a fish stream. Sockeye salmon could not be retained as incidental catch.

Harvest Assessment Program

The estimated salmon harvest for the Craig–Klawock–Hydaburg area subsistence fisheries in 2015 was 2,744 salmon, including 2,240 sockeye salmon (82%), 315 coho salmon (11%), 115 pink salmon (4%), and 74 chum salmon (3%) (Table 13-3). The 2015 harvest decreased from 2,866 fish in 2014. Sockeye and coho salmon harvests decreased by 150 fish and 81 fish, respectively. Harvests of chum and pink salmon increased. An estimated 81 permits were fished in the area in 2015, down from 107 fished permits in 2014.

17. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 9, 2016. http://live.laborstats.alaska.gov/pop/index.cfm

As reported in Table 13-4, 100 permits were issued to residents of Craig and 72 (72%) were returned. The total estimated salmon harvest of Craig residents was 1,554, more than doubling the 2014 harvest estimate. By species, the estimated harvest consisted of 1,364 sockeye salmon (88%), 125 pink salmon (8%), 44 coho salmon (3%), and 21 chum salmon (1%). The total estimated salmon harvest for Klawock, based on 112 permits issued and 68 returned (61%), was 2,877 fish, nearly doubling the 2014 harvest of 1,461 salmon. The 2015 harvest consisted of 2,548 sockeye salmon (89%), 262 coho salmon (9%), 63 pink salmon (2%), and 5 chum salmon (<1%). The total estimated salmon harvest for Hydaburg, based on 50 permits issued and 28 returned (56%), was 1,316 salmon, the majority of which were sockeye salmon (1,152; 88%). Hydaburg residents also harvested an estimated 77 pink salmon (6%), 63 chum salmon (5%), and 25 coho salmon (2%). Not all harvests necessarily occurred in the Craig-Klawock-Hydaburg area. While harvests in all three communities increased, Hydaburg harvests showed the smallest increase. In 2014, the estimated harvest of salmon by Hydaburg residents was 732, almost entirely sockeye salmon. Fewer permits were issued in Craig, the number of permits issued in Hydaburg and Klawock only varied by 1 permit.

Kasaan Area Subsistence Fisheries

Background and History

There is a positive C&T finding for salmon in waters on the east coast of Prince of Wales Island for the Kasaan area waters of District 2 north of the latitude of the northernmost tip of Chasina Point then west of a line from the northernmost tip of Chasina Point to the easternmost tip of Grindall Island to the easternmost tip of the Kasaan Peninsula (5 AAC 01.716 (a)(12)). Salmon fishing in all other marine waters along the east coast of Prince of Wales Island occurs under personal use and sport regulations. The principal waters used for personal use salmon fishing along the eastern coast of Prince of Wales Island are Kegan Lake, the Thorne River, and Hatchery Creek–Sweetheart Creek. The personal use fisheries are described in the Ketchikan Area Personal Use Fisheries section.

In 2015, Coffman Cove had a population of 195, Edna Bay's population was 48, Hollis had a population of 113, Kasaan's population was 80, the population of Naukati Bay was 103, Thorne Bay's population was 515, and the population of Whale Pass was 47.[18] Except for Naukati Bay and Thorne Bay, these estimates are all slightly higher than those in 2014.

Regulations

All streams in the Ketchikan Management Area with positive C&T findings not otherwise listed on the permit were open for subsistence sockeye salmon fishing June 1–July 31, with a 10 fish possession limit and a 25 fish annual limit. All streams with a positive C&T determination were open to pink salmon fishing July 1–September 30, with a limit of 150 fish in possession and no annual limit. Coho and chum salmon fishing was also open in these waters July 1–October 31, with a limit on coho salmon harvests of 20 fish in possession and 40 fish annually. The limit on chum salmon harvests was 25 fish in possession and no annual limit.

Allowable gear in the subsistence fishery included hand purse seines, beach seines, spears, gaffs, cast nets, and dip nets. Salmon could not be taken with a line attached to a rod or pole. Sockeye salmon could not be retained as incidental catch.

Harvest Assessment Program

As reported in Table 13-3, in 2015 an estimated 149 permit holders fished in the Kasaan area subsistence fisheries with an estimated salmon harvest of 4,993 salmon. In 2014, only 49 permits were fished in the area with a harvest of 960 fish. The 2015 harvest included 4,560 sockeye salmon (91%), 321 pink salmon (6%), 83 coho salmon (2%), and 29 chum salmon (1%).

18. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 9, 2016. http://live.laborstats.alaska.gov/pop/index.cfm

Based on 17 permits issued to residents of Kasaan and 12 returned (71%) in 2015, an estimated 354 salmon were harvested, the majority consisting of sockeye salmon (336; 95%) as well as 16 coho salmon and 3 pink salmon (Table 13-4). Thorne Bay residents were issued 18 permits, 14 of which were returned (78%), resulting in a harvest estimate of 58 salmon, including 31 sockeye salmon and 27 pink salmon (Table 13-4). Seven permits were issued to Naukati Bay residents and 3 were returned. An estimated 47 sockeye salmon were harvested. In Hollis, 24 permits were issued and 18 were returned (75%). An estimated 816 salmon were harvested, including 655 sockeye salmon (80%), 107 pink salmon (13%), 41 coho salmon (5%), and 13 chum salmon (2%). In Coffman Cove, 9 permits were issued and 6 were returned (67%) with no salmon harvest reported. One permit was issued in Whale Pass but was not returned. Not all permits were fished solely in their respective areas. Estimated harvests in half the communities increased (Kasaan, Naukati Bay, Hollis) and decreased in half (Thorne Bay, Coffman Cove, Whale Pass) from 2014.

Ketchikan Area Personal Use Fisheries

Background and History

The Division of Commercial Fisheries' Ketchikan Area office is responsible for oversight of the subsistence and personal use salmon fisheries in districts 1, 2, 3, and 6. Some waters within sections 1A, 1C, 1D, 1E, 1F, and District 2 fall within the Ketchikan Nonsubsistence Area (Figure 13-1). The BOF made a positive C&T finding for salmon stocks in the waters traditionally used by the Tongass Tlingit of Saxman. These waters include the Naha River, Boca de Quadra in the waters of Sockeye Creek and Hugh Smith Lake, as well as the salt waters within 500 yards of the terminus of Sockeye Creek (5 AAC 01.716 (a)(19)).

The communities of Ketchikan and Saxman are the principal users of the fisheries in the Ketchikan area. In 2015, the population of the Ketchikan borough, excluding Saxman, was 13,397. Saxman, located within the Ketchikan Gateway Borough, had a population of 413.[19] 2015 estimates show a similar but slightly smaller population in both communities as in 2104.

Regulations

The 2015 subsistence/personal use salmon permit for the Ketchikan Management Area provided for a July 1–August 30 open season for sockeye salmon at McDonald Lake (Yes Bay), with a possession and annual limit of 30 fish. Kegan Lake and Thorne River were open from June 1–July 31, with a possession limit of 12 sockeye salmon and an annual limit of 50 sockeye salmon. Hatchery Creek was open June 4–June 28, Thursdays through Sundays, with a limit of 6 sockeye salmon in possession and 12 annually. Other streams in the Ketchikan Management Area that were open to personal use fishing, except the Ketchikan road system, were open June 1–July 31 with a limit of 10 sockeye salmon in possession and a 25 fish annual limit. Leask Creek and Mahoney creek and lake, and marine waters within 500 yards of the terminus of these streams, remained closed. For pink and chum salmon, all stocks in streams with no positive C&T finding within the Ketchikan Management Area, except the Ketchikan road system, were open to personal use fishing. The season for pink salmon ran from June 1–September 30 with a limit of 150 fish in possession and no annual limit. For chum salmon, the open season was from June 1–October 31 with a possession limit of 25 and no annual limit. The season for Chinook salmon ran from July 1 to August 30 in the Herring Bay Terminal Harvest Area only; the possession limit was 50 fish with no annual limit. Sockeye salmon could not be retained as incidental catch. The legal gear types specified under the terms of this permit included hand purse seines, beach seines, gillnets, spears, gaffs, cast nets, and dip nets. Gillnets were allowed only in Yes Bay, Kendrick Bay, Nakat Inlet, and Neets Bay; they could not exceed 50 fathoms in length. Herring Bay gillnets could not exceed 10 fathoms in length, with

19. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 9, 2016. http://live.laborstats.alaska.gov/pop/index.cfm

no mesh size restrictions. A beach seine could not obstruct more than one-half the width of any fish stream and any channel or side channel of a fish stream, including the estuary leading to a fish stream.

Harvest Assessment Program

The total estimated salmon harvest in the Ketchikan area personal use fisheries in 2015 was 4,298 fish, including 3,488 sockeye salmon (81%), 406 chum salmon (9%), 354 pink salmon (8%), 35 coho salmon (1%), and 15 Chinook salmon (<1%) (Table 13-3). An estimated 151 personal use permits were fished. In comparison, the 2014 harvest was of 4,240 salmon, with similar composition except for coho salmon which decreased from an estimated harvest of 235 fish.

As reported in Table 13-4, the total estimated salmon harvest for the community of Ketchikan , based on 256 permits issued and 190 returned (74%), was 4,407, including 3,580 sockeye salmon (81%), 388 chum salmon (9%), 385 pink salmon (9%), 40 coho salmon (1%), and 13 Chinook salmon (<1%). In Saxman, based on 22 permits issued and 16 returned (73%), a total of 479 salmon were harvested. Of the total, sockeye salmon constituted the largest proportion at 448 fish (94%) followed by chum salmon with 19 fish (4%), 7 pink salmon (1%), and 3 coho salmon (1%). Only 1 permit was issued to Metlakatla residents and it was not returned. Fewer permits were issued in each community but harvests increased in Ketchikan and Saxman.

Table 13-1.–Subsistence and personal use salmon harvests by district, Southeast region, 2015.

Fishing location	Name	Permits fished		Estimated salmon harvest					
		Reported	Estimated	Chinook	Sockeye	Coho	Chum	Pink	Total
District 1	Ketchikan-Behm Canal	243	328	15	3,488	35	406	354	4,298
District 2	Clarence Strait-East Prince of Wales Island	205	299	0	4,551	83	29	321	4,984
District 3	Inside Waters-West Prince of Wales Island	115	187	0	2,240	315	74	115	2,744
District 5	Sumner Strait	101	110	1	1,172	166	33	72	1,443
District 6	East Sumner Strait-North Frederick Sound	95	117	14	812	2	69	54	952
District 7	East Etolin Island-Wrangell Island-Ernest Sound	2	2	0	0	40	0	0	40
District 8	Stikine River	74	89	16	1,452	33	46	52	1,598
District 9	South Chatham Strait-West Frederick Sound	2	2	0	22	0	0	38	60
District 10	East Frederick Sound	358	393	34	2,929	284	2	566	3,815
District 11	Juneau-Taku Inlet-Stephens Passage	55	67	0	892	35	0	43	970
District 12	Angoon-North Chatham Strait-East Chichagof	370	432	0	8,763	338	26	303	9,429
District 13	Sitka-Outer Baranof and Chichagof-Peril Strait	79	91	0	383	165	6	240	794
District 14	Icy Strait-Glacier Bay	938	973	20	5,880	379	457	2,415	9,151
District 15	Lynn Canal-Chilkat Inlet	4	4	29	0	0	0	0	29
Yakutat Forelands	Yakutat Forelands	160	169	19	3,892	795	7	164	4,877
Yakutat Bay-Troll	Yakutat Bay-Troll	130	137	274	418	177	1	0	870
Yakataga	Yakataga	1	1	0	0	11	0	0	11
Subtotal, state permit fisheries		**–**	**–**	**422**	**36,894**	**2,859**	**1,156**	**4,737**	**46,068**
Stikine River	Stikine River Federal Fishery	70	70	71	1,844	131	46	171	2,263
Total		**–**	**–**	**493**	**38,738**	**2,990**	**1,202**	**4,908**	**48,331**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

– Fishers with permits may fish at more than one location. As a result, the total number of permits cannot be derived simply by adding column values.

Table 13-2.–Historical subsistence and personal use salmon harvests, Southeast region, 1985–2015.

	Permits		Estimated salmon harvest					
Year[a]	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1985	ND	1,271	19	20,006	360	2,951	2,136	25,472
1986	ND	1,354	29	21,974	277	2,840	971	26,091
1987	ND	1,322	34	25,405	117	3,878	1,474	30,908
1988	ND	1,013	94	19,898	97	3,013	1,145	24,247
1989	ND	1,479	580	32,860	1,381	3,113	3,664	41,598
1990	ND	1,543	524	36,376	1,615	3,433	3,529	45,477
1991	ND	1,554	262	37,765	766	3,271	1,741	43,805
1992	ND	1,860	614	53,131	4,939	3,201	2,942	64,827
1993	ND	2,121	537	56,249	3,515	2,583	2,143	65,027
1994	ND	2,239	800	57,097	3,607	4,211	3,639	69,354
1995	ND	2,005	1,203	45,087	3,702	3,370	3,215	56,577
1996	4,172	3,341	1,170	69,216	3,090	5,553	3,204	82,233
1997	4,211	3,529	780	58,782	2,701	4,515	4,080	70,858
1998	4,273	3,629	1,082	62,551	3,264	6,442	3,910	77,250
1999	4,308	3,717	1,393	56,618	1,933	5,557	3,280	68,782
2000	3,771	3,170	1,359	52,867	2,151	3,414	2,619	62,411
2001	3,605	3,116	1,457	55,157	3,266	3,968	4,230	68,080
2002	3,326	2,732	1,857	56,379	3,176	2,183	3,210	66,804
2003	3,595	2,924	1,543	64,670	3,052	6,275	3,894	79,434
2004	3,703	3,235	1,583	61,419	2,446	3,151	3,164	71,763
2005	3,304	2,772	887	39,694	2,283	1,831	4,959	49,655
2006	3,405	2,809	1,356	54,862	1,873	1,731	3,603	63,425
2007	3,156	1,622	1,199	43,100	1,444	721	3,273	49,737
2008	3,153	2,820	1,052	41,548	3,555	1,421	1,897	49,472
2009	3,421	3,097	1,208	49,507	3,616	2,006	3,290	59,627
2010	2,217	1,829	1,828	52,258	3,885	878	3,721	62,571
2011	3,315	2,918	916	41,733	3,060	1,147	5,494	52,350
2012	3,397	2,983	816	51,729	3,322	1,233	2,838	59,938
2013	3,564	3,170	983	49,547	3,799	1,417	3,597	59,343
2014	3,438	3,035	1,013	44,786	3,353	986	2,368	52,507
2015	3,148	2,694	493	38,738	2,990	1,202	4,908	48,331
5-year average (2010–2014)	3,186	2,787	1,111	48,011	3,484	1,132	3,604	57,342
10-year average (2005–2014)	3,237	2,706	1,126	46,876	3,019	1,337	3,504	55,862
Historical average (1985–2014)	3,544	2,474	939	47,076	2,521	3,010	3,108	56,654

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

a. For years prior to 1996, only permits returned with harvest data were included, and harvests reported in these years were not expanded into estimates. Caution should be used if comparing pre-1996 data with later data.

ND = no data.

Table 13-3.–Estimated subsistence and personal use salmon harvests by management and fishery, Southeast region, 2015.

Area	Permits fished		Estimated salmon harvest					
	Reported	Estimated	Chinook	Sockeye	Coho	Chum	Pink	Total
Yakutat Management Area	93	98	323	4,310	982	8	164	5,788
Haines Management Area	353	367	20	5,880	379	457	2,415	9,151
Juneau Management Area	413	466	34	5,857	486	8	872	7,257
Juneau Personal Use Area	279	306	34	2,929	284	2	566	3,815
Angoon Subsistence Area	45	55	0	905	35	0	43	983
Hoonah Subsistence Area	89	105	0	2,022	167	6	264	2,459
Sitka Management Area	208	241	0	7,110	337	26	279	7,752
Petersburg Management Area	248	278	101	5,293	372	194	387	6,347
Petersburg Subsistence-Personal Use Area	56	60	1	1,071	206	33	51	1,361
Wrangell Subsistence-Personal Use Area	60	74	14	904	2	69	75	1,065
Kake Subsistence Area	62	74	16	1,474	33	46	90	1,658
Stikine River Federal Subsistence Fishery	70	70	71	1,844	131	46	171	2,263
Ketchikan Management Area	265	380	15	10,288	433	509	790	12,036
Ketchikan Personal Use Area	112	151	15	3,488	35	406	354	4,298
Kasaan Subsistence Area	103	149	0	4,560	83	29	321	4,993
Craig-Klawock-Hydaburg Subsistence Area	50	81	0	2,240	315	74	115	2,744
Total	**–**	**–**	**493**	**38,738**	**2,990**	**1,202**	**4,908**	**48,331**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

– Fishers with permits may fish at more than one location. As a result, the total number of permits cannot be derived simply by adding column values.

Table 13-4.–Subsistence and personal use salmon harvests by community of residence, Southeast region, 2015.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Anchorage	18	15	5	146	4	6	7	168
Angoon	101	78	0	629	35	0	13	677
Auke Bay	4	4	0	44	0	0	2	46
Barrow	1	1	0	0	0	0	0	0
Coffman Cove	9	6	0	0	0	0	0	0
Craig	100	72	0	1,364	44	21	125	1,554
Denali National Park	1	1	0	4	0	0	0	4
Douglas	55	53	4	304	79	2	113	502
Edna Bay	1	1	0	0	0	0	0	0
Elfin Cove	6	5	0	0	0	0	0	0
Fairbanks	8	7	0	133	0	1	24	158
Galena	1	1	0	0	0	0	0	0
Gustavus	34	30	0	424	1	3	88	517
Haines	406	397	17	4,748	314	396	2,055	7,530
Healy	1	0	0	0	0	0	0	0
Hollis	24	18	0	655	41	13	107	816
Hoonah	111	81	0	996	110	4	44	1,154
Hydaburg	50	28	0	1,152	25	63	77	1,316
Juneau	603	546	30	4,843	320	41	785	6,019
Kake	156	130	16	1,439	28	46	90	1,618
Kasaan	17	12	0	336	16	0	3	354
Kenai	1	1	0	0	2	0	0	2
Ketchikan	256	190	13	3,580	40	388	385	4,407
Klawock	112	68	0	2,548	262	5	63	2,877
Klukwan	10	9	0	224	30	12	26	292
Metlakatla	1	0	0	0	0	0	0	0
Naknek	1	1	0	0	0	0	0	0
Naukati Bay	7	3	0	47	0	0	0	47
Palmer	2	2	0	35	0	0	0	35
Pelican	4	3	0	24	0	0	0	24
Petersburg	148	143	31	1,869	218	48	109	2,275
Point Baker	4	3	0	1	0	5	0	7
Port Alexander	3	3	0	100	0	0	0	100
Port Protection	1	1	0	0	0	0	0	0
Saxman	22	16	1	448	3	19	7	479
Sitka	495	426	0	6,614	342	26	278	7,259
Skagway	40	37	0	192	0	0	125	318
Tenakee Springs	3	3	0	6	0	0	6	12
Thorne Bay	18	14	0	31	0	0	27	58
Trapper Creek	1	1	0	0	0	0	0	0
Wasilla	3	3	0	15	0	0	0	15
Whale Pass	1	0	0	0	0	0	0	0
Willow	1	1	0	0	0	0	0	0
Wrangell	184	163	55	1,936	121	94	188	2,395
Yakutat	123	117	321	3,851	956	8	162	5,297
Total	**3,148**	**2,694**	**493**	**38,738**	**2,990**	**1,202**	**4,908**	**48,331**

Source ADF&G Division of Subsistence, ASFDB 2016 (ADF&G 2017).

Table 13-5.–Subsistence salmon harvests by community of residence for the federal Stikine River subsistence salmon fishery, Southeast region, 2015.

	Permits		Estimated salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Petersburg	51	51	30	805	12	21	58	926
Wrangell	74	74	41	1,039	119	25	113	1,337
Total	**125**	**125**	**71**	**1,844**	**131**	**46**	**171**	**2,263**

Source Larson (2016).

Table 13-6.– Historical subsistence salmon harvests for the federal Stikine River subsistence salmon fishery, Southeast region, 2004–2015.

	Permits	Estimated salmon harvest					
Year	issued	Chinook	Sockeye	Coho	Chum	Pink	Total
2004	40	12	243	0	11	22	288
2005	35	15	252	53	22	69	411
2006	48	37	390	21	20	23	491
2007	44	36	244	23	11	59	373
2008	50	25	428	42	12	18	525
2009	80	31	723	21	46	66	887
2010	107	61	1,653	135	37	60	1,946
2011	129	66	1,741	40	74	189	2,110
2012	130	53	1,302	112	47	32	1,546
2013	124	101	1,655	186	87	156	2,185
2014	125	86	1,527	143	60	82	1,898
2015		71	1,844	131	46	171	2,263
5-year average (2010–2014)	114	73	1,576	123	61	104	1,937
Historical average (2004–2014)	79	51	992	78	42	75	1,237

Source Larson (2016).

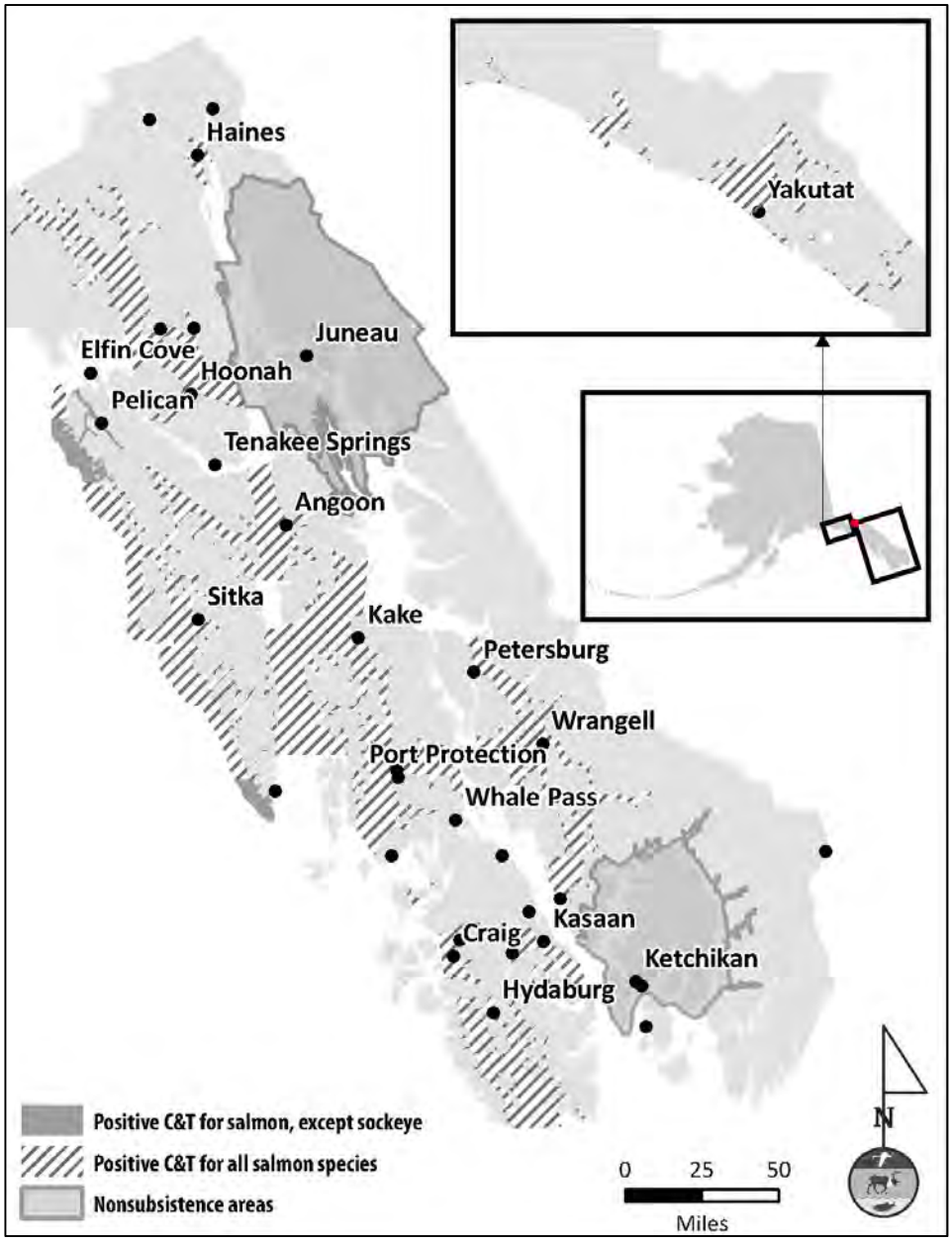

Figure 13-1.–Customary and traditional use findings for salmon, and nonsubsistence areas, Southeast region, 2015.

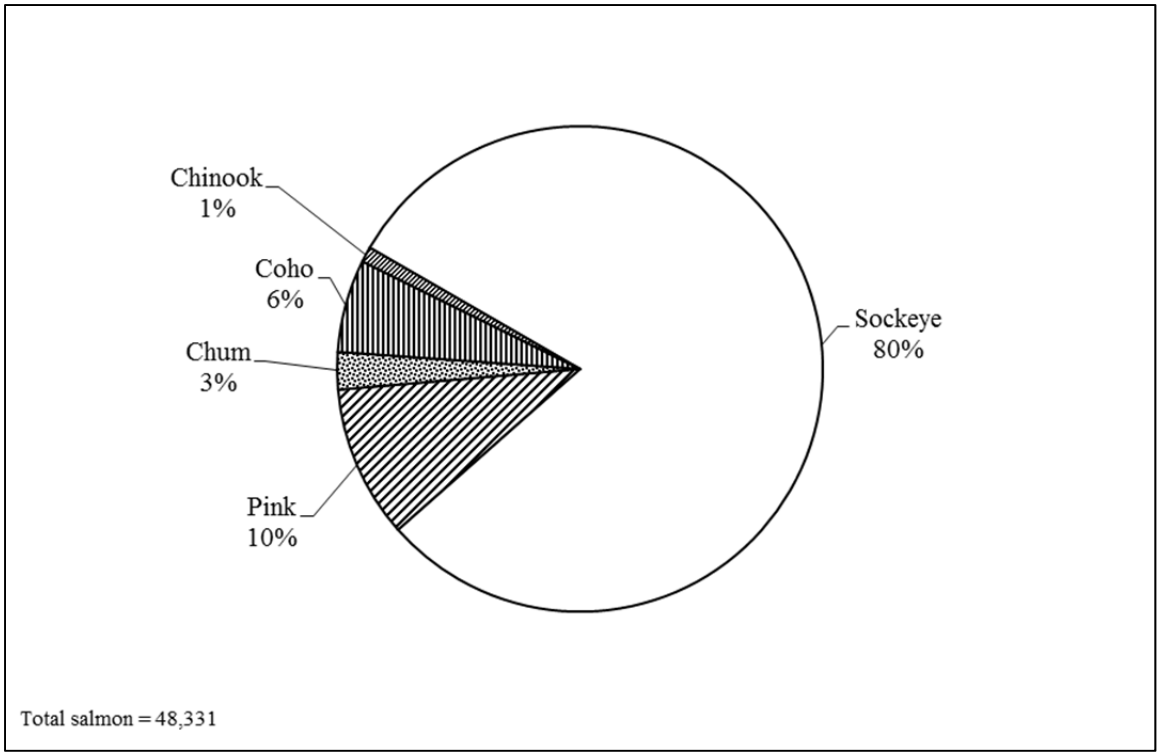

Figure 13-2.–Southeast region subsistence and personal use harvests by species, 2015.

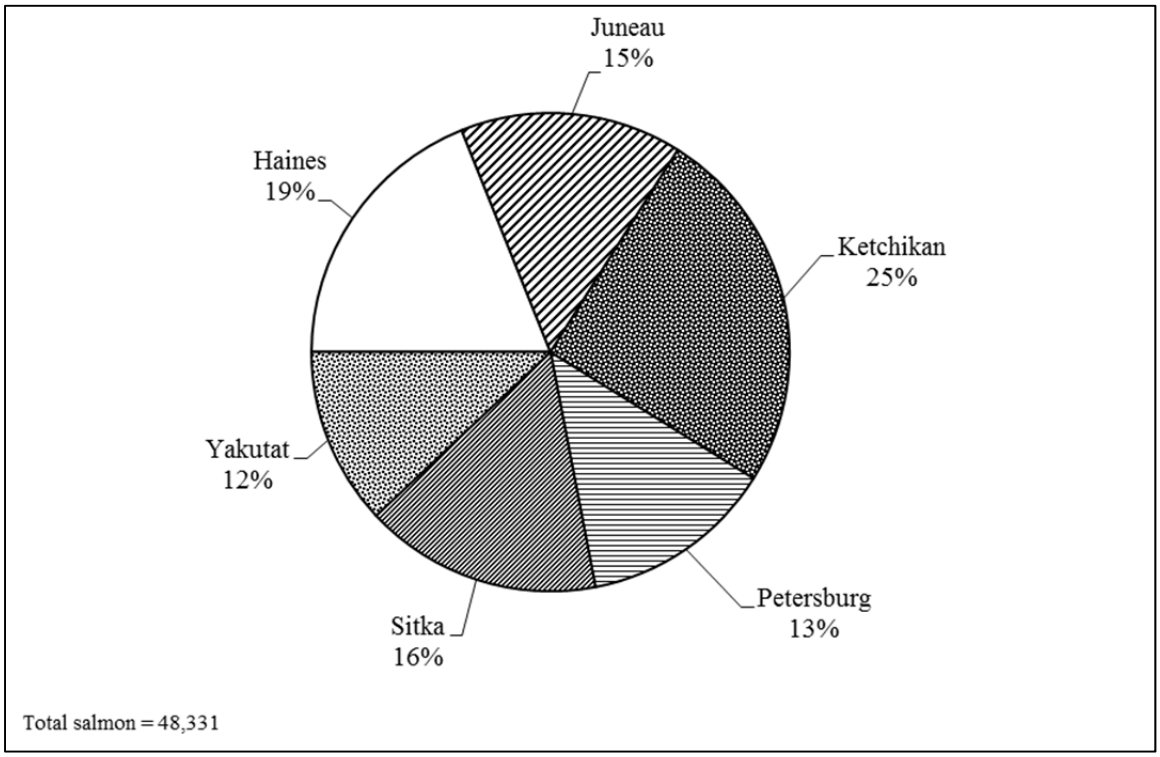

Figure 13-3.–Total salmon harvested in subsistence and personal use fisheries by management area, Southeast region, 2015.

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Each year, thousands of Alaska residents who participate in subsistence and personal use fisheries take the time to provide harvest information to ADF&G. We acknowledge their support with profound gratitude, for without it, a report like this would be impossible to produce.

We also offer thanks to the numerous ADF&G staff in the divisions of Commercial Fisheries, Sport Fish, and Subsistence who conduct the programs that collect, analyze, and report the subsistence and personal use fisheries harvest data every year. They, too, made this report possible.

Many ADF&G personnel generously made time to allow Division of Subsistence staff to interview them about subsistence databases and harvest assessment programs. We have relied upon their numerous insights about these programs to develop the Alaska Subsistence Fisheries Database, as well as to evaluate the data that appear in this report. We sincerely appreciate their help.

This annual report for 2015 is the result of the work of a number of Division of Subsistence staff. Former division employees Dave Caylor and Jeannie Heltzel, and current employees Brian Davis and David Koster helped design and update the Alaska Subsistence Fisheries Database. Data for 2015 were compiled by Terri Lemons. Division personnel who authored report chapters were James A. Fall, Anna Godduhn, Gabriela Halas, Lisa Hutchinson-Scarbrough, Bronwyn Jones, Elizabeth Mikow, Lauren A. Sill, Alida Trainor, and Amy Wiita. We also acknowledge the contributions of Lisa Olson and Adam Knight, who reviewed and edited the report.

As noted in the report itself, this is the 17th in a series of statewide summaries of subsistence and personal use fisheries harvest data. We encourage those who use this report to offer ideas and suggestions to improve future volumes in this series.

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