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Alaska Subsistence and Personal Use Salmon Fisheries 2016 Annual Report

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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 Division of Subsistence reports. All others, including deviations from definitions listed below, are noted in the text at first mention, in the titles or footnotes of tables, and in figures 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. states	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 and policy questions.

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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 2016 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 eighteenth 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 five 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 three 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 2016 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 2019, 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 a few 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.

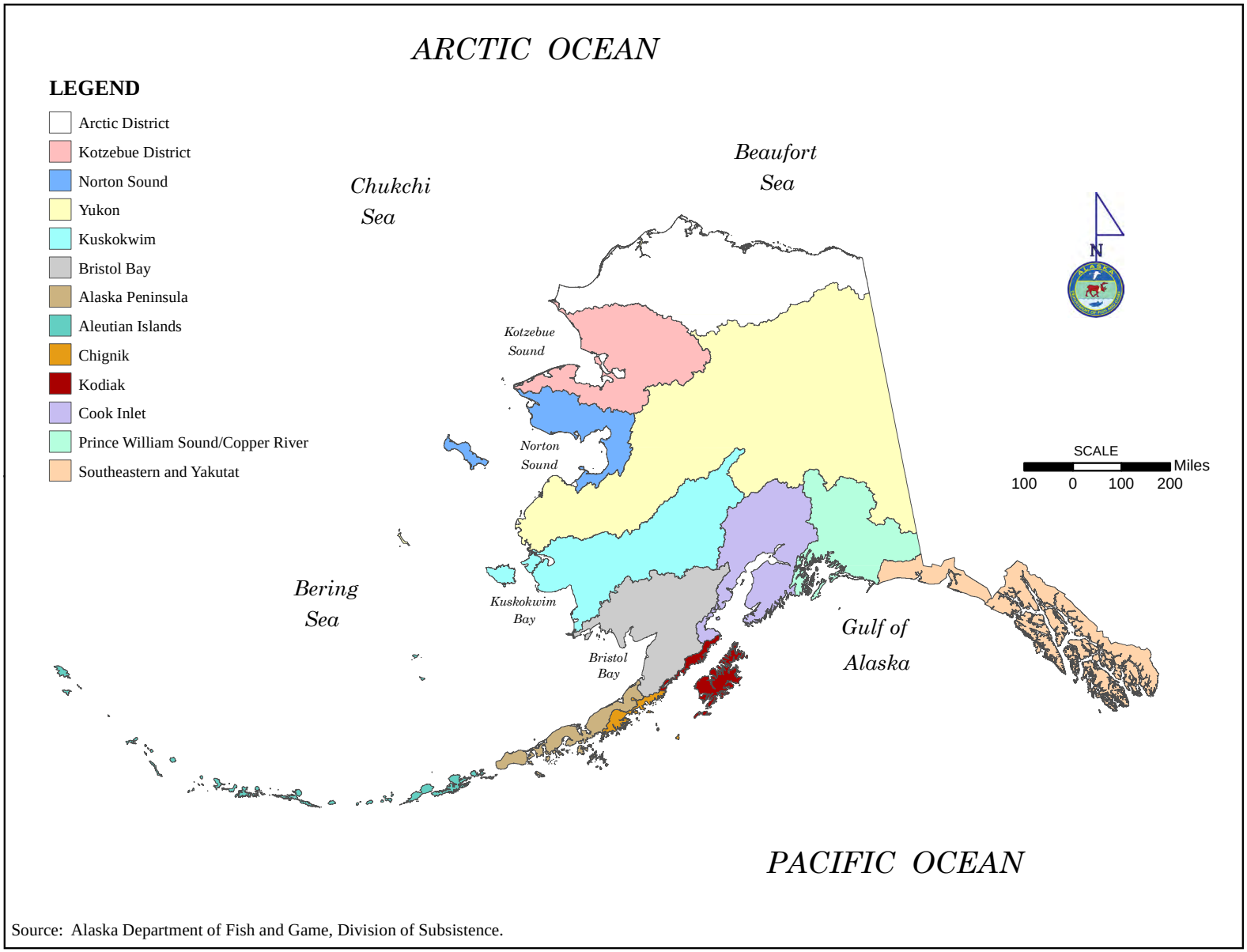
Significant modifications to data analysis procedures were implemented for two fisheries beginning with the 2015 report. First, as discussed in Chapter 3, there has been no annual subsistence salmon harvest monitoring program for the Kotzebue District since 2004. Few harvest estimates were developed 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 the 2015 and subsequent reports, based on the available data, interpolated harvest estimates are developed for a set of core communities to estimate district harvests for years without post-season harvest assessment programs (primarily 2005–2011, 2015, and 2016. 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 Tyonek Subdistrict of the Cook Inlet Area have not been expanded to produce a harvest estimate. Beginning with the 2015 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.

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/.

It is important to note that the preparation of this annual report and the supporting database were two 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 (2016). Both date and numeric ranges are inclusive. The following list illustrates named-ranges used in this report and their meanings.

5-year average:	2011–2015
10-year average:	2006–2015
15-year average:	2001–2015
Historical average:	yyyy–2015, beginning of range varies depending on available data.



Source: Alaska Department of Fish and Game, Division of Subsistence.

Figure 1-1.–Alaska subsistence fishery areas.

CHAPTER 2: OVERVIEW OF SUBSISTENCE FISHERIES IN ALASKA

Subsistence Harvests in Rural Alaska

Of the estimated 34.0 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 2018:2, 3) (Figure 2-1). On average, the subsistence fisheries harvest provides about 155 lb of food per person annually in rural Alaska (Fall 2018:2). 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 98.6% of the wild resource harvest, personal use fishing and general hunting by Alaskans take 0.2%, and sport fisheries and hunts take about 0.3% of the fish and game harvest.

Subsistence Salmon Harvests in 2016

The estimated total subsistence harvest of salmon in Alaska in 2016, based on annual harvest assessment programs, was 897,269 fish (Table 2-1).[1] The estimated statewide harvest by species was as follows: 332,421 sockeye salmon *O. nerka* (37%), 318,241 chum salmon *O. keta* (36%), 87,439 coho salmon *O. kisutch* (10%), 84,760 Chinook salmon *O. tshawytscha* (9%), and 74,408 pink salmon *O. gorbuscha* (8%) (Figure 2-2).

In 2016, fisheries in nine 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 (212,682 salmon; 24% of the statewide total); the Kuskokwim Management Area (180,836 salmon; 20%); the Bristol Bay Management Area (121,144 salmon; 13%); the Norton Sound-Port Clarence Area (102,213 salmon; 11%); the Glennallen Subdistrict of the Prince William Sound Management Area (87,960 salmon; 10%); the Kotzebue District[2] (73,154; 8%); Southeast Region[3] (including the Stikine River federal fishery) (46,719 salmon; 5%); the Kodiak Management Area (including federal permits) (24,179 salmon; 3%); and the Alaska Peninsula Area (14,139 salmon; 2%).

The largest estimated subsistence harvests of Chinook salmon in 2016 occurred in the Kuskokwim Management Area (36,268 salmon; 43%), followed by the Yukon Management Area (21,684 salmon; 26%), Bristol Bay Management Area (18,712 salmon; 22%), the Norton Sound-Port Clarence Area (2,689 salmon; 3%); and the Glennallen Subdistrict (2,557 salmon; 3%) (Figure 2-4). For sockeye salmon, the largest estimated subsistence harvests in 2016 were in the Bristol Bay Area (85,989 salmon; 26%), followed by the Glennallen Subdistrict (85,336 salmon; 26%), the Kuskokwim Management Area (54,627 salmon; 16%), the Southeast Region (including the Stikine River federal fishery) (39,488 salmon; 12%), the Kodiak Management Area (including federal permits) (20,902 salmon; 6%), the Norton Sound-Port Clarence Area (13,563 salmon; 4%), and the Alaska Peninsula Area (10,287 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 2016, as in past recent years, four areas dominated the subsistence chum salmon estimated harvest: the Yukon Management Area (173,191 salmon; 54% of the statewide harvest), Kotzebue District (64,678 salmon; 20%), the Kuskokwim Management Area (46,026 salmon; 15%), and the Norton Sound-Port Clarence Area (22,447 salmon; 7%) (Figure 2-6). Of the statewide estimated subsistence harvest of coho salmon in 2016, the greatest share was taken in the Kuskokwim Management Area (39,388 salmon; 45%), followed by the Norton Sound-Port Clarence Area (17,141; 20%), the Yukon Area (9,088 salmon; 10%), Bristol Bay Management Area (6,255 salmon; 7%), the Kotzebue District (4,259 salmon; 5%), the Southeast Region (including the Stikine River federal fishery) (3,396 salmon; 4%), and the Kodiak Management Area (including federal permits) (2,267 salmon; 3%) (Figure 2-7). Finally, the largest portion by far of the statewide estimated pink salmon subsistence harvest in 2016 occurred in the Norton Sound-Port Clarence Area (46,373 salmon; 62%), followed by the Yukon Area (8,719 salmon; 12%), the Bristol Bay Area (4,945 salmon; 7%), the Kuskokwim Area (4,527 salmon; 6%), the Kotzebue District (2,821 salmon; 4%), the Arctic District (2,594 salmon; 3%), and Southeast Region (including the Stikine River federal fishery) (2,378 salmon; 3%) (Figure 2-8).

Table 2-2 reports historical estimated subsistence salmon harvests for 1994 through 2016 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 23-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, all estimates since 2009 have been below the 2008 total of 958,741 salmon. The 2016 estimate of 897,269 salmon was the ninth-lowest since 1994, with the 860,809 salmon harvested in 2015 being the sixth-lowest estimate since 1994. The 2016 estimate was higher than the harvest estimate for 2015, and higher than the recent 5-year average (894,504 salmon), and the recent 10-year average (881,488 salmon), but lower than the historical average since 1994 (936,467 salmon). It should also be noted that the estimate of 84,760 Chinook salmon harvested in Alaska subsistence fisheries in 2016 was the highest estimate since 2011 and higher than the recent five-year harvest of 78,199 Chinook salmon. However, the 2016 Chinook subsistence harvest was lower than any year between 1994 and 2011 and was just 60% of the annual average since 1994 of 140,285 Chinook salmon.

Personal Use Salmon Harvests in 2016

In 2016, personal use fisheries produced an estimated harvest of 534,123 salmon (Table 2-1). The Kenai River dip net fishery accounted for 51% of the statewide personal use salmon harvest (271,523 fish), followed by the Chitina Subdistrict dip net fishery (29%; 155,863 salmon), the Kasilof River dip net fishery (12%; 61,616 salmon), the Kasilof River setnet fishery (5%; 26,731 salmon), the Southeast Region (Juneau and Ketchikan non-subsistence areas only) (2%; 10,529 salmon), and the Kachemak Bay setnet fishery (<1%; 2,560 salmon) (Figure 2-9). Sockeye salmon composed 96% of the Alaska personal use salmon harvest in 2016 (Figure 2-10).

The personal use harvest of 534,123 salmon in 2016 was the lowest total since 2008, and below the recent 5-year average of 753,535 salmon. However, the 2016 total was higher than any year between 1994 and 2008 (Table 2-3). The average annual personal use harvest since 1996 of 505,602 salmon is 95% of the 2016 total. Increased harvests in the Upper Cook Inlet personal use dip net fisheries accounted for most of the growth of personal use harvests from 1994 to 2015 (see Chapter 11).

Statewide Subsistence and Personal Use Salmon Harvests, 1994–2016

Table 2-4 reports historical estimated subsistence and personal use salmon harvests for 1994 through 2016 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 23-year period reflected in Table 2-4 shows generally stable to slightly increasing statewide harvest totals: the recent (2011–2015) 5-year average harvest was 1,648,038 salmon compared to a 22-year annual

average of 1,411,438 salmon. The total harvest estimate for 2016 of 1,431,392 salmon is the eighth-highest within the 23-year period, although down from all years since 2009. As noted above, however, harvests in subsistence fisheries have generally declined since 1994 while personal use harvests have increased. In 2016, sockeye salmon made up 59% of the combined subsistence and personal use salmon harvests, followed by chum (22%), coho (7%), coho (7%), Chinook (6%), and pink (5%) (Figure 2-11).

Table 2-5 reports subsistence and personal use harvests in 2016 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, 2016.

Fishery	Households or permits		Estimated salmon harvest					
	Total[a]	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Subsistence								
Adak District	0	0	0	0	0	0	0	0
Alaska Peninsula Management Area	166	126	255	10,287	2,122	772	703	14,139
Arctic District[b]	1,900	432	126	519	846	4,247	2,594	8,332
Batzulnetas Fishery	0	0	0	0	0	0	0	0
Bristol Bay Management Area	1,172	1,057	18,712	85,989	6,255	5,243	4,945	121,144
Chignik Management Area	118	93	97	8,150	552	118	251	9,168
Chitina Subdistrict: Federal	128	95	20	1,979	45	0	0	2,044
Copper River Flats	198	192	75	1,119	0	0	12	1,206
Glennallen Subdistrict	2,089	1,688	2,557	85,336	66	0	0	87,960
Kenai and Kasilof Rivers: Federal	227	219	2	2,500	12	0	0	2,514
Kodiak Management Area[a]	1,512	1,512	135	20,902	2,267	160	715	24,179
Kotzebue District[b]	1,583	854	613	783	4,259	64,678	2,821	73,154
Kuskokwim Management Area	4,163	1,820	36,268	54,627	39,388	46,026	4,527	180,836
Norton Sound - Port Clarence Area[b]	2,136	2,094	2,689	13,563	17,141	22,447	46,373	102,213
Port Graham & Koyuktolik Subdistricts[a]	32	32	17	620	697	239	22	1,595
Prince William Sound (General)	2	2	0	1	0	0	0	1
PWS Eastern District (Tatitlek)	5	5	0	0	0	0	0	0
PWS Southwestern District (Chenega Ba	7	6	0	32	1	15	0	48
PWS/Chugach Subdistrict: Federal	110	93	0	234	555	0	0	789
Seldovia Fishery	4	4	7	53	0	1	2	63
Southeast Region	2,591	2,080	374	37,322	3,323	1,000	2,313	44,333
Stikine River Federal Fishery	136	136	59	2,166	73	23	65	2,386
Tyonek Fishery	74	64	1,030	188	225	8	12	1,462
Unalaska District	255	177	40	5,538	320	35	298	6,231
Upper Yentna Fishery	26	25	0	514	204	37	36	790
Yukon Management Area[c]	3,589	1,965	21,684	0	9,088	173,191	8,719	212,682
Subtotal, Subsistence	**22,223**	**14,771**	**84,760**	**332,421**	**87,439**	**318,241**	**74,408**	**897,269**

-continued-

Table 2-1.–Page 2 of 2.

Fishery	Households or permits: Total[a]	Households or permits: Surveyed or returned	Estimated salmon harvest: Chinook	Sockeye	Coho	Chum	Pink	Total
Personal use								
Chitina Subdistrict: State[d]	11,353	9,301	691	153,916	1,256	0	0	155,863
Kachemak Bay setnet[e]	170	169	18	166	2,033	335	8	2,560
Kasilof River setnet[e]	NA	NA	141	26,539	23	23	5	26,731
Kasilof River dip net[e]	NA	NA	26	58,273	1,255	329	1,733	61,616
Kenai River dip net[e]	NA	NA	638	259,057	3,277	717	7,834	271,523
Fish Creek dip net[e]	NA	NA	--	--	--	--	--	--
Unknown Upper Cook Inlet[e]	NA	NA	15	4,837	34	81	233	5,200
Beluga River dip net	11	10	0	52	45	2	2	101
Southeast Region	448	448	75	8,239	202	637	1,376	10,529
Subtotal, Personal use[e]	**43,198**	**33,782**	**1,604**	**511,079**	**8,125**	**2,124**	**11,191**	**534,123**
Total	**65,421**	**48,553**	**86,364**	**843,500**	**95,564**	**320,365**	**85,599**	**1,431,392**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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 set net, 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 31,216 permits issued and 23,854 permits returned for these fisheries.

NA = Data not available.

Table 2-2.–Historical Alaska subsistence salmon harvests, 1994–2016.

Year	Households or permits		Estimated salmon harvest					
	Total	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1994	15,493	10,553	183,936	338,946	135,896	417,199	94,469	1,170,446
1995	15,596	10,328	180,805	291,539	120,048	499,992	54,908	1,147,292
1996	16,512	11,789	158,369	320,821	121,381	498,525	80,928	1,180,026
1997	17,668	12,863	176,703	376,397	98,883	347,808	41,543	1,041,335
1998	17,772	12,513	170,271	328,857	93,055	302,037	74,216	968,436
1999	17,290	12,763	155,088	358,866	89,627	338,351	32,402	974,334
2000	16,678	12,765	130,822	296,875	99,338	247,337	51,714	826,087
2001	18,693	13,061	161,632	340,411	98,517	240,581	42,435	883,576
2002	17,266	13,026	142,459	299,182	92,192	229,179	85,431	848,443
2003	18,131	13,211	164,555	324,539	106,488	238,582	66,794	900,958
2004	18,374	13,549	173,746	332,543	100,860	239,811	91,597	938,557
2005	16,256	11,013	153,431	323,218	97,993	257,200	76,071	907,912
2006	16,988	11,400	139,815	314,435	93,478	291,510	73,234	912,473
2007	17,068	10,374	154,974	319,885	78,704	273,802	33,513	860,877
2008	17,226	11,248	174,115	315,040	113,242	270,502	85,842	958,741
2009	16,989	11,607	141,302	296,104	86,363	213,835	38,038	775,642
2010	16,020	11,381	133,252	326,363	80,217	235,763	59,031	834,627
2011	17,181	12,155	128,657	341,388	77,180	257,032	35,646	839,903
2012	18,598	11,970	74,381	344,071	80,275	367,692	69,051	935,470
2013	18,676	13,190	83,729	347,834	81,295	360,920	29,963	903,741
2014	21,577	14,236	42,661	348,651	115,085	357,579	68,621	932,596
2015	21,501	13,847	61,567	351,339	95,756	315,973	48,512	860,809
2016	22,223	14,771	84,760	332,421	87,439	318,241	74,408	897,269
5-year average (2011–2015)	19,507	13,080	78,199	346,656	89,918	331,839	50,359	894,504
10-year average (2006–2015)	18,182	12,141	113,445	330,511	90,160	294,461	54,145	881,488
Historical average (1994–2015)	17,616	12,220	140,285	328,968	97,994	309,146	60,634	936,467

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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

Table 2-3.–Historical Alaska personal use salmon harvests, 1994–2016.

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
2016	43,198	33,782	1,604	511,079	8,125	2,124	11,191	534,123
5-year average (2011–2015)	46,354	36,587	1,426	729,089	10,736	1,668	10,615	753,535
10-year average (2006–2015)	40,370	32,894	2,329	612,543	9,376	1,336	9,923	635,508
Historical average (1996–2015)	33,413	27,994	3,634	485,647	8,198	1,216	6,906	505,602

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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, 1994–2016.

Year	Households or permits		Estimated salmon harvest					
	Total	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1994	22,839	16,776	189,460	481,890	151,707	418,818	97,300	1,339,175
1995	22,593	16,002	187,834	431,401	138,503	501,664	56,487	1,315,888
1996	38,583	32,496	162,730	562,114	132,944	498,900	84,923	1,441,611
1997	41,949	35,802	183,022	674,548	101,637	347,909	42,644	1,349,759
1998	43,536	35,668	177,701	642,987	99,357	302,262	76,316	1,298,623
1999	45,197	37,350	162,717	719,752	95,112	339,413	35,499	1,352,493
2000	41,685	34,771	135,476	571,297	108,914	248,892	55,496	1,120,074
2001	45,710	36,453	166,263	706,285	105,507	242,327	46,472	1,266,854
2002	42,187	33,586	145,908	657,790	99,157	230,691	95,475	1,229,021
2003	44,232	34,918	168,321	719,467	112,493	240,028	70,181	1,310,489
2004	49,047	38,754	177,521	803,348	109,080	241,540	95,168	1,426,657
2005	47,073	37,690	156,798	831,637	104,343	258,418	79,847	1,431,042
2006	44,533	35,172	144,078	668,565	101,078	292,722	86,975	1,293,419
2007	48,923	38,296	159,747	816,202	84,843	274,599	37,780	1,373,171
2008	49,808	39,183	177,761	725,338	121,233	271,429	98,893	1,394,654
2009	55,432	44,407	142,956	854,456	93,235	214,708	45,743	1,351,098
2010	57,525	44,961	135,078	987,255	91,692	236,975	66,424	1,517,424
2011	61,389	47,420	131,318	1,114,928	86,894	258,493	42,017	1,633,650
2012	63,357	47,505	75,211	1,120,675	89,247	368,524	75,158	1,728,815
2013	64,963	49,090	84,617	997,431	89,784	362,276	34,936	1,569,044
2014	69,858	52,102	43,598	1,033,113	128,282	359,914	95,915	1,660,821
2015	69,737	52,215	51,042	1,112,581	109,066	318,329	56,840	1,647,862
2016	65,421	48,553	86,364	843,500	95,564	320,365	85,599	1,431,392
5-year average (2011–2015)	65,861	49,666	77,157	1,075,745	100,655	333,507	60,973	1,648,038
10-year average (2006–2015)	58,553	45,035	114,541	943,054	99,535	295,797	64,068	1,516,996
Historical average (1994–2015)	48,643	38,210	143,598	783,321	107,005	310,401	67,113	1,411,438

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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

Table 2-5.–Alaska subsistence and personal use salmon harvests by species and place of residence, 2016.

Community	Households or permits		Estimated salmon harvest					
	Total	Included[a]	Chinook	Sockeye	Coho	Chum	Pink	Total
Adak	1	1	0	0	0	0	0	0
Akhiok	8	7	0	485	72	0	65	622
Akiachak	167	89	3,438	2,735	2,007	2,176	199	10,556
Akiak	88	40	1,274	3,772	2,403	5,803	649	13,901
Alakanuk	145	69	465	0	183	7,270	713	8,631
Alatna	7	5	1	0	0	652	0	653
Aleknagik	28	25	1,019	1,144	101	81	2	2,346
Alexander	1	1	0	16	0	0	0	16
Allakaket	60	22	45	0	33	2,901	0	2,979
Ambler	78	57	4	150	189	3,201	201	3,746
Anaktuvuk Pass	5	4	0	106	0	0	1	108
Anchor Point	253	211	9	2,593	9	4	63	2,678
Anchorage	19,133	14,520	1,881	233,872	2,785	879	5,381	244,798
Anderson	11	11	0	72	0	0	0	72
Angoon	91	73	0	1,203	167	19	7	1,396
Aniak	178	159	1,293	8,380	7,530	2,422	478	20,103
Anvik	34	27	241	0	184	1,644	0	2,069
Arctic Village	2	2	0	17	0	0	4	21
Atmautluak	67	39	763	1,562	81	1,609	83	4,098
Atqasuk	2	1	0	13	0	0	0	14
Auke Bay	4	4	1	41	2	22	0	66
Barrow	1,684	320	68	1,659	514	3,640	1,271	7,152
Beaver	210	83	165	0	0	251	0	416
Bethel	1,932	598	9,462	16,844	16,802	13,494	1,567	58,169
Bettles	31	17	0	16	0	13	0	29
Big Lake	219	167	25	3,442	25	13	39	3,543
Birch Creek	29	21	0	0	0	0	0	0
Bird Creek	3	2	0	21	0	0	0	21
Brevig Mission	41	41	18	1,304	481	2,164	2,582	6,549
Buckland	99	88	299	231	917	3,048	494	4,989
Cantwell	14	14	2	120	4	0	0	126
Central	8	8	53	25	0	18	0	96
Chalkyitsik	461	216	50	0	30	550	0	630
Chenega Bay	6	6	0	46	1	15	0	62
Chevak	2	1	0	9	0	0	0	10
Chickaloon	24	22	3	383	0	0	0	386
Chicken	1	0	0	0	0	0	0	0
Chignik Bay	12	9	3	605	15	0	0	623
Chignik Lagoon	26	22	41	2,559	45	2	112	2,760
Chignik Lake	20	18	2	1,694	0	0	4	1,701
Chiniak	22	21	1	212	36	6	2	258
Chistochina	5	4	1	328	1	0	0	330
Chitina	35	29	64	1,426	4	0	1	1,494
Chuathbaluk	31	28	203	210	149	347	92	1,001
Chugiak	825	699	75	10,115	171	26	138	10,523
Circle	19	19	207	0	38	1,288	0	1,533

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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
Clam Gulch	49	42	2	448	1	0	7	459
Clarks Point	13	12	203	602	549	90	34	1,478
Clear	17	16	1	240	0	0	7	249
Coffman Cove	6	3	0	0	0	0	0	0
Cold Bay	21	17	0	1,114	3	11	6	1,134
Cooper Landing	121	111	1	1,485	1	1	2	1,489
Copper Center	134	99	110	9,644	0	0	1	9,756
Copperville	5	5	22	371	0	0	0	393
Cordova	287	264	73	1,504	555	0	13	2,145
Craig	102	65	0	735	114	8	36	892
Crooked Creek	36	26	384	264	298	831	2	1,779
Delta Junction	446	399	62	9,779	2	4	9	9,857
Denali National Park	56	53	3	798	0	0	12	813
Dillingham	380	340	9,733	16,326	3,034	3,147	3,703	35,943
Dot Lake	1	0	0	0	0	0	0	0
Douglas	48	48	3	446	58	0	15	522
Dutch Harbor	114	79	1	2,274	117	6	76	2,475
Eagle	33	33	864	10	0	15,765	0	16,639
Eagle River	2,424	2,047	199	31,149	374	26	561	32,309
Eek	97	43	1,460	897	410	681	58	3,507
Egegik	5	4	15	181	29	4	0	229
Eielson AFB	97	84	8	1,660	76	0	10	1,755
Ekwok	18	14	675	378	64	262	39	1,418
Elfin Cove	2	2	0	9	2	0	0	11
Elim	51	51	160	60	1,164	824	5,985	8,193
Emmonak	192	106	939	0	717	11,477	228	13,361
Ester	91	80	14	1,617	20	0	7	1,658
Fairbanks	4,157	3,488	1,909	60,558	1,970	4,053	211	68,700
False Pass	2	2	2	45	180	0	0	227
Fort Greely	39	34	1	357	1	0	0	359
Fort Richardson	1	1	0	0	0	0	0	0
Fort Wainwright	123	92	4	1,243	29	0	4	1,280
Fort Yukon	77	34	1,226	10	1	7,749	0	8,986
Fritz Creek	6	6	0	61	0	0	2	63
Gakona	49	39	62	1,951	0	0	0	2,012
Galena	146	52	994	26	201	5,008	11	6,240
Gambell	2	2	0	0	0	0	0	0
Girdwood	262	217	15	3,200	10	7	68	3,300
Glennallen	120	97	112	4,522	10	0	0	4,643
Golovin	25	24	20	19	253	358	2,306	2,956
Goodnews Bay	78	37	654	975	378	219	41	2,267
Grayling	54	22	370	0	35	1,377	33	1,815
Gulkana	4	0	0	0	0	0	0	0
Gustavus	24	22	0	209	7	4	3	224
Haines	468	437	13	9,304	297	533	945	11,091
Healy	77	70	4	1,054	1	0	25	1,085
Hollis	22	17	0	162	34	1	129	326

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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
Holy Cross	63	37	557	9	134	1,574	2	2,277
Homer	813	683	130	9,785	183	68	273	10,439
Hoonah	111	85	0	999	21	7	29	1,055
Hooper Bay	219	98	284	8	121	6,429	4,008	10,850
Hope	36	36	0	409	0	0	1	410
Houston	44	34	12	957	1	2	9	982
Hughes	36	27	17	0	0	1,817	0	1,834
Huslia	90	35	77	42	93	3,901	0	4,113
Hydaburg	49	27	0	673	83	13	0	769
Igiugig	8	6	7	522	0	0	0	529
Iliamna	19	17	11	5,723	0	0	0	5,734
Indian	8	7	0	112	0	0	0	112
Joint Base Elmendorf-Richardson	386	282	15	3,395	117	4	89	3,621
Juneau	687	588	60	8,439	286	61	502	9,348
Kake	130	111	6	2,242	33	57	104	2,443
Kaktovik	5	2	1	33	0	0	1	35
Kaltag	52	21	1,358	0	53	1,147	73	2,631
Karluk	6	6	0	455	2	0	0	457
Kasaan	13	10	0	186	25	0	10	221
Kasigluk	114	59	951	1,543	394	1,485	24	4,397
Kasilof	418	349	32	4,921	30	26	93	5,103
Kenai	1,553	1,247	151	16,345	122	39	496	17,153
Kennicott	7	5	0	0	0	0	0	0
Kenny Lake	51	44	86	1,877	11	0	0	1,974
Ketchikan	284	197	42	2,566	160	615	907	4,290
Kiana	101	71	4	32	88	2,053	167	2,344
King Cove	30	22	4	3,367	559	123	92	4,144
King Salmon	76	71	224	3,963	192	38	19	4,436
Klawock	94	59	0	2,544	495	56	172	3,268
Klukwan	12	9	0	388	13	17	13	432
Kobuk	37	31	3	40	6	2,156	54	2,259
Kodiak (city)	1,178	1,164	115	16,545	1,443	92	483	18,679
Kokhanok	23	21	4	7,287	3	2	7	7,303
Koliganek	20	18	1,082	787	321	303	17	2,510
Kongiganak[b]	90	0	0	0	0	0	0	0
Kotlik	116	54	1,172	4	278	10,352	513	12,319
Kotzebue	620	169	142	717	220	25,282	177	26,539
Koyuk	80	77	241	258	949	2,734	2,144	6,326
Koyukuk	44	20	612	0	1	416	0	1,029
Kwethluk	173	65	1,731	2,477	682	2,326	209	7,425
Kwigillingok	1	0	0	0	0	0	0	0
Lake Louise	1	1	0	43	0	0	0	43
Larsen Bay	19	19	4	949	15	4	0	972
Levelock	8	7	10	1,407	0	0	0	1,417
Lime Village	9	0	35	541	123	232	225	1,156
Lower Kalskag	84	44	578	284	228	624	0	1,714

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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
Manley Hot Springs	14	13	230	0	323	446	0	999
Manokotak	23	20	52	2,310	131	13	43	2,548
Marshall	98	53	512	0	409	6,286	5	7,212
McCarthy	35	29	0	242	0	0	0	242
McGrath	131	67	384	323	769	150	0	1,627
Mendeltna	1	1	0	2	0	0	0	2
Mentasta Lake	6	3	8	270	0	0	0	278
Metlakatla	4	3	0	0	0	0	0	0
Minto	22	19	35	0	0	44	0	79
Moose Creek	1	1	0	0	0	0	0	0
Moose Pass	25	22	0	180	1	0	10	190
Mountain Village	170	70	809	5	438	9,986	89	11,327
Nabesna	5	5	0	216	0	0	0	216
Naknek	86	74	385	9,882	368	134	214	10,983
Nanwalek	20	20	15	620	677	199	12	1,523
Napakiak	101	49	1,151	2,141	506	2,091	220	6,110
Napaskiak	107	58	1,535	2,086	726	1,901	95	6,343
Naukati Bay	1	1	0	0	0	0	0	0
Nelchina	4	4	3	65	0	0	0	68
Nelson Lagoon	2	1	0	300	100	0	0	400
Nenana	82	73	471	688	2,970	3,563	18	7,710
New Stuyahok	44	34	2,874	1,591	437	496	318	5,716
Newhalen	12	12	0	4,663	0	0	0	4,663
Nikiski	207	161	7	1,942	24	4	62	2,038
Nikolaevsk	8	6	0	92	4	0	1	97
Nikolai	39	38	367	50	614	205	7	1,244
Ninilchik	206	190	3	1,497	26	1	17	1,543
Noatak	128	95	14	46	980	5,337	79	6,456
Nome	1,252	1,242	75	10,250	2,515	3,553	11,698	28,091
Nondalton	10	9	0	2,338	0	0	0	2,338
Noorvik	140	97	25	135	722	15,339	457	16,678
North Pole	1,156	951	204	19,768	64	6	64	20,105
Northway	6	4	8	362	0	0	0	369
Nuiqsut	111	59	0	45	0	261	99	406
Nulato	76	29	1,957	0	0	3,682	0	5,639
Nunam Iqua (Sheldon Point)	40	25	190	0	58	2,241	352	2,841
Nunapitchuk	121	67	1,695	2,508	492	2,422	26	7,143
Old Harbor	17	17	2	531	253	42	48	876
Oscarville	15	15	208	329	134	240	8	919
Other communities[c]	50	50	307	0	0	205	0	512
Ouzinkie	24	24	4	1,033	334	8	54	1,433
Palmer	2,268	1,821	338	32,052	384	31	539	33,344
Pedro Bay	13	11	0	2,036	0	0	0	2,036
Pelican	5	5	0	56	4	0	1	61
Perryville	25	22	9	2,034	484	116	134	2,777
Peters Creek	1	1	2	54	0	0	0	56

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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
Petersburg	180	164	16	2,024	471	46	84	2,641
Pilot Point	5	4	13	625	118	18	9	781
Pilot Station	125	63	652	0	136	5,699	8	6,495
Pitkas Point	30	23	156	0	22	1,717	48	1,943
Platinum	18	18	99	381	180	78	20	758
Point Baker	2	2	0	0	0	0	4	4
Point Hope	180	106	143	57	1,124	1,723	1,171	4,217
Point Lay	63	40	32	358	142	258	1,151	1,940
Port Alexander	4	3	0	129	0	0	0	129
Port Alsworth	40	38	1	4,166	0	0	0	4,167
Port Graham	12	12	2	0	20	40	10	72
Port Heiden	29	29	131	696	360	11	17	1,215
Port Lions	28	28	10	682	100	0	65	857
Prudhoe Bay	1	0	0	9	0	0	0	10
Quinhagak	172	92	4,822	1,691	2,014	848	115	9,490
Rampart	4	4	50	0	2	129	0	181
Red Devil	8	5	69	238	166	129	0	602
Ruby	60	23	344	0	226	1,204	0	1,774
Russian Mission	77	30	321	0	6	2,033	0	2,360
Saint George	1	1	0	2	0	0	0	2
Saint Marys	136	66	1,032	9	128	8,467	104	9,741
Saint Michael	102	93	567	9	933	3,051	317	4,877
Salcha	73	61	7	975	1	0	1	984
Sand Point	51	33	103	3,514	820	564	493	5,493
Savoonga	3	3	0	0	0	1	21	22
Saxman	21	15	0	409	0	10	69	487
Scammon Bay	118	58	602	0	234	6,177	2,490	9,503
Selawik	177	125	0	58	6	1,678	5	1,748
Seldovia	17	14	12	240	1	1	5	258
Seward	183	153	8	1,501	8	6	36	1,559
Shageluk	25	17	23	0	0	454	9	486
Shaktoolik	68	67	251	111	1,854	558	3,534	6,308
Shishmaref	1	1	0	12	0	0	0	12
Shungnak	66	47	0	30	15	4,861	27	4,932
Sitka	533	466	62	9,094	318	94	421	9,989
Skagway	34	31	0	478	12	4	135	629
Skwentna	13	12	0	259	139	10	35	442
Slana	22	21	1	856	0	0	0	857
Sleetmute	34	25	169	458	524	268	24	1,443
Soldotna	1,850	1,578	280	17,983	116	69	450	18,898
South Naknek	18	17	23	1,112	58	31	35	1,259
Stebbins	142	133	649	32	1,893	3,658	1,874	8,106
Sterling	446	386	9	4,458	30	5	128	4,630
Stevens Village	12	9	178	0	50	5,000	0	5,228
Stony River	13	11	33	95	29	14	11	182
Sutton	135	116	2	1,839	31	1	13	1,886
Takotna	25	19	0	5	90	5	2	102

-continued-

Table 2-5.–Page 6 of 6.

Community	Households or permits		Estimated salmon harvest					
	Total	Included[a]	Chinook	Sockeye	Coho	Chum	Pink	Total
Talkeetna	107	91	12	1,449	72	17	164	1,714
Tanacross	1	1	0	29	0	0	0	29
Tanana	11	7	2,129	0	639	24,946	34	27,748
Tatitlek	4	4	7	13	0	0	0	20
Tazlina	57	44	137	3,057	10	0	0	3,204
Telida[b]	2	0	0	0	0	0	0	0
Teller	53	52	8	1,247	106	1,757	1,191	4,309
Tenakee Springs	1	1	0	0	0	0	0	0
Tetlin	1	0	0	0	0	0	0	0
Thorne Bay	13	8	0	101	17	0	1	119
Togiak	62	57	1,086	3,398	471	348	198	5,502
Tok	98	78	26	4,804	32	0	1	4,862
Toksook Bay	1	1	0	0	0	0	0	0
Tolsona	5	5	2	99	0	0	0	101
Tonsina	7	7	15	478	0	0	0	493
Trapper Creek	30	26	1	410	1	0	6	418
Tuluksak	97	45	709	1,249	482	2,698	158	5,296
Tuntutuliak	107	64	1,963	1,716	456	1,673	130	5,939
Twin Hills	8	8	54	382	50	29	0	515
Two Rivers	22	18	1	268	0	0	2	272
Tyonek	57	53	825	144	203	8	12	1,192
Ugashik	5	5	20	210	42	0	0	272
Unalakleet	271	258	688	427	6,623	3,058	10,784	21,580
Unalaska	128	85	38	3,236	204	29	222	3,729
Upper Kalskag	64	39	838	1,194	722	1,055	87	3,896
Valdez	332	272	121	5,028	34	0	1	5,183
Venetie	32	17	536	0	0	5,333	0	5,869
Wainwright	145	75	27	86	209	89	97	507
Ward Cove	3	3	0	0	0	0	0	0
Wasilla	4,720	3,779	629	69,198	766	204	866	71,664
White Mountain	33	33	15	25	358	640	3,789	4,827
Whittier	6	4	0	105	0	0	2	107
Willow	215	167	33	2,988	55	14	60	3,151
Wiseman	2	2	0	0	0	0	0	0
Wrangell	197	178	61	2,364	84	107	86	2,702
Yakutat	112	92	324	3,518	906	0	94	4,842
Other USA	61	34	4	690	3	2	22	721
Unknown community	1,360	617	49	12,280	2,235	375	329	15,268
Total	**65,421**	**48,553**	**86,364**	**843,500**	**95,564**	**320,365**	**85,599**	**1,431,392**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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

b. These communities were not contacted during the 2016 study period. Not enough data was available to estimate

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.

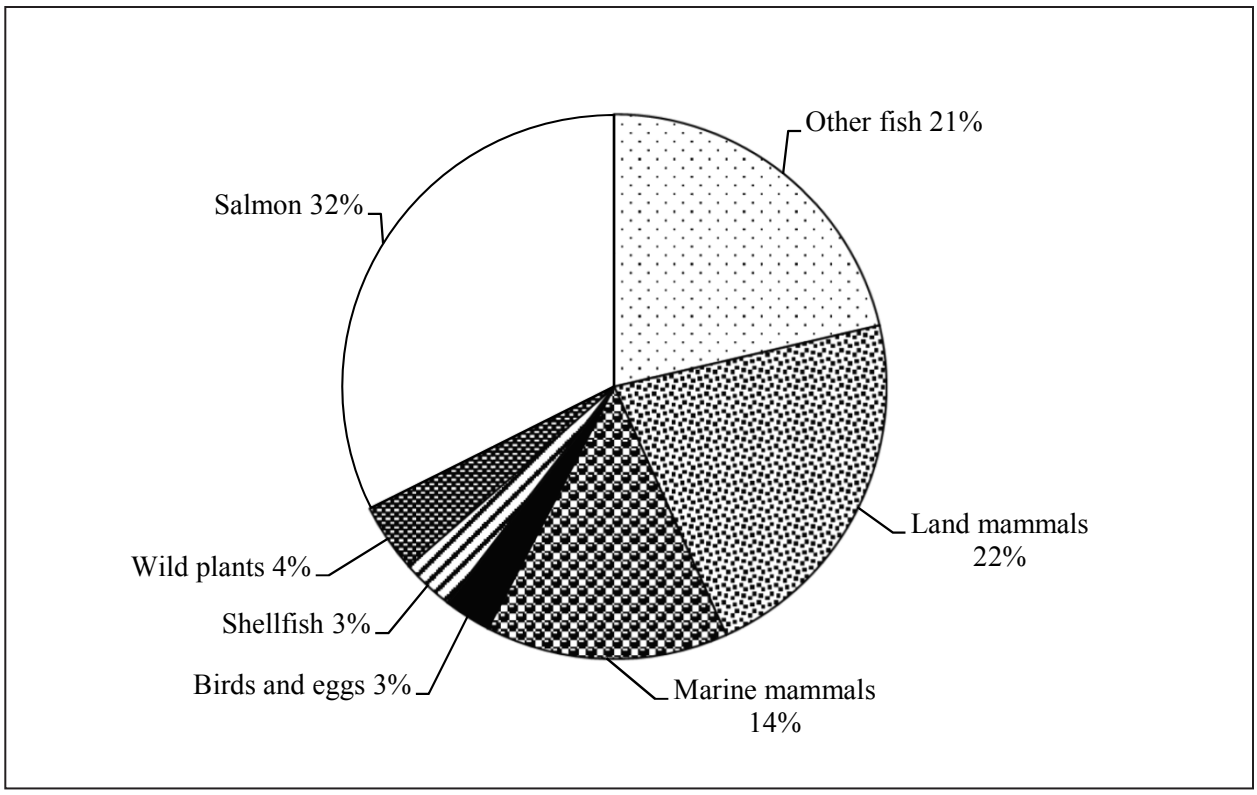


Figure 2-1.–Composition of subsistence harvest by rural Alaska residents, 2016.

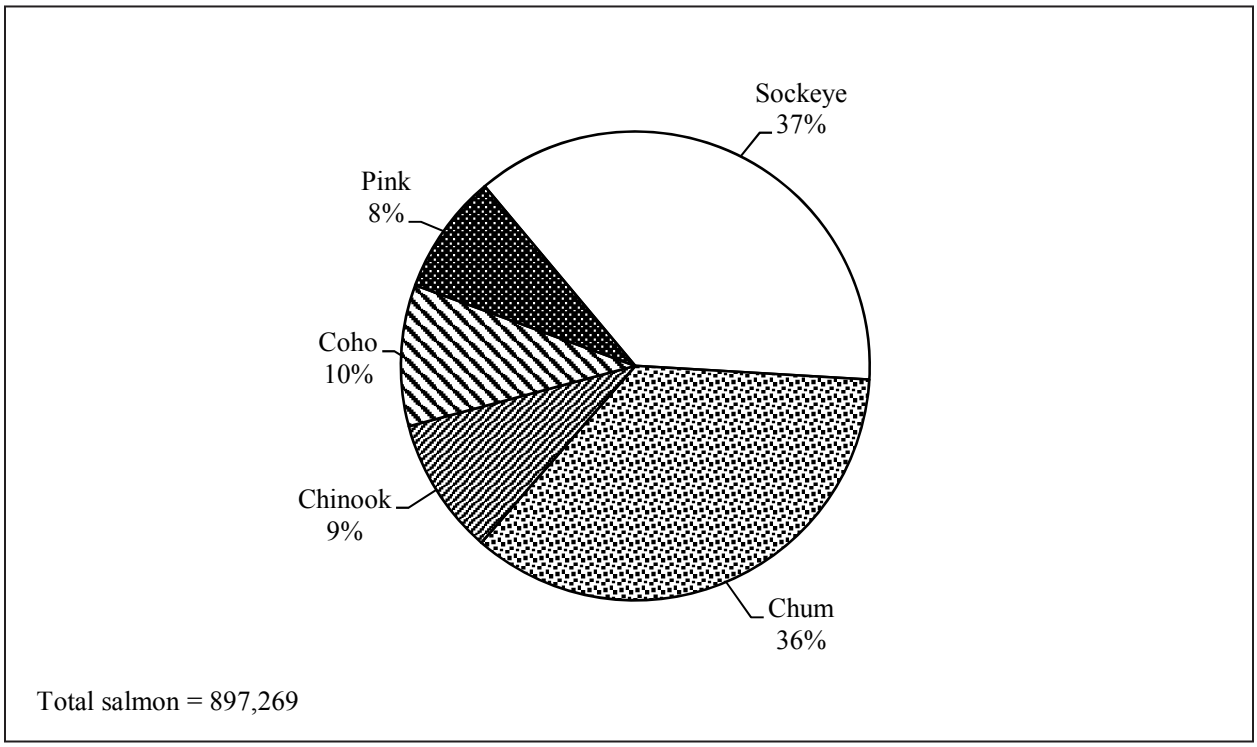
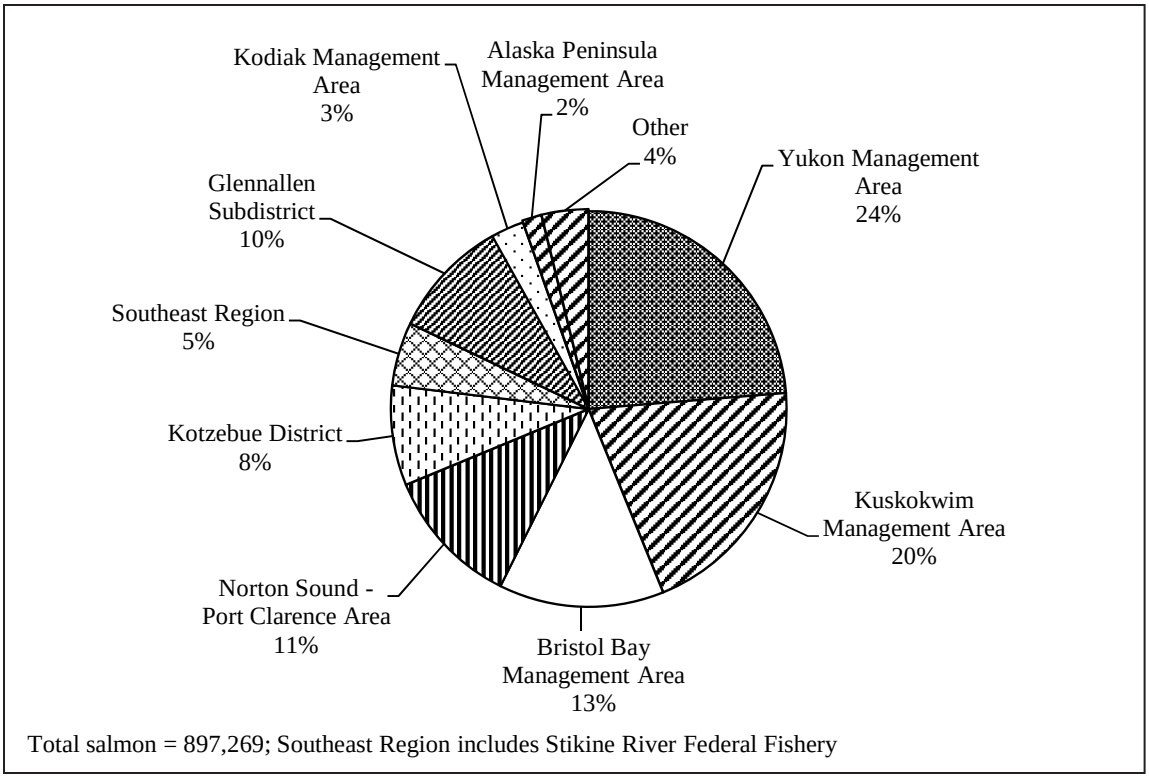
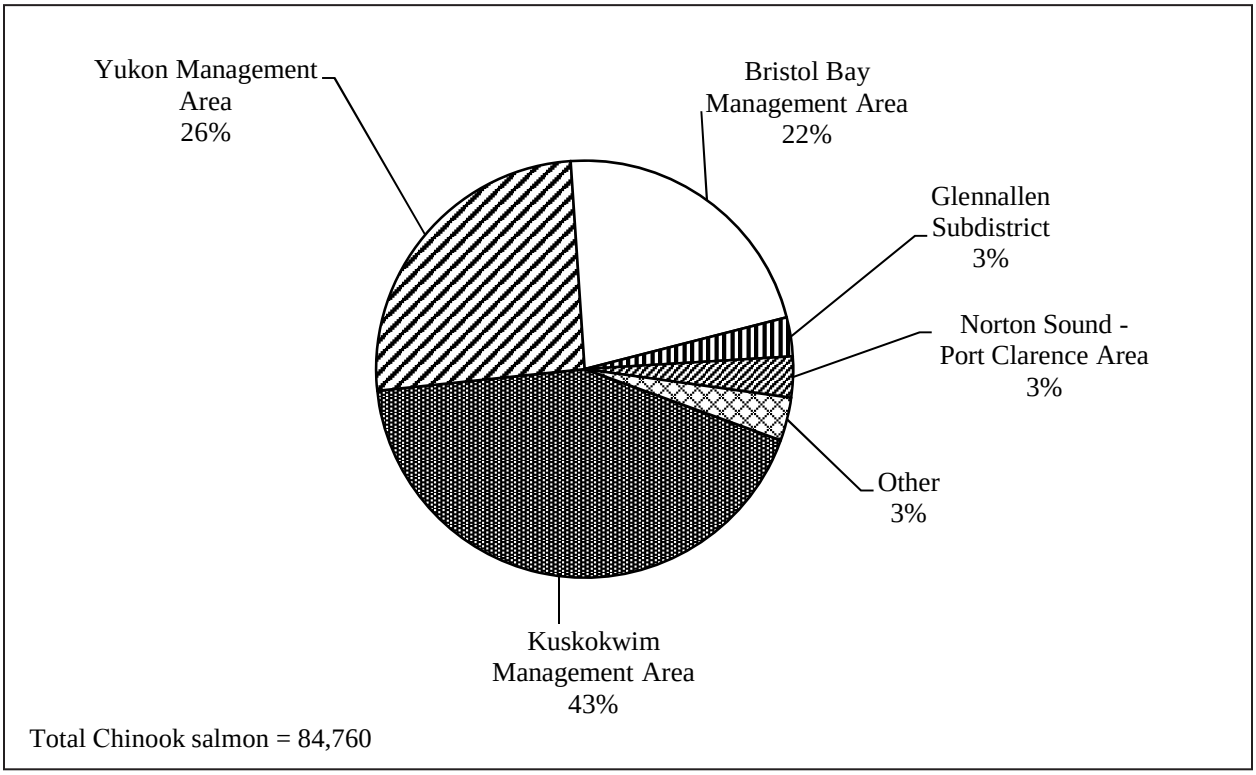


Figure 2-2.–Alaska subsistence salmon harvest by species, 2016.



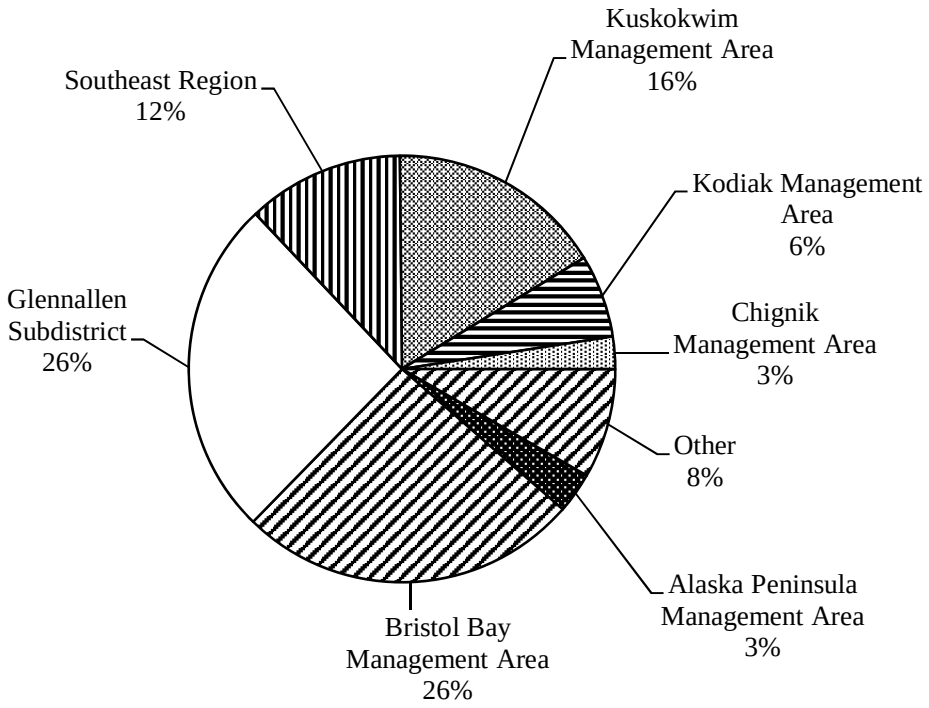
Total salmon = 897,269; Southeast Region includes Stikine River Federal Fishery

Figure 2-3.–Alaska subsistence salmon harvest by area, 2016.



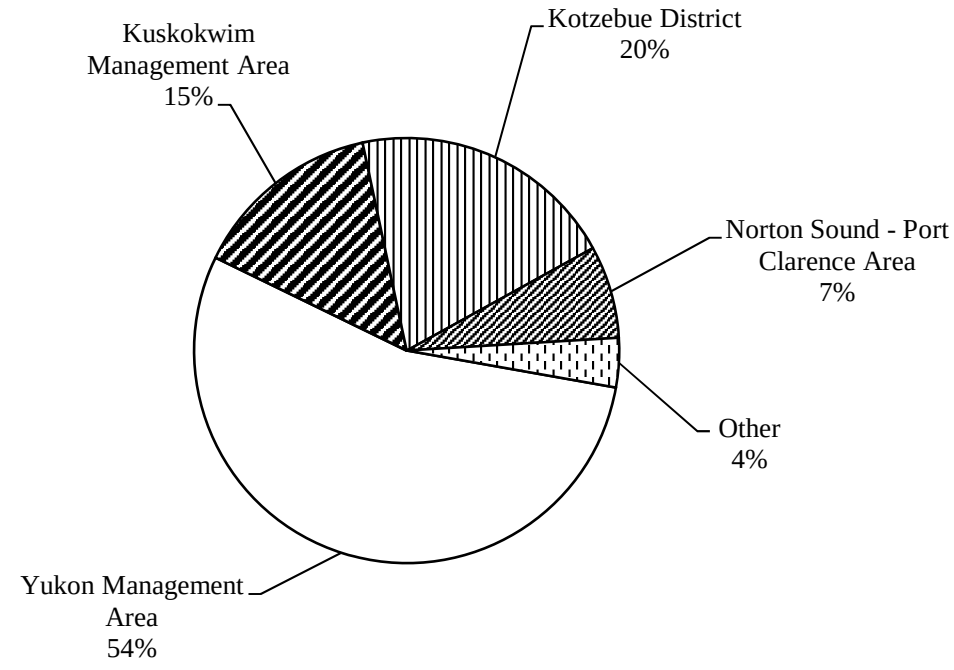
Total Chinook salmon = 84,760

Figure 2-4.–Subsistence chinook salmon harvest by area, 2016.



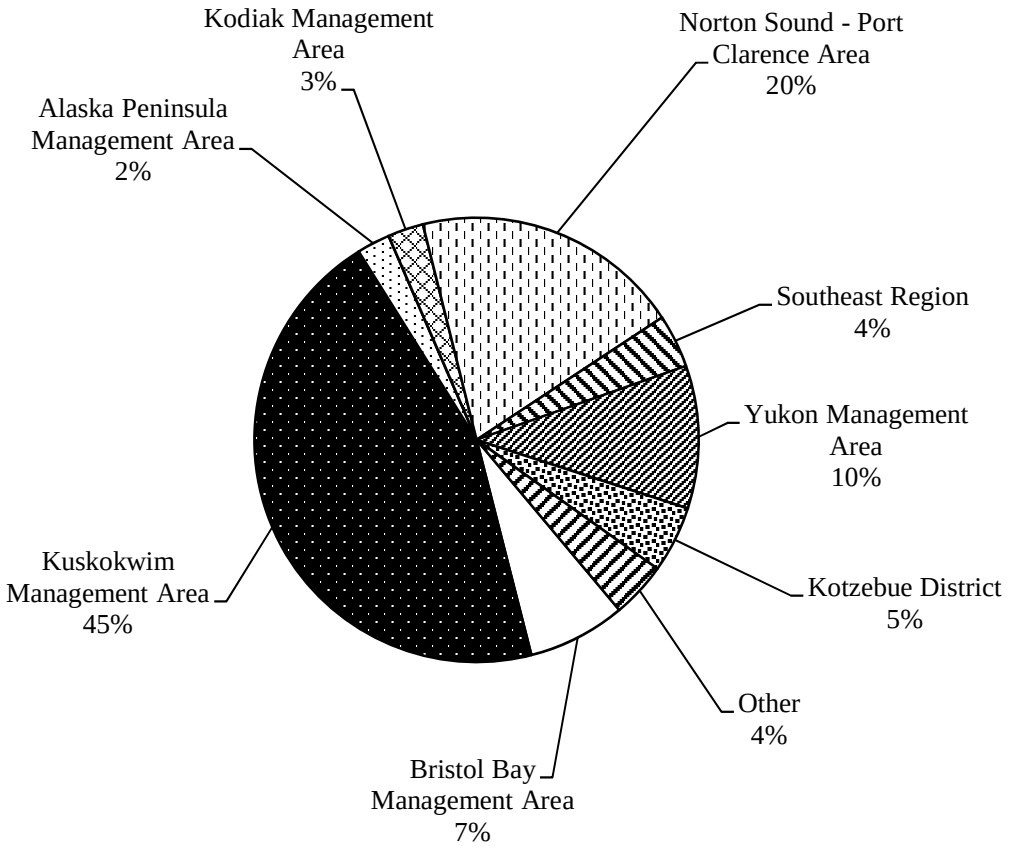
Total sockeye salmon = 332,421; Southeast Region includes Stikine River Federal Fishery

Figure 2-5.–Subsistence sockeye salmon harvest by area, 2016.



Total chum salmon = 318,241

Figure 2-6.–Subsistence chum salmon harvest by area, 2016.



Total coho salmon = 87,439; Southeast Region includes Stikine River Federal Fishery

Figure 2-7.–Subsistence coho salmon harvest by area, 2016.

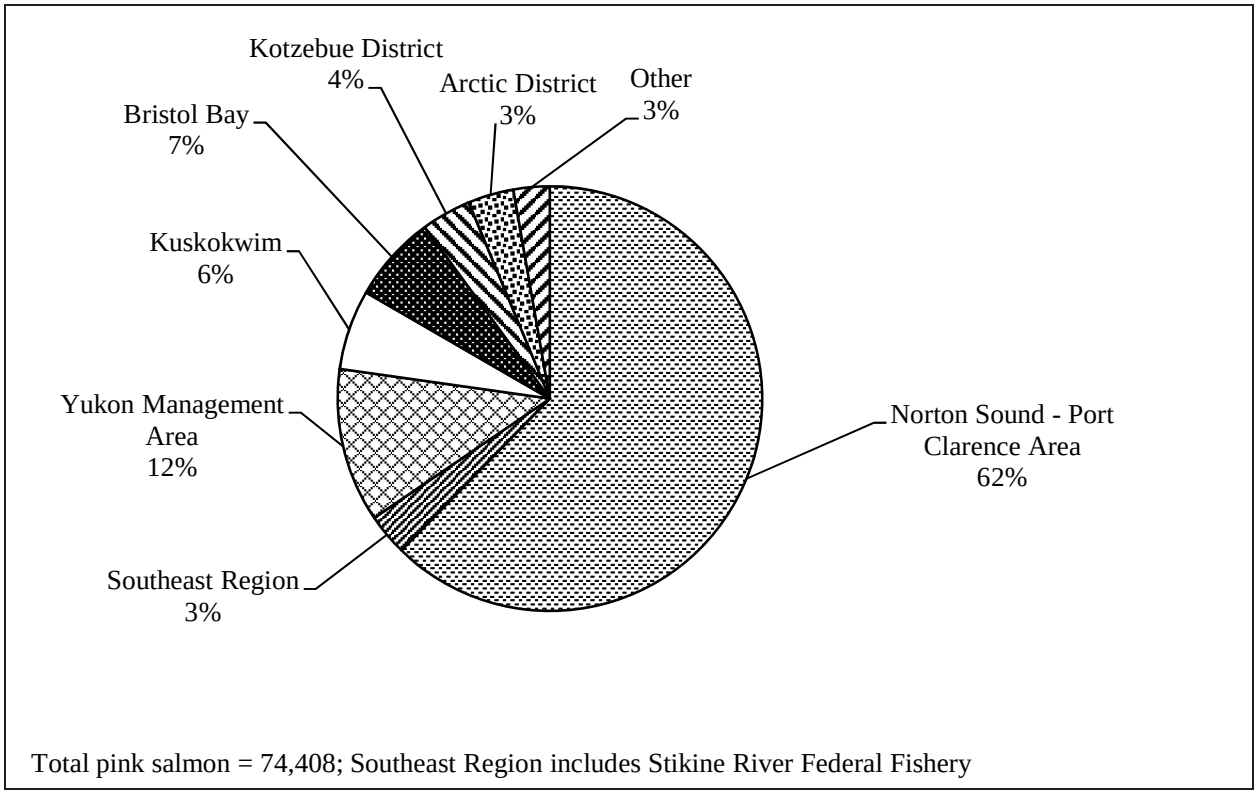


Figure 2-8.–Subsistence pink salmon harvest by area, 2016.

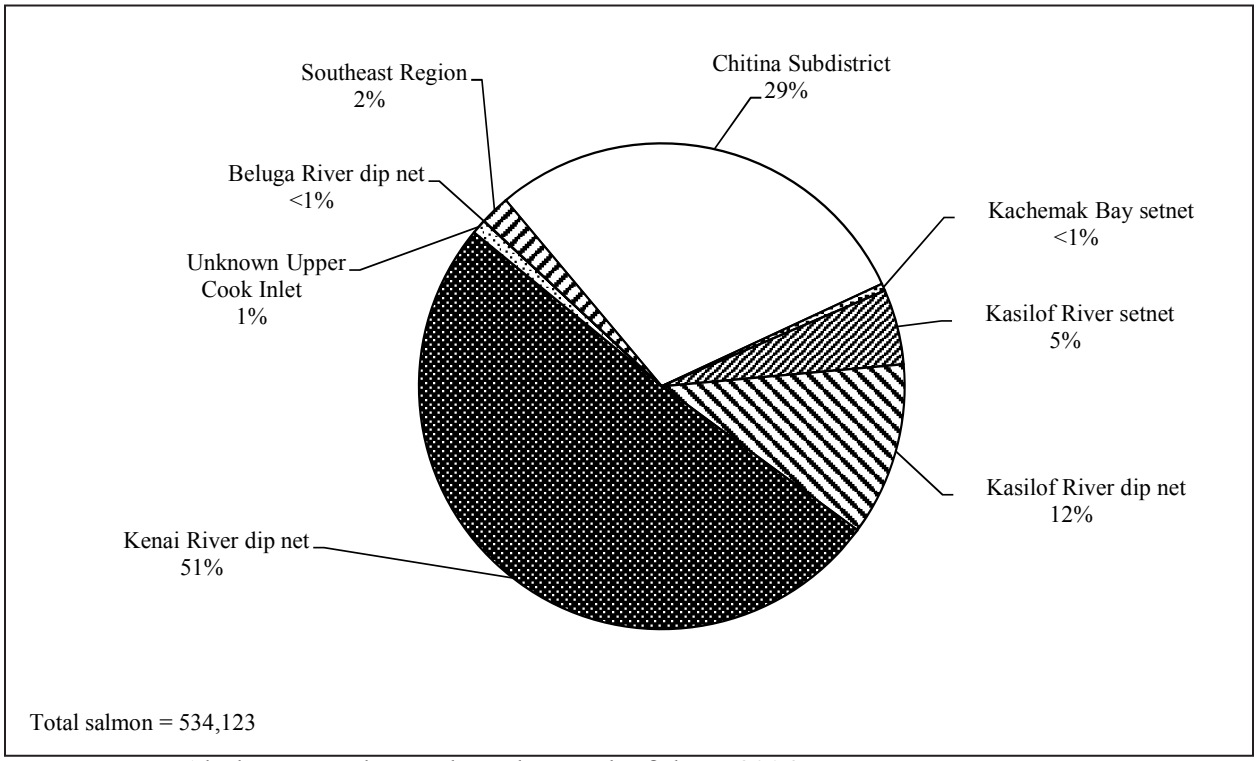
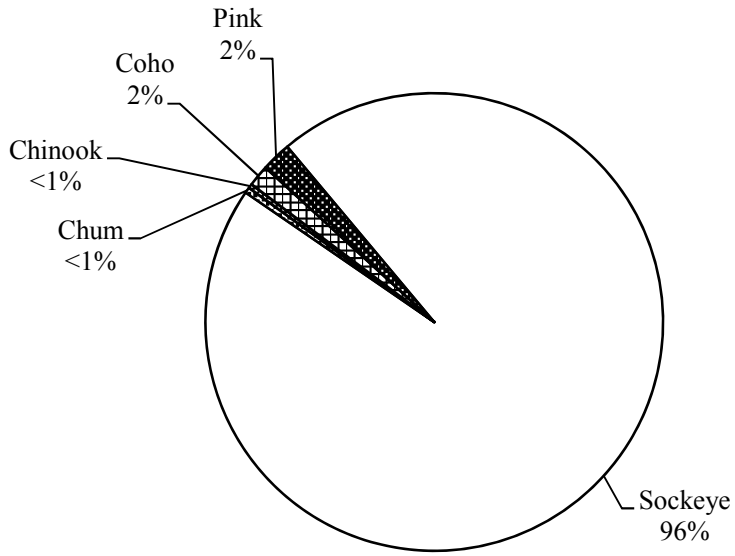
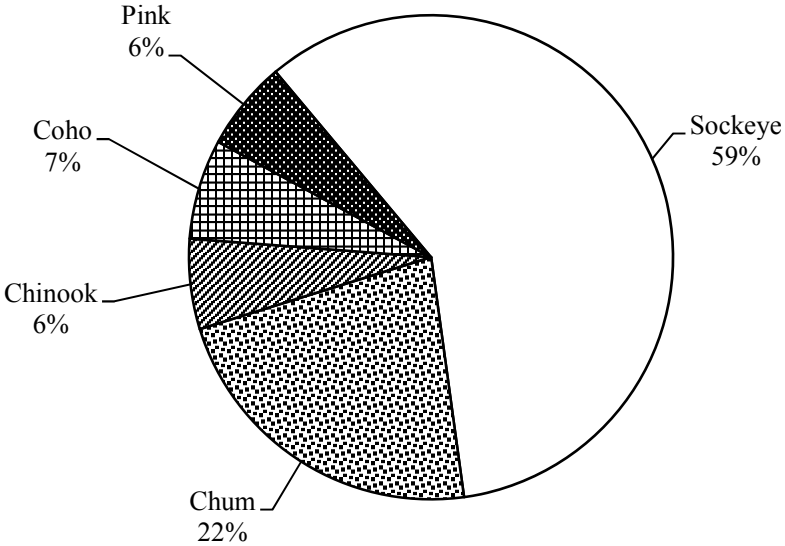


Figure 2-9.–Alaska personal use salmon harvest by fishery, 2016.



Total salmon = 534,123

Figure 2-10.–Alaska personal use salmon harvest by species, 2016.



Total salmon = 1,431,392

Figure 2-11.–Alaska subsistence and personal use salmon harvest by species, 2016.

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 2016 population of 3,763, and 13 smaller communities ranging in size from 88 (Diomede) to 756 (Unalakleet).[1] Overall, 70% of the residents of the Nome Census Area are Alaska Native, with an additional 10% reporting two 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 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 four years. Prior to that, it had been closed since 1972.

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed April 2019. http://live.laborstats.alaska.gov/pop/estimates/data/TotalPopulationPlace.xls

The Norton Sound District encompasses all waters from Point Romanof north to Cape Douglas. It is divided into six 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 two 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 2016, 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 one commercial Chinook salmon directed fishery has occurred since 2001. Restrictions were placed upon the subsistence and sport fisheries in 2003, 2004, and from 2006–2015 (Menard 2010;

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 et al. 2011; 2012; 2013; 2015a; 2015b; 2017a). 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 2016: (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 three 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 2016, 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. 2017a). The Nome ADF&G office issued a record-setting 584 subsistence (Tier I) salmon permits[5]. This was an increase from the 529 permits issued in 2015, and greater than the previous record of 494 permits issued during the 2010 fishing season (Menard et al. 2015b; 2017a) (Table

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 (584) is slightly different than the number reported by (Menard et al. 2017a:44). 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

3-1). A total of 370 households fished their permits, with the largest number of permits fished on the Nome River (233) and Snake River (89) (harvests largely came from those rivers, the Bonanza River, the Solomon River, and marine waters) (Menard et al. 2017a).

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 2016, seven permits were issued for the Cape Woolley Area; all were returned to ADF&G (Table 3-1). Of those, two households fished their permits (Menard et al. 2017a).

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 2016, 166 permits were issued for Subdistrict 2; 164 permits were returned (Table 3-1); 87 households reported fishing (Menard et al. 2017a). 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 2016, ADF&G issued 56 permits for Subdistrict 3 (Table 3-1); the number of issued permits has ranged from 60 (2011) to 66 (2014) in recent years. All permits were returned and 43 households reported fishing, a slight increase from the 40 in 2015 (Menard et al. 2013; 2015a; 2015b; 2017b; 2017a).

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 2016, 663 Port Clarence and Pilgrim River permits were issued[6], above the 549 issued in 2015 and the former record of 431 issued in 2013 (tables 3-2 and 3-3). Of the permits issued in 2016, 506 were to fish the Pilgrim River only, much more than the former record of 377 in 2015 (all but one were returned with 278 having been fished). One permit was issued for Salmon Lake, and 157 were issued for other waters in the district (157 were returned with 105 having been fished) (Menard et al. 2017a: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; 2015a). 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 et al. 2015b). 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. 2017b:50). ADF&G did not operate the Glacial Lake weir in 2016, however aerial surveys counted 1,582 sockeye salmon, which is well within the escapement of 800–1600 fish. At the Pilgrim River weir the count was 15,066 sockeye salmon in 2016 (Menard et al. 2017a)

fisher from the Golovin subdistrict receives a permit to fish in Nome, the permit will be counted in the Golovin district total).

6. The number of Port Clarence permits cited in Table 3-2 (659) are those permits that were actually returned, the total number of permits issued was 663. Menard et al. (2014:70) has a total of 664 permits issued, however one permit was a duplicate.

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 et al. 2015a; 2015b). In 2015 and 2016, one permit was issued for Salmon Lake, which was not fished in either year (Menard et al. 2017a).

Household Surveys

In 2016, 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: 256 of 266 Unalakleet households (96%) were contacted, as were 67 of 68 Shaktoolik households (99%), 63 of 73 Koyuk households (86%), 133 of 142 Stebbins households (94%), and 93 of 101 St. Michael households (92%). 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 2016

Norton Sound District Subsistence Salmon Harvest

The estimated 2016 subsistence harvest of salmon by communities in the Norton Sound District was 80,781 fish, more than the 2015 harvest of 65,712 fish (tables 3-1, 3-2). The 2016 harvest was the fourth largest odd-year harvest since 2004 but lower than the average of even-number years 1994–2014 (92,632). 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 2016, the total Norton Sound pink salmon subsistence harvest (42,051 fish) was the fifth highest even year since 2004 but lower than the even-year average of 52,931 pink salmon. Chum salmon harvests (18,144) were slightly lower than the historical average of 18,153 from 1994—2014. Coho harvests (16,514) were slightly higher than the 1994–2014 average harvest of 16,016 coho salmon.

Total Norton Sound subsistence catches of three out of the five salmon species were higher in 2016 than 2015. Fishers caught fewer sockeye and chum salmon, although Chinook, coho, and pink salmon harvests showed modest increases (Table 3-2). Overall the estimated 2016 subsistence salmon harvest was slightly lower than the average for even years from 2002 to 2014 (82,981 fish). Between 1994 and 2015, even-year harvests of all salmon have ranged from a low of 67,149 in 2010, to a high of 134,050 in 1996, with a 1995–2015 average of 92,632 salmon. Odd-year harvests have ranged from the low in 2011 of 43,883 to a high of 113,612 in 1995, with an average of 69,934 salmon.

Chum salmon abundance in 2016 was expected to provide for both subsistence and commercial harvests, and for the fourth consecutive year after a 20-year hiatus, commercial fishing for chum salmon occurred in the Nome Subdistrict (Menard et al. 2017a). Targeted coho salmon fishing occurred for the first time in two decades in the Nome subdistrict as well. The combined commercial salmon harvest in Norton Sound was the third highest in 10 years. Chum salmon escapement was lower in 2016 in comparison with the last several years, however those years were among the highest escapements in the last two decades. Escapement goals for chum salmon were exceeded in all rivers, however the escapement goal was not reached at the Kwiniuk River counting tower in the Elim subdistrict. There are only two coho salmon escapement goals in the Norton Sound district, which are aerial survey goals. The North River goal of 550–1,100 was probably

achieved although an aerial survey was not flown; the tower count for 18 days was 2,241 fish, which probably accounted for less than half of the total fish due to high water impeding accurate counts. The Kwiniuk River goal of 650–1,300 coho salmon was easily exceeded with an aerial survey count of 1,987 fish. There were near record runs of pink salmon in Norton Sound in 2016, however, in the Port Clarence District, pink salmon escapement of 2,986 to the Pilgrim River was the lowest of any even-number year of the 14 years of this escapement project.

Chinook salmon runs were much weaker in Norton Sound in 2016 compared to 2014 and 2015. The lower end of the SEG goal was not met, with 135 Chinook salmon counted at the Kwiniuk River weir. 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 Unalakleet River weir was inoperable because of high water after July 20, and the count of 505 Chinook salmon was less than 50% of the recent average for that date.

Subdistrict 1 Harvest

Regulation changes were made at the 2013 Alaska Board of Fisheries meeting, which allowed for subsistence gillnet fishing seven 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 2016. The Board also passed regulations in 2015 allowing for a commercial chum salmon fishery in the Subdistrict based on conservative management guidelines. Additionally, regulation changes in 2016 increased subsistence gillnet fishing in the marine waters in the western half of Subdistrict 1 from three days to five days a week and fresh water subsistence gillnet fishing throughout Subdistrict 1 was increased from four days to five days a week. For the eleventh 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 pink salmon were reported, and aerial surveys were flown in mid-July in the eastern Nome Subdistrict drainages of the Flambeau and Bonzanza rivers and the western drainage of the Sinuk River. A large run of pink salmon obscured the chum salmon count on these surveys, however the Eldorado River, Nome River, and Snake River weir counts exceeded the chum escapement goal ranges in 2016. Because of this, subsistence gillnet fishing continued on the standard freshwater schedule. Overall, the chum salmon subsistence harvest was the third 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. 2017a). The estimated 2016 subsistence salmon harvest in the Nome Subdistrict was 3,260 chum salmon, 10,101 pink salmon, 2,274 coho salmon, 601 sockeye salmon, and 26 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 (78% of fish in Subdistrict 2 and 75% in Subdistrict 3). Chum and coho salmon made up most of the rest, with some Chinook and a few sockeye salmon. In 2016, a total of 8,661 salmon were harvested in Subdistrict 2 (Golovin) (Table 3-1). This was the sixth lowest harvest year in the 2000s, largely due to the lower harvests of chum, coho, and pink salmon in the district (Menard et al. 2017a). Pink salmon composed 78% of the number of salmon harvested, with 12% chum, 10% coho, and Chinook, and sockeye salmon making up the rest of the harvest (less than 1%, respectively). In 2016, high water precluded accurate counts and the project was suspended on July 30. 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 (Menard et al. 2017a). The chum salmon escapement goal was not met at the Kwiniuk counting tower in 2016. There was a change to the commercial fishing schedule in Subdistrict 2 in 2016, when the buyer requested daily 16-hour fishing periods 6 days a week during the majority of

the chum salmon season instead of the usual two 48-hour fishing periods a week in order to improve fish quality. After the third week of July, when coho salmon started to appear in the catch, the buyer requested a return to two 48-hour fishing periods a week.

Based upon subsistence fishing permits, residents of Golovin harvested an estimated 2,956 salmon in 2016, the majority of which were pink salmon (2,306 fish, 78%; Table 3-4). Chum and coho salmon harvests (358 fish, 12%, and 253 fish, 9%, respectively) filled out the bulk of the remainder. Chinook salmon (20) and sockeye salmon harvests (19) contributed less than 1% to the total Golovin salmon harvest, respectively. White Mountain residents harvested an estimated 4,827 salmon, 3,789 (78%) of which were pink salmon. The remainder of the harvest was chum salmon (640) at 13%, and coho salmon (358) at 7%, and sockeye salmon (25) and Chinook salmon (15) at less than 1%, respectively.

In Subdistrict 3 (Moses Point/Elim), The Elim Subdistrict commercial fishing schedule was the same as the Golovin Subdistrict with daily 16-hour fishing periods 6 days a week until the third week of July when the two 48-hour fishing periods a week resumed. The only difference in the 16-hour daily fishing schedule was the buyer had Golovin closed to fishing on Tuesdays and Elim on Thursdays (Menard et al. 2017a). The 2016 pink salmon run was one of the largest on record. Subsistence fishers harvested an estimated 8,934 salmon, 75% of the fish were pink salmon, 13% coho salmon, 9% chum salmon, 2% Chinook salmon, and less than 1% sockeye salmon (Table 3-1). The total harvest of 8,934 salmon in 2016 was above recent 5-year and 10-year averages (Menard et al. 2017a).

Subdistrict 4 Harvest

In 2016, ADF&G restricted subsistence fishing in Subdistrict 4 to two 48-hour periods a week through the month of June in order to protect Chinook salmon. The first fishing period each week had 6-inch mesh restrictions for gillnets, and the second had no mesh size restrictions. Like subdistricts 2 and 3, the commercial fishing schedule was 16-hour daily fishing periods, but fishing was closed on Wednesdays. After the third week of July, fishing periods were two 48-hour fishing periods a week (Menard et al. 2017a). Fishers caught an estimated 6,107 salmon for subsistence in the Norton Bay subdistrict (Table 3-1). Most of the harvest was made up of chum and pink salmon (45% and 32%, respectively). Of the remainder, 15% were coho salmon, 4% were Chinook salmon, and 4% sockeye salmon (Table 3-1).

In 2016, the ninth 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 6,303 salmon, the majority of which were chum salmon (43%) and pink salmon (34%). Households caught lesser amounts of coho (15%), chinook (4%), and sockeye (4%) 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 2016, the season also began with closure early in the season (June 8); however, even with the subsistence restrictions in place in 2016, from mid-June onward the Chinook salmon run was very weak. Limited openings by emergency order occurred throughout the month of June. As a consequence of the poor Chinook salmon run, directed chum salmon fishing was delayed until after June 30 based upon the Shaktoolik and Unalakleet Subdistricts management plan (Menard et al. 2017a). 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-inch or less and prohibiting the retention of any Chinook salmon caught with a 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 one 24-hour fishing period the first week. The buyer had capacity issues with the number of pink salmon caught and limited

fishing periods to 12 hours or less through July 20. The usual two 48-hour fishing periods a week did not begin until late July when pink salmon catches began to slow and coho salmon catches increased (Menard et al. 2017a). Both Subdistricts 5 and 6 had similar commercial catches of chum salmon; Shaktoolik fishers harvested 12,149 chum salmon (the lowest harvest since 2009) and Unalakleet fishers harvested 12,229 (the lowest since 2007). Unalakleet commercial fishers caught significantly more pink salmon (86,466) and coho salmon (53,173) than Shaktoolik fishers (28,308 and 25,849, respectively).

In subdistrict 5 (Shaktoolik), subsistence fishers caught an estimated 6,308 salmon in 2016, over half of which (3,543 or 56%) were pink salmon. Coho salmon (1,854) composed 29% of the total harvest. The rest of the harvest was composed of chum salmon (558) and Chinook salmon (251), which provided 9% and 4% 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 21,503 salmon, 50% (10,783) of which were pink salmon. Coho salmon (6,623) made up 31% of the annual harvest, followed by chum salmon (3,058 or 14%), and Chinook salmon (687 or 3%). Two percent of the total harvest was sockeye salmon (Table 3-1).

Table 3-4 presents 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 2016.

Stebbins and St. Michael

Household surveys have been conducted sporadically in Stebbins and St. Michael since 1994, most recently in 2012, 2014, 2015, and 2016. 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 2016, Stebbins residents harvested 8,106 salmon, the majority of which were chum salmon (3,658 fish, 45%), coho salmon (1,893 fish, 23%), and pink salmon (1,874 fish, 23%). The remaining harvest was composed of Chinook salmon at 8%, and sockeye salmon at >1% of the total harvest (Table 3-1). This was similar to the most recent even-numbered year when 8,068 salmon harvested by Stebbins residents in 2014.

In 2016, St. Michael residents harvested 4,868 salmon, the majority of which were chum salmon (3,051 fish, 63% of the harvest). Coho salmon (933 fish) composed 19% of the harvest, Chinook salmon (567) composed 12%, pink salmon (317) composed 7%, and there was no harvest of sockeye salmon (Table 3-1). This was lower than the 2015 harvest of 6,141 salmon.

Norton Sound Harvest Overall

Of the estimated total 2016 subsistence salmon harvest in Norton Sound, 2% were sockeye salmon, 3% were Chinook salmon, 20% were coho salmon, 22% were chum salmon, and 52% were pink salmon (Figure 3-1). Total harvest estimates for the Norton Sound District for 1994–2016 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 2016 subsistence salmon harvest was taken by residents from outside the district. Thirty-eight subsistence permits were issued to residents of Anchorage, Fairbanks, Eagle River, Palmer, Kodiak, and Wasilla; their combined total salmon harvest was 630 salmon (Table 3-4).

Port Clarence District Subsistence Salmon Harvest

The estimated 2016 subsistence harvest of salmon in the Port Clarence District was 21,432 fish (tables 3-2 and 3-3). This harvest was similar to the highest on record in 2014 (21,699) and greater than the 10-year average (2005–2014) of 14,620 fish. Of the total salmon harvest, less than 1% was Chinook salmon, 3% was coho salmon, 20% was pink salmon, 20% was chum salmon, and 57% 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 Kotzebue 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 (Braem et al. 2018), 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

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.

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 from 2012–2014 (Mikow et al. 2016). 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.

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 three 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

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 et al. (2018).

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 three years of data must be available upon which to interpolate an estimate for a missing year for a community;
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 three available estimates are used for each gap year;
4. In the event that two years are tied for being closest to a gap year, the most recent estimate is used;
5. Interpolated values using data available for this report have remained unchanged from the 2015 report and will remain the same 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 seven 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;

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.

7. Shishmaref is an exception; it has been excluded from the core communities even though three harvest estimates are available, because of the large variability in those three 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 nine 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, which is also used for 2016 (Table 3-8). Because no salmon harvest surveys were conducted for any district community for 2015 or 2016, all the values in Table 3-8 for nine core communities are interpolated, and the 2014 harvest estimate for Point Hope was used to represent the 2015 and 2016 harvests. The harvest estimate for the district was 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, 1994–2016, 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 six of the eight 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 three 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 or 2016. To fill this gap, harvest estimates for four communities (Barrow, Nuiqsut, Point Lay, and Wainwright) for 2014 were used as estimates for 2015 and 2016. 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 2016 of 183,699 salmon was composed primarily of chum (91,372 salmon; 50%) and pink (51,788 salmon; 28%). The total salmon harvest for the combined areas in 2016 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, Norton Sound-Port Clarence Area, 2016.

Subdistrict	Households surveyed or permits returned	Estimated salmon harvest[a]					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Cape Woolley	7	30	3	0	0	0	33
Elim	56	163	60	1,164	830	6,717	8,934
Golovin	164	35	29	844	1,006	6,747	8,661
Nome	584	26	601	2,274	3,260	10,101	16,262
Norton Bay	75	241	235	929	2,724	1,978	6,107
Shaktoolik	67	251	111	1,854	558	3,534	6,308
St. Michael	93	567	0	933	3,051	317	4,868
Stebbins	133	649	32	1,893	3,658	1,874	8,106
Unalakleet	256	687	352	6,623	3,058	10,783	21,503
Total	**1,435**	**2,649**	**1,423**	**16,514**	**18,144**	**42,051**	**80,781**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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

Table 3-2.–Historic subsistence salmon harvests by district, Norton Sound-Port Clarence, and Arctic-Kotzebue Areas, 1994–2016.

	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
2016	1,435	2,649	1,423	16,514	18,144	42,051	80,781
5-year average (2010–2014)	1,160	1,606	838	13,776	18,005	29,495	63,720
10-year average (2005–2014)	1,129	2,536	736	14,818	15,490	33,887	67,467
Historical average (1994–2014)	1,032	4,490	880	16,016	18,543	41,355	81,283

	Port Clarence District						
Year	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

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Year	Norton Sound District						
	Number of households	Chinook	Sockeye	Coho	Chum	Pink	Total
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
2016	659	40	12,140	627	4,303	4,322	21,432
5-year average (2010–2014)	403	45	5,223	572	5,609	3,504	14,953
10-year average (2005–2014)	374	66	5,307	658	4,726	3,863	14,620
Historical average (1994–2014)	278	117	4,618	1,037	3,646	3,655	13,073

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[gh]	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[ij]	666	343	2,025	4,603	54,698	3,608	65,277
2007[ij]	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[ij]	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

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Year	Kotzebue District[b,c] Number of households	Chinook	Sockeye	Coho	Chum	Pink	Total
2016[n]	854	613	783	4,259	64,678	2,821	73,154
5-year average (2010–2014)	771	387	1,252	3,868	63,121	2,394	71,020
10-year average (2005–2014)	670	286	1,072	3,241	59,539	2,002	66,141
Historical average (1994–2014)	834	258	681	2,217	64,249	1,603	69,008

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
2016	432	126	519	846	4,247	2,594	8,332
Historical average (2012–2014)	290	87	317	579	2,385	1,671	5,038

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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. Also inlcudes Buckland.

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

j. Harvest survey data exist in 2006, 2007 and 2011 for Kiana (2006), Shishmaref (2006), Wales (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.

Table 3-3.–Subsistence salmon harvests by district, Norton Sound-Port Clarence, and Arctic-Kotzebue areas, 2016.

District	Households surveyed or permits returned	Estimated salmon harvest[a]					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Norton Sound District[b]	1,435	2,649	1,423	16,514	18,144	42,051	80,781
Port Clarence District[c]	659	40	12,140	627	4,303	4,322	21,432
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	**3,275**	**3,427**	**14,864**	**22,246**	**91,372**	**51,788**	**183,699**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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 2016. 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 2016 harvests.

Table 3-4.–Subsistence salmon harvests by community, Norton Sound-Port Clarence Area, 2016.

Community[b]	Households or permits		Estimated salmon harvest[a]					
	Total	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Anchorage	15	14	0	162	0	64	130	356
Brevig Mission	41	41	18	1,304	481	2,164	2,582	6,549
Elim	51	51	160	60	1,164	824	5,985	8,193
Fairbanks	9	9	0	68	11	27	17	123
Gambell	2	2	0	0	0	0	0	0
Golovin	25	24	20	19	253	358	2,306	2,956
Kodiak (city)	2	2	0	0	1	1	12	14
Koyuk	73	63	241	235	949	2,734	2,144	6,303
Nome	1,236	1,228	73	9,817	2,515	3,553	11,688	27,646
Palmer	10	10	0	137	0	0	0	137
Savoonga	3	3	0	0	0	1	21	22
Shaktoolik	68	67	251	111	1,854	558	3,534	6,308
St. Michael	101	93	567	0	933	3,051	317	4,868
Stebbins	142	133	649	32	1,893	3,658	1,874	8,106
Teller	51	50	8	1,241	106	1,757	1,191	4,303
Unalakleet	266	256	687	352	6,623	3,058	10,783	21,503
Wasilla	2	2	0	0	0	0	0	0
White Mountain	33	33	15	25	358	640	3,789	4,827
Total	**2,130**	**2,081**	**2,689**	**13,563**	**17,141**	**22,447**	**46,373**	**102,213**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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

b. Harvest information from residents of nonlocal communities (e.g. Anchorage) is available only for Norton Sound and Port Clarence permit areas. Nonlocal 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.

		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.

		Households		Estimated number of fish									
Year	Community	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
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

-continued-

Table 3-6.–Page 2 of 2.

Year	Community	Households		Estimated number of fish									
		Total	Surveyed	Dolly	Arctic	Burbot	Broad	Humpback	Unknown	Northern	Saffron	Sheefish	Total
2014	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		**1,808**	**956**	**19,593**	**10,392**	**1,458**	**48,897**	**24,041**	**576**	**15,796**	**63,181**	**30,663**	**214,598**

Source ADF&G Division of Subsistence, household surveys, 2007, 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 Districta communities, 2016.

	Households		Estimated salmon harvest[b]					
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[c]	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. No new data collection occurred for 2016, estimates provided are based on 2015 estimates.

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

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

		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.

		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
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

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Table 3-11.–Page 2 of 2.

		Estimated Number of Salmon Harvested						
Community	Year	Chinook	Sockeye	Coho	Chum	Pink	Unknown	Total Salmon
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[d,e]	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. 2009
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.

Table 3-12.–Estimated subsistence salmon harvests for Arctic District communities, 2016.

	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 2016 harvests.

Table 3-13.–Historical subsistence salmon harvests, Norton Sound, Port Clarence, Arctic, and Kotzebue districts, 1975–2016.

	Households or permits		Estimated salmon harvest[a]					
Year	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
2016	5,619	3,275	3,427	14,864	22,246	91,372	51,788	183,699
5-year average (2011–2015)	3,661	2,245	2,078	7,172	18,409	86,939	36,298	150,896
10-year average (2006–2015)	2,962	1,966	2,909	7,045	18,813	79,858	40,204	148,829
Historical average (1994–2015)	2,593	1,726	4,882	6,151	19,374	86,586	46,947	163,941

-continued-

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Note Since 1994 ADF&G has conducted annual subsistence salmon harvest assessment efforts in Northwest Alaska that provide more extensive and reliable estimates than those for earlier years. Harvest estimates prior to 1994 cannot be directly compared with those of previous years.

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 post-season 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.

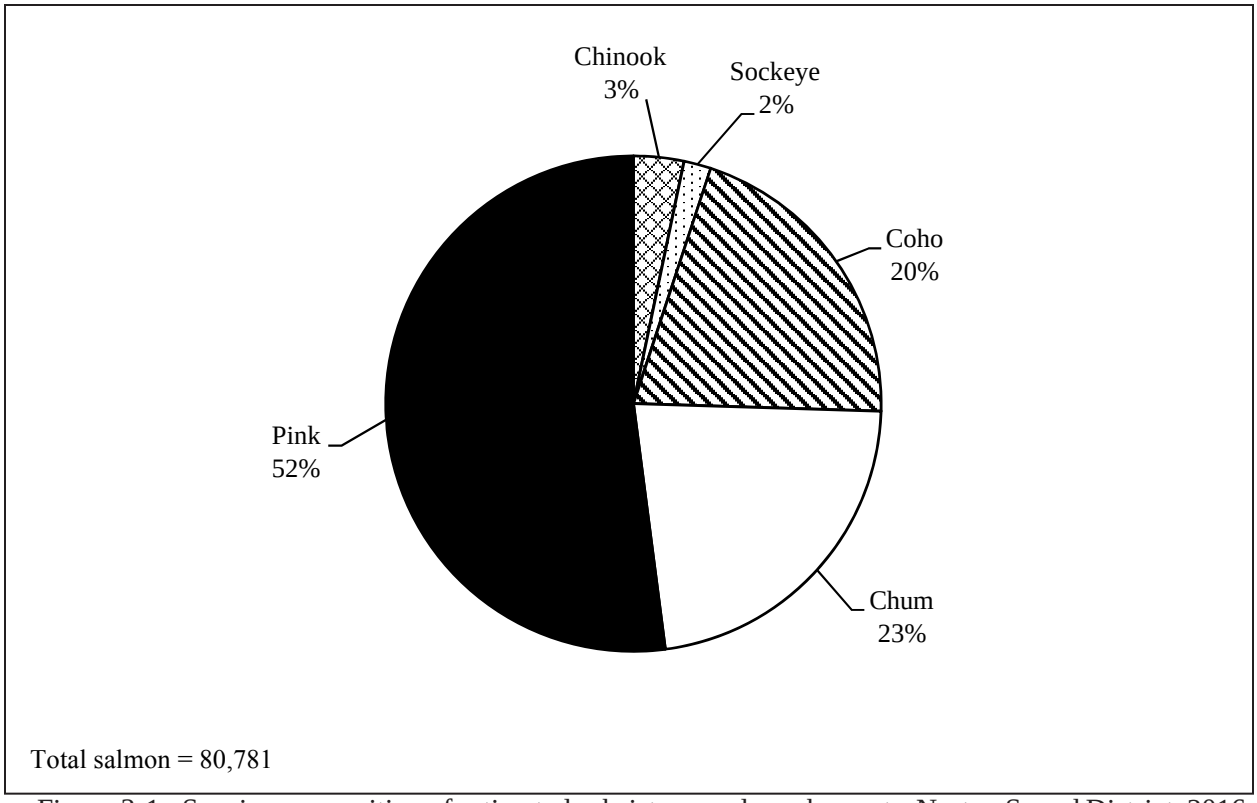

Figure 3-1.–Species composition of estimated subsistence salmon harvests, Norton Sound District, 2016.

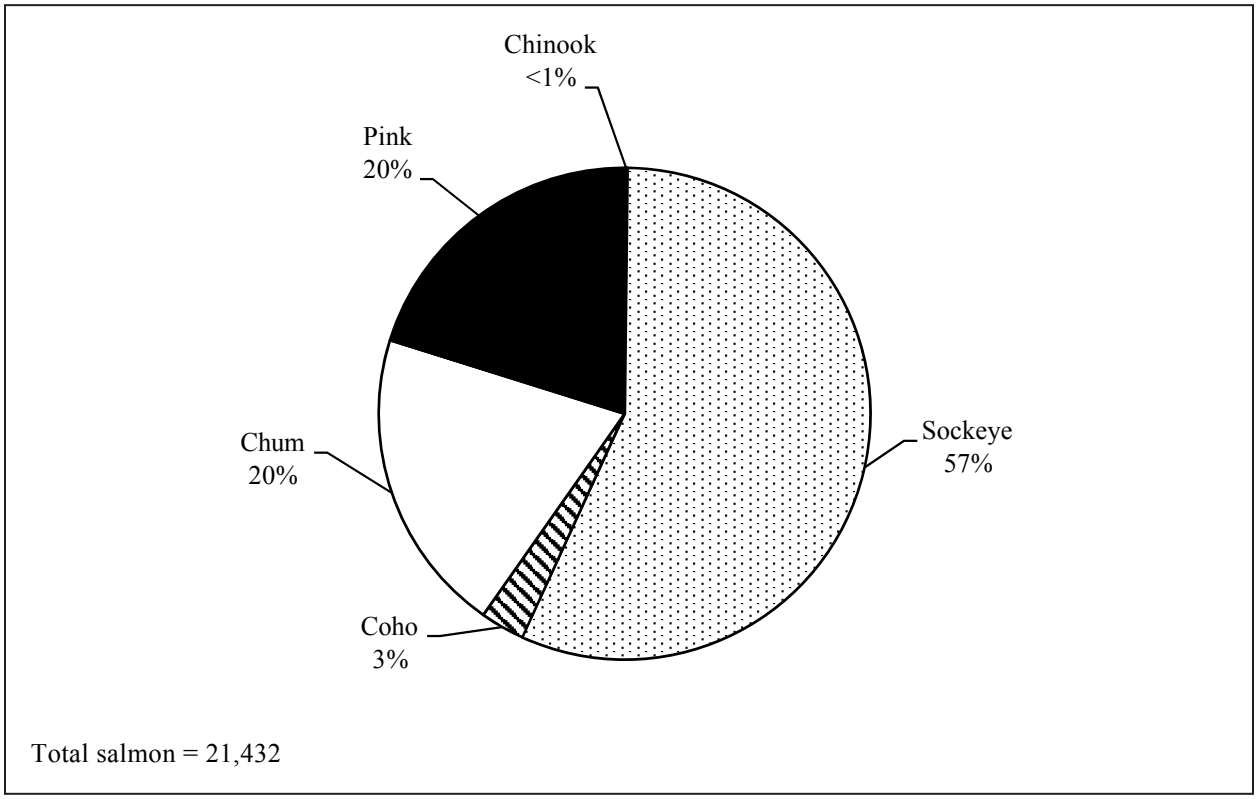

Figure 3-2.–Species composition of estimated subsistence salmon harvests, Port Clarence District, 2016.

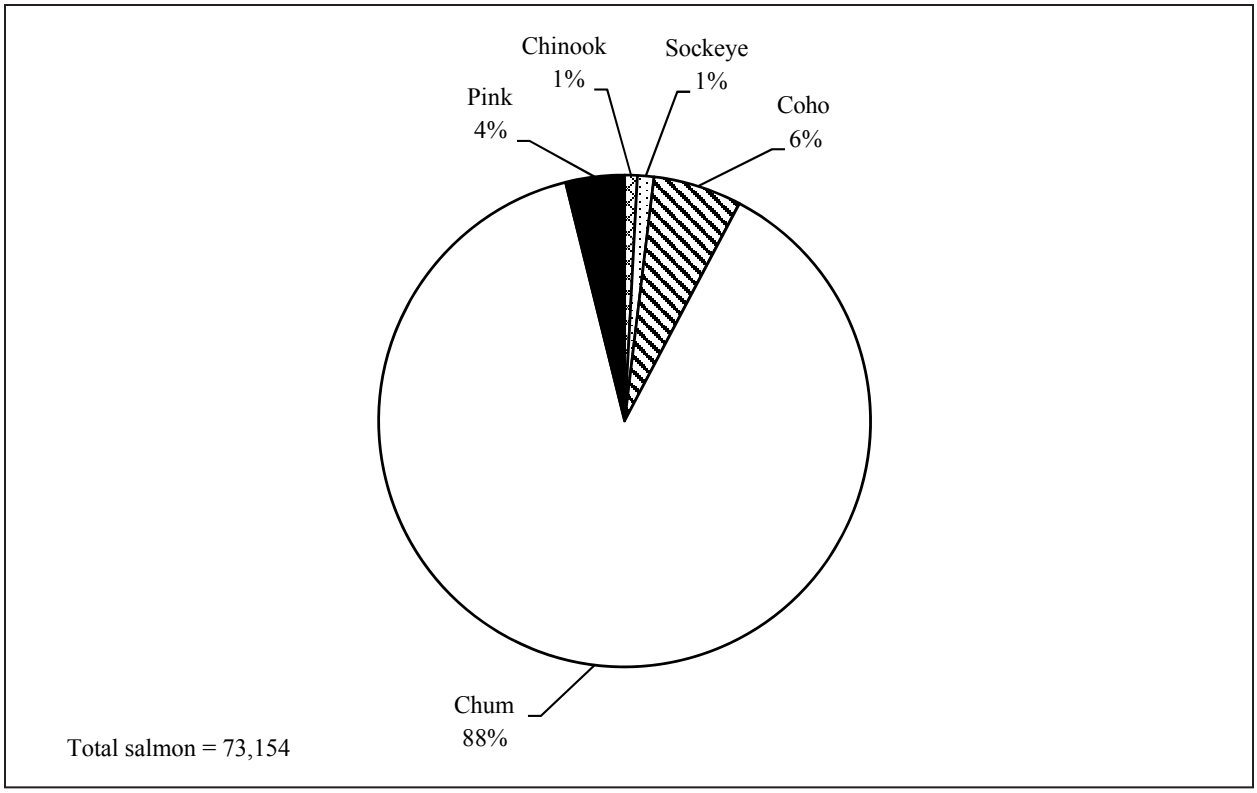

Figure 3-3.–Species composition of estimated subsistence salmon harvests, Kotzebue District, 2016.

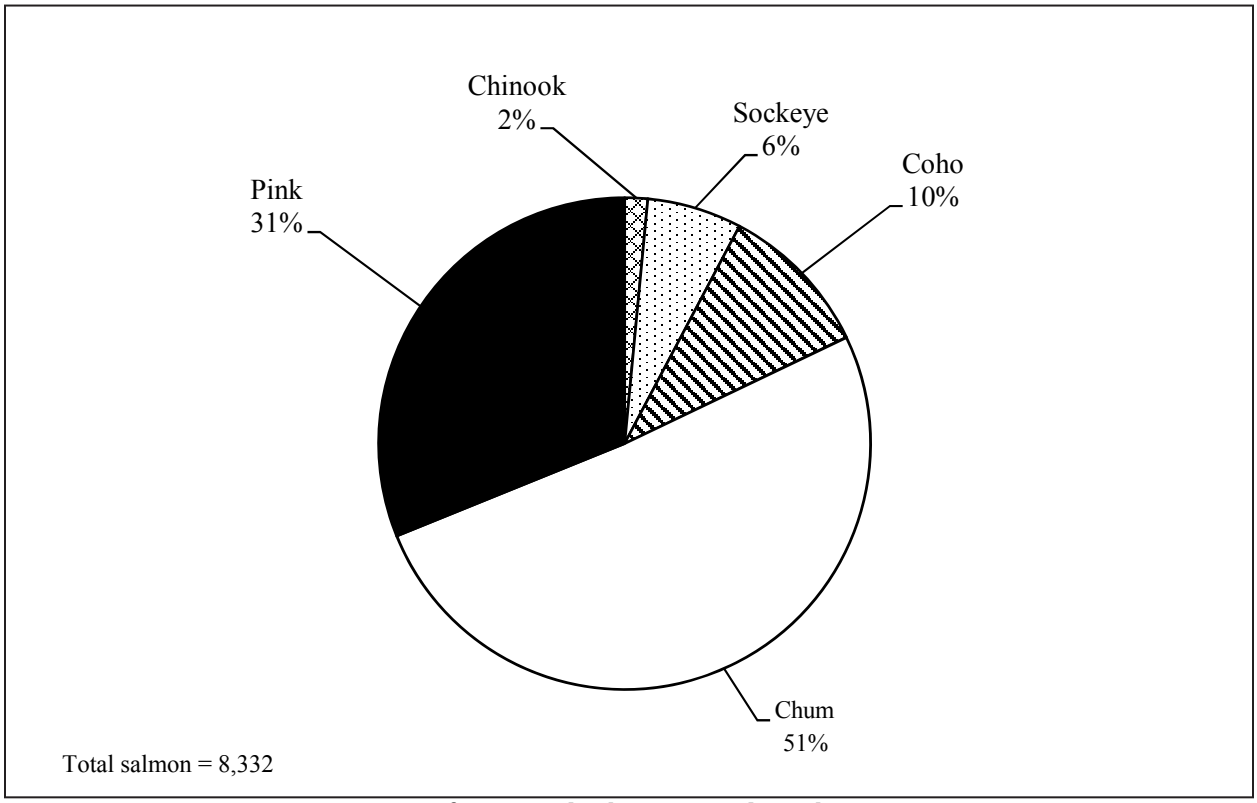

Figure 3-4.–Species composition of estimated subsistence salmon harvests, Arctic District, 2016.

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 the lower half of the river. Under state regulations, drift gillnets are allowed from the mouth of the Yukon River through District 4. Federal regulations also allow use of drift gillnets in District 4. Fish wheels are a legal subsistence gear type throughout the Yukon River 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 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

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

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.

In 1993, the BOF made a positive Customary & Traditional 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). In 2001, the BOF made species-specific ANS determinations for each of four 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.

Over the last few 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 seven 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 summer season commercial fishing period in districts 1, 2, or 3 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 seven days per week.

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). The Yukon River Chinook salmon stock has retained this designation to present date, with the designation being most recently renewed at the 2016 BOF

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 three miles upstream of Totchaket Slough (the Old Minto area), subsistence fishing is allowed five 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.

meetings. 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 fall season salmon fishing 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 This designation was lifted in 2007 after abundance showed improvement.

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 (5 AAC 01.210). 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 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 seven 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. This regulatory salmon fishing schedule is shown in Table 4-1.

In 2005, the Federal Subsistence Board (FSB) established a subsistence drift gillnet fishery in subdistricts 4B and 4C, which included the mainstem Yukon River villages of Galena and Ruby. Prior to this fishery, drift gillnets were only permitted for subsistence fishing in District 4A and downriver.

Chinook salmon abundance saw a modest increase between 2004 and 2007, but declining Chinook salmon runs in 2008 required fishing restrictions to again be increased. Restrictions have been implemented through both period closures and limitations on the types of gear allowed for 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]

In 2011, area managers implemented a 2010 Board of Fisheries decision to reduce the maximum stretched mesh net size to 7.5-inch. Prior to this, Yukon Area fishers widely used 8–8.5-inch 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-inch or larger mesh nets in exchange for new, 7.5-inch 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 since this time have primarily limited net sizes to 6-inch mesh or less and have kept fishermen from actually using the 7.5-inch mesh nets received through these programs.

At their 2013 meeting, the BOF adopted 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)).

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

Overview of 2016 Management Strategies[5]

By regulation, salmon management on the Yukon River is divided into two seasons: 1) summer—which encompasses the Chinook and summer chum salmon runs beginning in late May or early June and 2) fall—which includes fall chum and coho salmon runs which begins on July 16th in District 1 (5 AAC 01.249). Preseason run size projections are calculated to assist management and fishers on the Yukon prepare for what to expect during the upcoming season. The preseason outlook for the drainagewide Chinook salmon run was projected to be below average (130,000–175,000 fish) (JTC 2017:4)[6]. Canadian-origin Chinook salmon, which compose a portion of the total run, were anticipated to range between 65,000–88,000 fish. The 2016 summer chum salmon run was expected to be average to above average and come in slightly lower than the 2015 run of approximately 1.8 million fish. This was anticipated to be enough to provide for escapement, a normal subsistence harvest, and a surplus for commercial harvest ranging from 450,000 to 950,000 fish. Fall chum salmon were expected to have a below average run size for even numbered years (550,000 to 780,000 fish), but were still expected to provide for escapement, subsistence harvests, and a projected commercial harvest of 50,000 to 230,000 fish (JTC 2017:51). Coho salmon runs were projected to be below average to average, based on average survival of the 2012 parent year and good productivity in 2014 and 2015 (JTC 2016:55).

In an effort to gather input from fishermen and other stakeholders, YRDFA held an annual preseason meeting with U.S. management agencies including ADF&G and USFWS in May 2016 (JTC 2017:4). Below average Chinook salmon run projections necessitated that conservative management strategies remain in place, including reduced opportunity for subsistence fishing and complete closure of the commercial Chinook salmon fishery. At the preseason meeting, 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.

Throughout both summer and fall seasons, emergency orders were issued to modify the subsistence fishing schedule to protect Chinook salmon. Ice breakup in the lower river occurred on May 3, which was three weeks earlier than the average of May 25. The first subsistence caught Chinook salmon was reported on May 23, and the first Chinook salmon caught in the Lower Yukon Test Fishery (LYTF) occurred on May 24 (JTC 2017:7). Consistent with the regulatory requirement to close fishing on the first pulse of Chinook salmon for conservation purposes, subsistence closures were initiated in districts 1–3 and the northern portion of the Coastal District on May 29. Closures were then implemented chronologically in upriver districts as the pulse migrated. Closures on Chinook salmon fishing remained in place during the entire first pulse as well as the majority of the second pulse.

As the Chinook salmon migration progressed upriver, inseason assessment projects indicated that the run size would likely fall within the preseason projection, and possibly near the upper end. To provide some subsistence and commercial fishing opportunity for summer chum salmon while still protecting Chinook salmon, managers allowed fishing with selective gear types (dip nets, beach seines, and live-release fish wheels) to target abundant summer chum salmon and nonsalmon species while requiring Chinook salmon to be released live. For the first time, dip nets and beach seines were allowed for use as selective gear in District 5, whereas prior they had only been allowed in lower districts (JTC 2017:7). Once it was determined that enough Chinook salmon had crossed the border to meet spawning escapement and harvest sharing objectives with Canada, opportunity for subsistence fishing with 6-inch or smaller mesh gillnets was provided on a reduced regulatory schedule in districts 1–5. Late in the run, short openings were also

5. Each year, two reports are published postseason which provide details about all aspects of salmon management on the Yukon River. The remaining sections of this report are based on data and information provided in those reports, JTC 2017 and Padilla et al. 2018, unless otherwise noted.
6. See also A.J. Padilla, K.S. Decker, and T. Hamazaki. *In prep.* Subsistence and personal use salmon harvests in the Alaska portion of the Yukon River drainage, 2016. Alaska Department of Fish and Game, Fishery Data Series No. YY-XX, Anchorage. Hereinafter referred to as Padilla et al. In prep.

allowed with 7.5-inch mesh nets in districts 2–5 (JTC 2017:8). Similar gear restrictions were implemented on Yukon River tributaries, including the Tanana (District 6), Koyukuk, and Innoko rivers. Due to the below average run size, ADF&G did not authorize any commercial fishing periods targeting Chinook salmon on the Yukon River and did not allow the sale of incidentally caught Chinook salmon in the commercial chum salmon fisheries in 2016 (JTC 2017:5).

The total Chinook salmon passage along the mainstem river at Pilot Station was estimated to be 177,000 fish. Spawning escapement into Canada, estimated at Eagle Sonar, was approximately 68,800 fish and was above the upper end of the goal range set in the Pacific Salmon Treaty (JTC 2017:22). This was the 3rd year in a row that Canadian border passage interim management escapement goal (IMEG) was met. Spawning escapement goals were also met for six out of eight tributaries for which they exist. The exceptions were the Henshaw Weir and the Gisasa Weir.

The preseason outlook projected the 2016 summer chum salmon run to be abundant. However, because of the concurrent run timing of Chinook and summer chum salmon, management strategies designed to protect a poor Chinook salmon run would affect and reduce the harvest of summer chum salmon. Until the majority of Chinook salmon run had passed through the Lower Yukon Area, fishers were allowed to use the selective gear types noted previously to target summer chum salmon but were required to release all Chinook salmon live. In 2016, commercial and subsistence fishing periods were not held simultaneously, at the request of fishers who attended the pre-season planning meeting. The intent of separating these fishing periods was to reduce the competition for fishing spots between commercial and subsistence fishers. In 2016, commercial fishing for summer chum salmon took place in districts 1, 2, and 6, but no commercial fishing occurred in District 4 because there was no buyer (JTC 2017:9). A total of 8,261 Chinook salmon were caught in selective gear and released back to the water alive, while 5,623 Chinook salmon were incidentally harvested during commercial chum salmon openings and kept for subsistence purposes (JTC 2017:13). Inseason assessments at Pilot Station sonar estimated the passage of summer chum at approximately 1.9 million fish in 2016, which was slightly below the historical median (JTC 2017:23). Summer chum escapements goals were met drainagewide and for the East Fork of the Andreafsky and Anvik rivers.

The fall chum salmon run was also predicted to be abundant enough to meet subsistence harvest needs and provide for a commercial fishery (JTC (Joint Technical Committee of the Yukon River US/Canada Panel) 2014:11). In 2016, the sonar near Pilot Station began counting chum salmon as fall chum salmon on July 19. All districts and subdistricts were placed on their full regulatory subsistence fishing schedules at this time, and chronologically as the fish moved upriver (JTC (Joint Technical Committee of the Yukon River US/Canada Panel) 2017:10). The total fall chum salmon passage at Pilot Station sonar was estimated to be just under one million fish, which was above the historical average (JTC 2017:11). The drainagewide run size was approximately 1.4 million fish, and escapement goals were met for the mainstem Yukon River as well as the Fishing Branch River.

In 2016, coho salmon passage at Pilot Station sonar was also above average (168,297 fish), although the entire run was not counted because sonar operations shut down before the run was complete. ADF&G identified a surplus of coho salmon and opened a coho salmon directed commercial fishery in districts 1, 2, and 5.

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 2016, 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 1,754 calendars were sent to Yukon River households. Approximately 12% of calendar recipients (211) returned harvest calendars either by mail or 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 (Padilla et al. *In prep*).

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. Strata are based on household fishing effort and households are placed into strata based on their typical previous harvest levels. Survey questions focus on Chinook, summer chum, fall chum, and coho salmon harvests, but households are also asked about other species as well, such as pink salmon (primarily taken by coastal communities), northern pike, 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. Department staff surveyed 1,441 of 3,055 households (47%) in 33 communities the Yukon Area concerning their subsistence salmon harvests in 2016 (Table 4-3).

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 two 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 three 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 534 salmon fishing permits were issued to households in the Yukon Area in 2016, including 513 subsistence and 21 personal use permits (Table 4-2). Of these permits, 503 (98%) subsistence permits and 21 (100%) personal use permits were returned to ADF&G. Of the returned permits, and approximately 60% indicated that they fished. 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.

By combining the number of households who returned permits and indicated they fished with the estimated number of fishing households from surveyed communities, approximately 1,626 households participated in the subsistence-personal use salmon fishery on the Yukon in 2016. Among surveyed communities, 65% of fishing households were located in the lower river (Coastal District through District 3), and 35% were from the upper river (districts 4 and 5). The higher concentration of fishing households in the lower river can be partly attributed to the larger population of the region.

Subsistence Salmon Harvests in 2016

The total estimated subsistence-personal use salmon harvest in 2016 was 212,682 fish (Table 4-4). This is approximately 10% lower than the average harvest over the previous five years, and 11% below the 10-year average harvest (Table 4-5). Compared to historical harvest data available since 1976, the 2016 total salmon harvest was only 67% of the historical average (1976–2015). Since 1990, the overall total subsistence salmon harvest in the Yukon Area has declined by approximately 45%. As evident in Figure 4-3, patterns of declining harvests have varied by species. Declining harvests have not necessarily been gradual or linear. Two major "crashes" stand out, disastrously low fall chum salmon harvests from 2000–2002 and similarly depleted Chinook salmon harvests since 2013.

Broken down by species, the estimated subsistence–personal use salmon harvest for the entire Yukon Area included 21,684 Chinook salmon (10% of the estimated total salmon harvest), 88,258 summer chum salmon (41%), 84,933 fall chum salmon (40%), 9,088 coho salmon (4%), and 8,719 pink salmon (4%), for a total of 212,682 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.

Chinook salmon harvests in 2016 were an improvement over the previous three years, which were the lowest on record. As shown in Table 4-5 and Figure 4-3, the 2016 Chinook salmon harvest estimate was slightly higher than the most recent Yukon Area 5-year averages (2011–2015), likely reflecting a slight rebound in Chinook salmon numbers and a slight increase in fishing opportunity as a result. However, this amounted to 67% of the most recent 10-year average of 32,294 fish and only 52% of the historical average (1976–2015) of 41,709 fish. This pattern of reduced harvests does not indicate a reduced need by fishing households; declines in harvest have occurred in response to conservative management actions based on low abundance. Additionally, some Yukon River communities and individual households have voluntarily reduced their Chinook harvests to aid in rebuilding the run. Chinook salmon subsistence harvests have not fallen within the amounts necessary for subsistence (ANS) range for the last 9 years (Table 4-6).

Summer chum salmon harvests in 2016 were slightly below the last 5- and 10-year averages (87% and 91% respectively). Conservation measures to protect Chinook salmon likely had an effect on the harvest of summer chum salmon, since the two species co-migrate. The 2016 summer chum harvest was approximately 61% of the historical average harvest of 145,408. Since 1996, when the market for chum salmon roe declined, so have subsistence summer chum salmon harvests. 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. Since the roe fishery ended, summer chum salmon harvests have been relatively stable. Although summer chum salmon harvests have not increased, they may nevertheless play a more pronounced role in terms of the portion of total salmon put up for food as subsistence users attempt to adapt to changes in Chinook salmon availability. Summer chum salmon harvests remained within the ANS range for the seventh year in a row (Table 4-6). Since 2005, summer chum salmon harvests have only fallen below the ANS range one year (2009).

In 2016, fall chum salmon harvests were at 90% of their 5-year average harvest and 96% of their 10-year average. Compared to the average historical harvest (since 1976), 2016 harvests were at approximately 76%. As with summer chum salmon, steep declines in fall chum salmon harvests were seen after the closure of the roe fishery but are also likely tied to a decline in the number of dog teams along the Yukon River (Figure 4-3). Fall chum salmon are used as both human food and dog food, especially in the upper river districts where they are the only other abundant salmon species besides Chinook salmon. Fall chum salmon harvest fell below the lower bound of the ANS range for the second year in a row (Table 4-6). Since 1998, fall chum salmon harvests have only been within the ANS range 5 out of 19 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 salmon harvest.

The 2016 subsistence harvest of coho salmon of 8,822 fish was the second lowest harvest on record. Harvests amounted to approximately half that of the 5-year and 10-year average harvests, and only 35%

of the historical average (since 1976). Due to run timing, the management of coho salmon is tied to the management of fall chum salmon. As such, it is difficult to assess actual reasons for trends in coho salmon harvests over time, especially considering they are not specifically targeted by a large number of fishing households for subsistence due to their lower abundance compared to other species. Coho salmon harvests were below the minimum bound of the ANS in 2016 and have only fallen within the range 6 of the 19 years for which ANS has been in place (Table 4-6).

Pink salmon harvests are typically only reported in lower river communities, although the species is included on harvest surveys and catch calendars in all regions of the drainage[7]. 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. A larger than average harvest of pink salmon occurred in 2016; it was more than double of the last 5- and 10-year averages. Although sockeye salmon are occasionally found in the lower portion of the Yukon River, their numbers are so low that they are not included in harvest reporting. An ANS range for pink salmon on the Yukon River was first established in 2013. Harvests have fallen within the range from 2014–2016.

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 5,375 dogs owned by Yukon Area households in 2016, upper Yukon River households in districts 4, 5, and 6 owned 3,359 dogs (62% of the total number of dogs owned in Yukon River districts). Of the estimated 1,940 households in the Yukon Area that own dogs, about 15% (281 households) fed whole salmon to their dogs in 2016 (Padilla et al. *In prep*). Most households that own dogs feed them fish scraps but do not harvest salmon to feed to dogs. In 2016, the Division of Commercial Fisheries collected information on the number of four 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 surveyed communities along the Yukon River, an estimated 9,243 summer chum salmon, 36,296 fall chum salmon, and 1,027 coho salmon were retained for dog food from subsistence salmon harvests. Additionally, permit holders in districts 5 and 6 fed 22,815 whole salmon to dogs (Padilla et al. *In prep*).

Figure 4-5 shows the primary gear types used by Yukon Area fishing households in 2016. Drift gillnets were utilized by 50% of households, while 44% used set gillnets and 6% used fish wheels. The gear types used for salmon fishing vary by region, in part due to differing regulations and river conditions throughout the drainage.

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. Since 2014, the Division of Commercial Fisheries has no longer reported data on whether households met their subsistence needs. Historical needs-met data can be found in prior issues of this report. However, continued drainagewide Chinook salmon harvests well below ANS likely indicate that subsistence needs are still not being met. See Table 4-6 for a comparison of ANS ranges and subsistence salmon harvests by species from 1998–2016.

7. Pink salmon harvests on the Yukon River have been estimated only since 2000, compared to 1976 for other salmon species.

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 seven days per week, 24 hours per day, year-round. These state regulations also apply to subsistence fisheries in waters adjacent to federal lands (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.[8]

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 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 estimates harvests of whitefish, sheefish, and northern pike by surveyed community[9]. The "large whitefish" category includes broad and humpback whitefishes while the "small whitefish" category includes least and Bering cisco species and round whitefish. In 2016, Yukon Area fishers harvested a total of 108,625 of these nonsalmon fish. This represents a slight decrease over the two previous years when the harvest of nonsalmon fish was 122,324 (2014) and 112,677 (2015) fish (Fall et al 2017, 2018). However, the 2016 harvest was greater than the 2010-2013 harvests of nonsalmon fish which amounted to an average of 85,109 fish during those years (Fall et al 2013a, 2013b, 2014, 2015).

The total nonsalmon fish harvest comprised 35,777 large whitefish (33% of the total), 33,769 small whitefish (31%), 24,605 northern pike (23%), and 14,474 sheefish (13%). The majority of nonsalmon fishes are harvested in the lower river; 81% of the total harvest in 2016 occurred in the Coastal District through District 3. However, harvest distribution throughout the drainage varies by species. Roughly comparable amounts of large whitefish are harvested between the lower and upper river districts (18,874 fish and 16,903 fish respectively). In 2016, fishers in District 5 harvested more large whitefish than any other district (31% of the total). District 1 fishers harvested the largest numbers of small whitefish (15,867 fish or 47% of the total). All in all, 80% of the total small whitefish were harvested in the lower river. Similarly, 82% of northern pike were harvested in the lower river. District 2 fishers harvested the most northern pike (10,108 fish or 41% of the total). Sheefish harvests were distributed 63% in the lower river versus 37% in the upper river. District 1 fishers harvests the most sheefish. These patterns in whitefish harvest by species category can be attributed to species abundance and migration patterns, as well as the fishing profiles of each region.

8. 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.
9. Nonsalmon fish harvest data is not reported using the same categories on permits and is therefore not included here.

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 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). In 2015 and 2016, the division administered household surveys and key respondent interviews in six lower Yukon River communities that documented subsistence nonsalmon harvests and uses (Runfola et al. 2018). 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[10].

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 19 Yukon River communities since 2010[11] (Brown et al. 2015; 2016; Holen et al. 2012; Ikuta et al. 2014; 2016; Wilson and Kostick 2016). In all communities, salmon was a primary subsistence resource, accounting for an average of 50% 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 2, and Shageluk, in District 3, 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 2016. Communities throughout the Yukon River drainage continued to experience extremely low Chinook salmon harvests in 2016. While the 2016 harvest of Chinook salmon was a great improvement over the three previous years of record low harvests, it was still significantly lower than historical averages. This year's harvest equated to only 52% of the historical average, based on harvest data from 1976 to 2015 (41,709 Chinook salmon). Ethnographic data gathered during various Division of Subsistence research projects in Yukon River communities has shown that these decreases in Chinook salmon harvests on the Yukon River are not reflective of a change in social or cultural significance, dietary preferences, or interest in Chinook salmon fishing. Instead, the reduction in harvest has generally been considered a sacrifice to support future production and recovery that should not be understated. Although harvests did improve in 2016, they are still well below historical averages and the needs of subsistence users along the river.

10. https://www.adfg.alaska.gov/sb/CSIS/
11. Additional comprehensive subsistence surveys were completed in communities along the Tanana River drainage, but they have not been included here because it is common for salmon harvests from those communities to take place in other river systems.

Table 4-1.–Yukon Area fishing schedule, 2016.

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, 2016.

Community	Permits Issued	Permits Returned	Percent returned	Number of permits returned that fished
Subsistence permits				
Central	5	5	100%	4
Circle	19	19	100%	10
Eagle	28	28	100%	23
Rampart	4	4	100%	4
Fairbanks (FNSB)[a]	341	337	99%	208
Manley	14	13	93%	9
Minto	19	17	89%	5
Nenana[e]	39	36	92%	18
Stevens Village	0	0	0%	0
Upper Tanana Villages[b]	19	19	100%	11
Other Subsistence[c]	25	25	100%	18
Subsistence permit subtotal	**513**	**503**	**98%**	**310**
Personal use permits				
Fairbanks (FNSB)[a]	15	15	100%	7
Other personal use[d]	6	6	100%	3
Personal use permit subtota	**21**	**21**	**100%**	**10**
Total	**534**	**524**	**98%**	**320**

Source Estensen et al. (2018)

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, 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.

e. Includes the community of Healy.

Table 4-3.–Estimated number of subsistence fishing households in surveyed communities, with community and district totals, Yukon Area, 2016.

Community	Households		Estimated number of fishing households
	Total	Surveyed	
Hooper Bay	218	97	86
Scammon Bay	118	58	86
Coastal District subtotal	**336**	**155**	**172**
Alakanuk	145	69	76
Emmonak	192	106	82
Kotlik	115	53	90
Nunam Iqua	40	25	28
District 1 subtotal	**492**	**253**	**276**
Marshall	98	53	59
Mountain Village	168	68	94
Pilot Station	125	63	50
Pitkas Point	30	23	16
St. Marys	135	66	95
District 2 subtotal	**556**	**273**	**314**
Holy Cross	62	37	40
Russian Mission	77	30	43
Shageluk	25	17	5
District 3 subtotal	**164**	**84**	**88**
Alatna	7	5	2
Allakaket	59	21	14
Anvik	34	27	18
Bettles	27	14	3
Galena	143	49	76
Grayling	54	22	20
Hughes	36	27	11
Huslia	86	32	19
Kaltag	52	21	28
Koyukuk	44	20	22
Nulato	76	29	57
Ruby	60	23	21
District 4 subtotal	**678**	**290**	**291**
Beaver	210	83	14
Birch Creek	29	21	0
Chalkyitsik	461	216	10
Fort Yukon	74	33	60
Stevens Village	12	9	4
Tanana	11	7	51
Venetie	32	17	26
District 5 subtotal	**829**	**386**	**165**
Total	**3,055**	**1,441**	**1,306**

Source Estensen et al. (2018)

Table 4-4.–Estimated subsistence salmon harvests by community, Yukon Area, 2016.

Community	Households or permits: Total	Households or permits: Surveyed or returned	Estimated salmon harvest[a]: Chinook	Coho	Summer chum	Fall chum	Pink	Total
Hooper Bay	218	97	284	121	6,324	105	4,007	10,841
Scammon Bay	118	58	602	234	5,520	657	2,490	9,503
Coastal District subtotal	**336**	**155**	**886**	**355**	**11,844**	**762**	**6,497**	**20,344**
Alakanuk	145	69	465	183	6,527	743	713	8,631
Emmonak	192	106	939	717	8,976	2,501	228	13,361
Kotlik	115	53	1,172	278	9,105	1,247	513	12,315
Nunam Iqua (Sheldon Point)	40	25	190	58	2,130	111	352	2,841
District 1 subtotal	**492**	**253**	**2,766**	**1,236**	**26,738**	**4,602**	**1,806**	**37,148**
Marshall	98	53	512	409	5,180	1,106	5	7,212
Mountain Village	168	68	809	438	8,782	1,204	89	11,322
Pilot Station	125	63	652	136	4,796	903	8	6,495
Pitkas Point	30	23	156	22	1,485	232	48	1,943
St. Marys	135	66	1,032	128	7,379	1,088	104	9,731
District 2 subtotal	**556**	**273**	**3,161**	**1,133**	**27,622**	**4,533**	**254**	**36,703**
Holy Cross	62	37	557	134	991	583	2	2,267
Russian Mission	77	30	321	6	1,798	235	0	2,360
Shageluk	25	17	23	0	275	179	9	486
District 3 subtotal	**164**	**84**	**901**	**140**	**3,064**	**997**	**11**	**5,113**
Alatna	7	5	1	0	652	0	0	653
Allakaket	59	21	45	33	2,350	551	0	2,979
Anvik	34	27	241	184	1,117	527	0	2,069
Bettles	27	14	0	0	13	0	0	13
Galena	143	49	993	201	1,689	3,319	11	6,213
Grayling	54	22	370	35	878	499	33	1,815
Hughes	36	27	17	0	1,196	621	0	1,834
Huslia	86	32	77	93	3,568	333	0	4,071
Kaltag	52	21	1,358	53	467	680	73	2,631
Koyukuk	44	20	612	1	119	297	0	1,029
Nulato	76	29	1,957	0	1,001	2,681	0	5,639
Ruby	60	23	344	226	678	526	0	1,774
District 4 subtotal	**678**	**290**	**6,015**	**826**	**13,728**	**10,034**	**117**	**30,720**
Beaver	210	83	165	0	23	228	0	416
Birch Creek	29	21	0	0	0	0	0	0
Central	5	5	53	0	0	18	0	71
Chalkyitsik	461	216	50	30	0	550	0	630
Circle	19	19	207	38	0	1,288	0	1,533
Eagle	28	28	864	0	0	15,765	0	16,629

-continued-

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
Fairbanks	356	352	1,461	1,345	670	3,310	0	6,786
Fort Yukon	74	33	1,226	1	12	7,737	0	8,976
Rampart	4	4	50	2	129	0	0	181
Stevens Village	12	9	178	50	500	4,500	0	5,228
Tanana	11	7	2,129	639	3,685	21,261	34	27,748
Venetie	32	17	536	0	0	5,333	0	5,869
District 5 subtotal	**1,241**	**794**	**6,919**	**2,105**	**5,019**	**59,990**	**34**	**74,067**
Manley	14	13	230	323	32	414	0	999
Minto	19	17	35	0	4	40	0	79
Nenana	39	36	464	2,970	19	3,544	0	6,997
District 6 subtotal	**154**	**151**	**894**	**6,474**	**884**	**12,619**	**0**	**20,871**
Other communities	50	50	307	0	188	17	0	512
Total	**3,589**	**1,965**	**21,684**	**9,088**	**88,258**	**84,933**	**8,719**	**212,682**

Source Estensen et al. (2018)

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, 1976–2016.

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	1,607	12,575	14,566	115,252	113,767	1,079	257,239
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
2016	3,589	1,965	21,684	9,088	88,258	84,933	8,719	212,682

-continued-

Table 4-5.–Page 2 of 2.

Year	Households or permits[a]		Estimated salmon harvest[a]					
	Total	Surveyed or returned	Chinook	Coho	Summer chum	Fall chum	Pink	Total
5-year average (2011–2015)	3,151	1,605	19,000	16,820	101,989	94,644	3,619	236,073
10-year average (2006–2015)	3,036	1,583	32,294	17,319	97,457	88,425	4,110	239,604
Historical average (1976–2015)	2,887	1,421	41,709	25,974	145,408	111,489	4,157	318,972

Source Estensen et al. (2018)

a. Estimates prior to 1988 are based on fish camp surveys and sampling information is unavailable.

Note 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, 1998–2016.

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	**7,577**	**18,107**	83,567	**86,600**	2,645
2016	**21,627**	**8,822**	88,082	**84,650**	8,719

Source Estensen et al. (2018)

a. Estimates for 1998–2004 do not include personal use harvests, ADF&G test fishery distributions, or salmon removed from commercial harvests. Estimates for 2005–2016 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, 2016.

Community	Households		Estimated nonsalmon harvest				
	Total	Surveyed[a]	Large whitefish[b]	Small whitefish	Northern pike	Sheefish	Total
Hooper Bay	218	97	846	3,602	1,137	36	5,621
Scammon Bay	118	58	955	1,569	4,129	740	7,393
Coastal District subtotal	**336**	**155**	**1,801**	**5,171**	**5,266**	**776**	**13,014**
Nunam Iqua (Sheldon Point)	145	69	382	954	25	362	1,723
Alakanuk	192	106	2,346	4,641	725	1,914	9,626
Emmonak	115	53	1,217	4,669	1,063	1,506	8,455
Kotlik	40	25	2,557	5,603	1,754	1,796	11,710
District 1 subtotal	**492**	**253**	**6,502**	**15,867**	**3,567**	**5,578**	**31,514**
Mountain Village	98	53	3,267	4,939	3,041	745	11,992
Pitkas Point	168	68	1,554	237	516	153	2,460
St. Marys	125	63	2,549	72	1,886	813	5,320
Pilot Station	30	23	674	165	185	307	1,331
Marshall	135	66	1,063	392	4,480	392	6,327
District 2 subtotal	**556**	**273**	**9,107**	**5,805**	**10,108**	**2,410**	**27,430**
Russian Mission	62	37	686	127	928	178	1,919
Holy Cross	77	30	710	7	147	133	997
Shageluk	25	17	68	41	83	109	301
District 3 subtotal	**164**	**84**	**1,464**	**175**	**1,158**	**420**	**3,217**
Anvik	7	5	259	0	118	66	443
Grayling	59	21	173	0	53	84	310
Kaltag	34	27	326	14	0	172	512
Nulato	27	14	66	4	27	368	465
Koyukuk	143	49	65	0	25	66	156
Galena	54	22	429	201	129	353	1,112
Ruby	36	27	356	0	8	19	383

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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
Huslia	86	32	995	110	1,235	188	2,528
Hughes	52	21	2,855	1,397	15	97	4,364
Allakaket	44	20	421	365	356	213	1,355
Alatna	76	29	24	345	52	13	434
Bettles	60	23	0	0	6	0	6
District 4 subtotal	**678**	**290**	**5,969**	**2,436**	**2,024**	**1,639**	**12,068**
Tanana	210	83	9,280	2,759	452	3,393	15,884
Stevens Village	29	21	20	0	14	0	34
Birch Creek	461	216	79	0	96	12	187
Beaver	74	33	8	42	41	11	102
Fort Yukon	12	9	658	1,514	794	186	3,152
Venetie	11	7	51	0	79	16	146
Chalkyitsik	32	17	838	0	1,006	33	1,877
District 5 subtotal	**829**	**386**	**10,934**	**4,315**	**2,482**	**3,651**	**21,382**
Total	**3,055**	**1,441**	**35,777**	**33,769**	**24,605**	**14,474**	**108,625**

Source Estensen et al. (2018)

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.

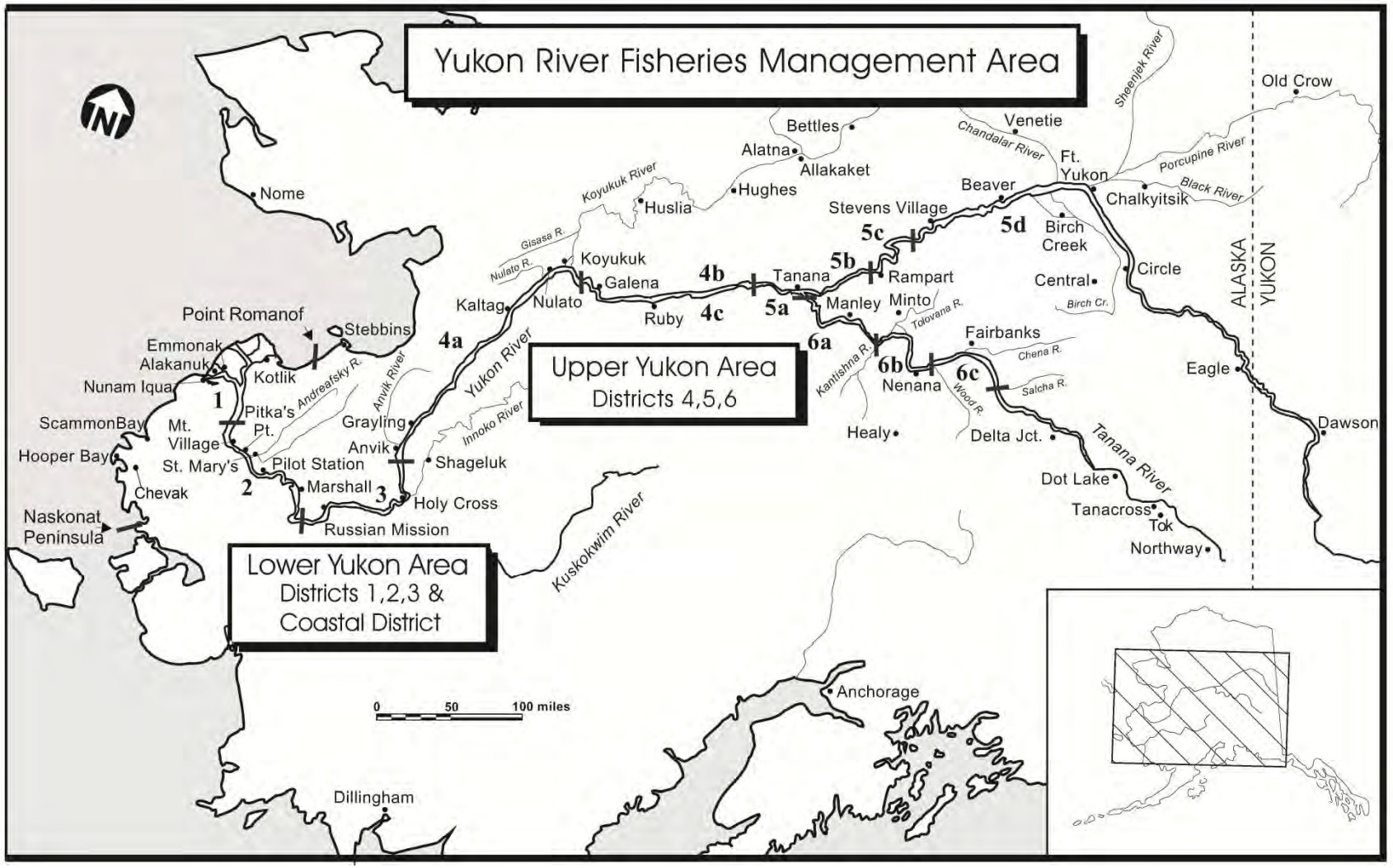

Figure 4-1.–Map of the Alaska portion of the Yukon River drainage, showing communities and districts..

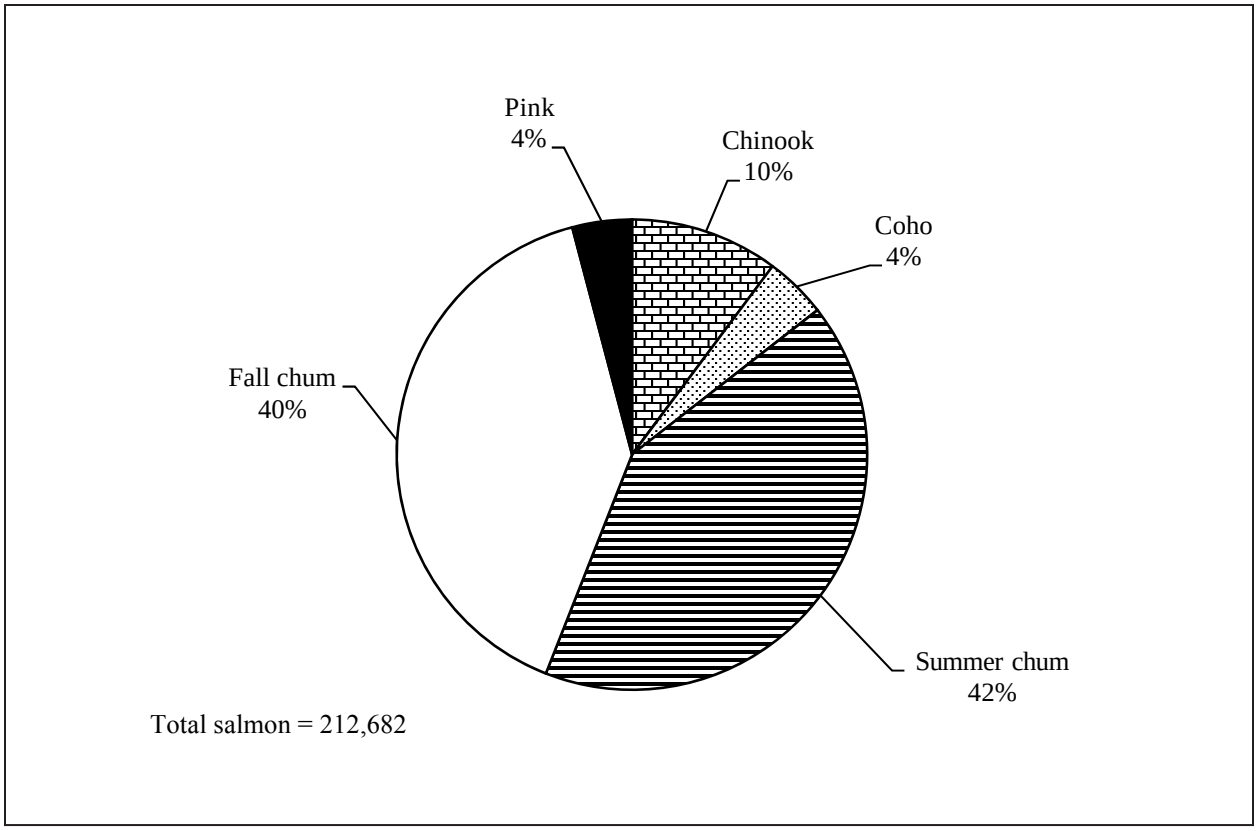

Figure 4-2.–Yukon Area estimated subsistence salmon harvests, 2016.

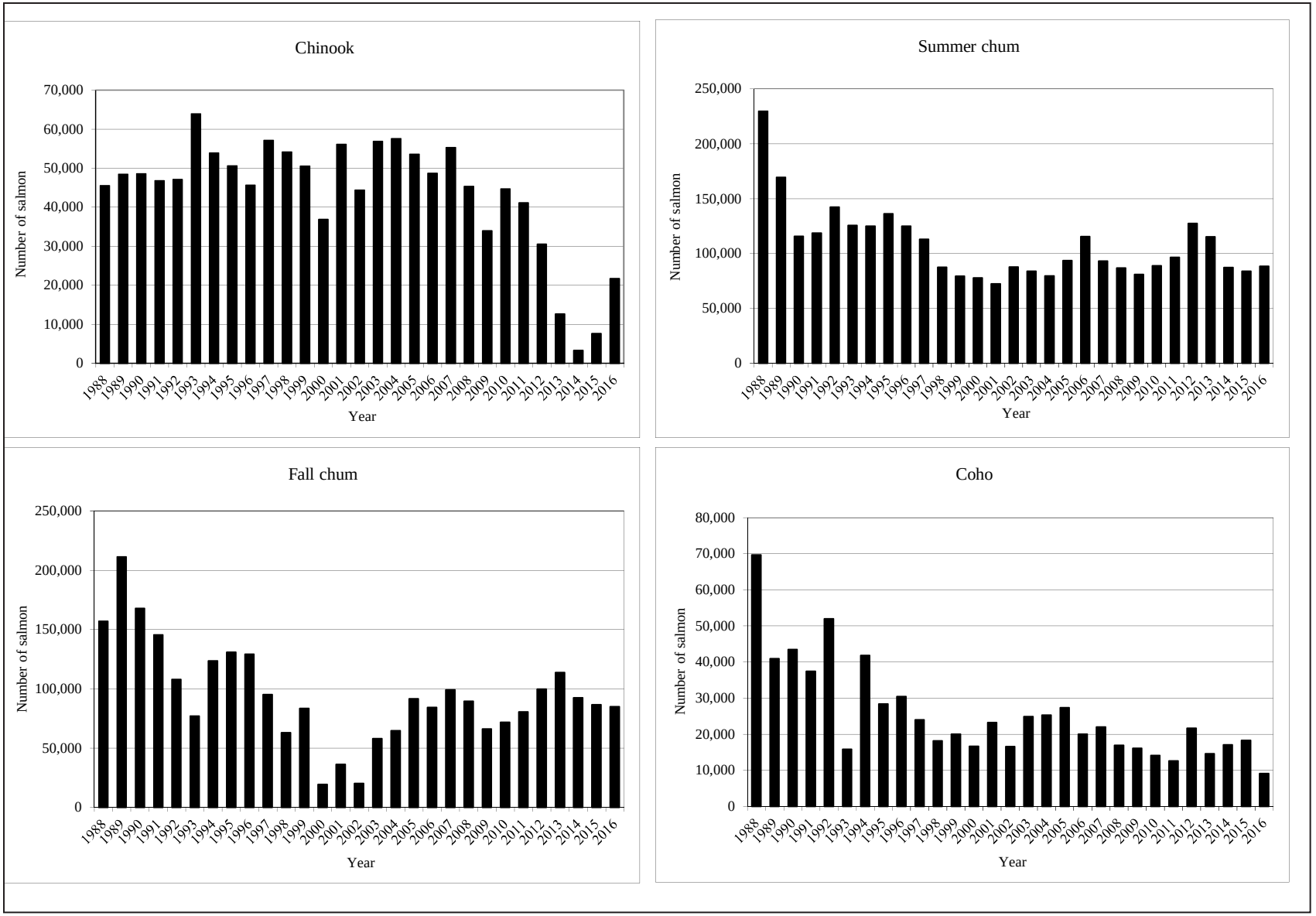

Figure 4-3.–Estimated subsistence salmon harvests by species, Yukon Area, 1988–2016.

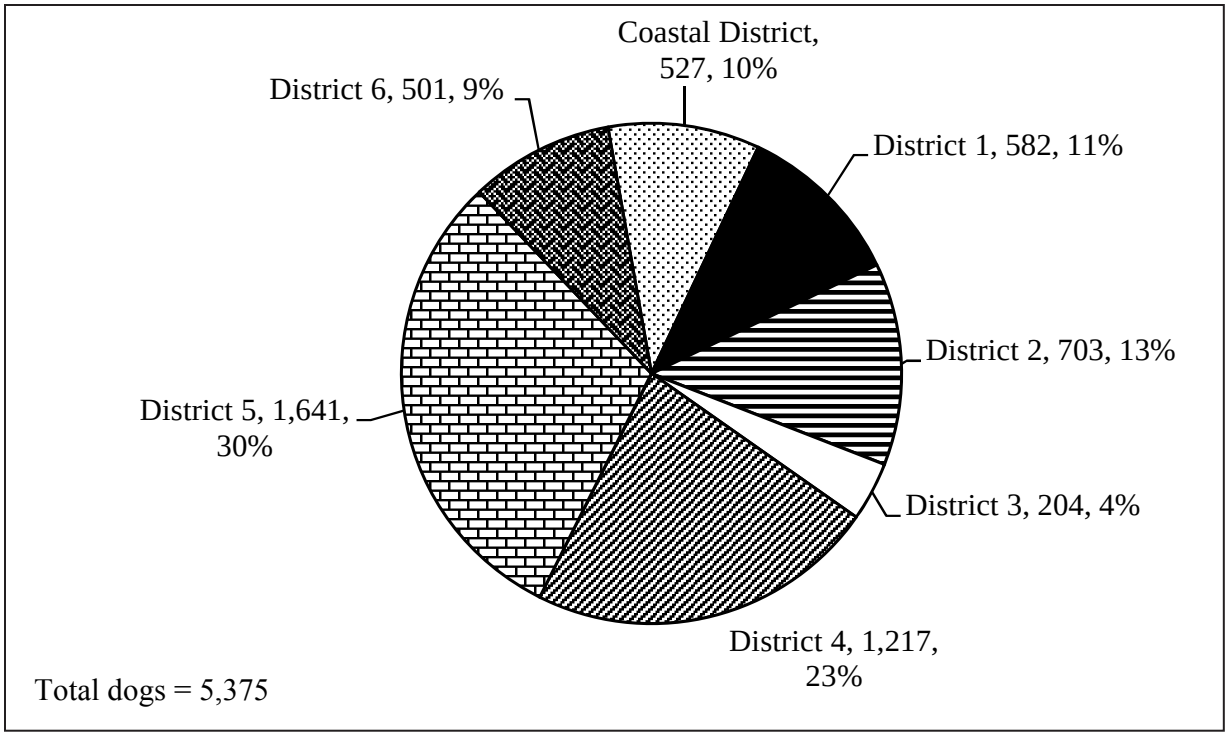

Figure 4-4.–Estimated number of dogs by district, Yukon Area, 2016.

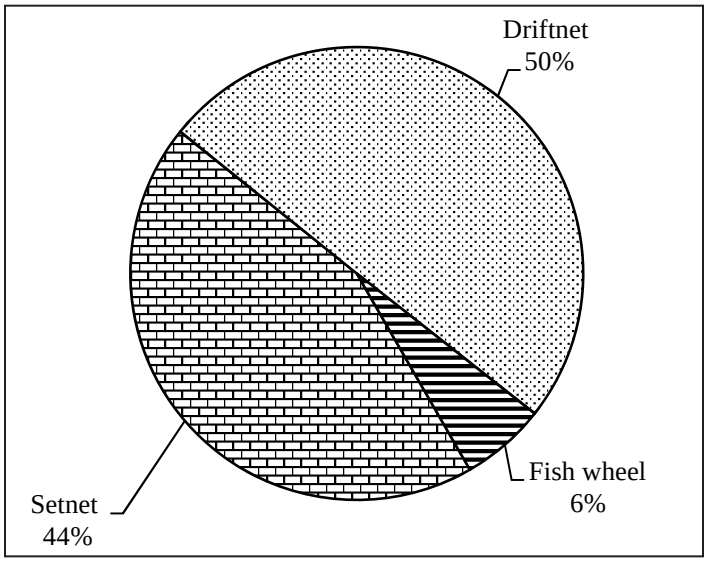

Figure 4-5.–Primary gear type utilized for subsistence salmon fishing, Yukon Area, 2016.

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). From 1994, when the Alaska Department of Fish and Game (ADF&G) began acquiring reasonably complete statewide coverage of subsistence harvest survey data, through 2013, over 50% of Chinook salmon harvested under subsistence regulations were taken in the Kuskokwim Management Area (KMA), mostly in the Kuskokwim River drainage. In 2016, an estimated 36,268 Chinook salmon from the Kuskokwim Area represented about 43% of the Chinook salmon subsistence harvest statewide (about 84,835 fish; Table 2-1). 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 five 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; important economic opportunities for commercial sales of salmon were severely limited in 2016 because, for the first time since statehood, there was no large scale buyer/processor operating in the area (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; 1963b; 1990; Pete 1993; Poetter and Tiernan 2017:3; 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 resumed 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, 28 of which are surveyed each year on a voluntary basis. In 2016, there were approximately 4,163 households in 30 communities, excluding eight communities that do not consistently participate in the surveys (Table 5-1).[1]

Bethel is the largest community in the region, consisting of approximately 1,913 households in 2016. 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

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 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 2016, and Telida is no longer considered a year-round community (Shelden et al. 2016).

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 has usually participated in the voluntary ADF&G harvest survey but has not been successfully visited often or consistently enough in recent years to provide a useful estimate via this method and was therefore not estimated in 2016; Kwigillingok and Kipnuk had often participated but have not since 2004, the most recent year in which all three 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; 2012b). 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 seven 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 in the *McDowell* case, 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; goals for KMA and other Arctic–Yukon–Kuskokwim (AYK) salmon stocks were reevaluated in 2015 (Conitz et al. 2015)[3]. 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; such a system was implemented in 2015; however, no permit system was implemented in 2016 (Poetter and Tiernan 2017).

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

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.
3. "Kuskokwim Area revisions were recommended for Kanektok River Chinook, Kanektok River sockeye *O. nerka*, and North Fork Goodnews River sockeye salmon goals. Discontinuation of the Aniak River chum salmon goal was recommended because the sonar assessment project was discontinued. No other changes to the region's escapement goals were recommended" (Conitz et al. 2015:1)

plan or otherwise ordered for conservation purposes, as has been the case in recent years. 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 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 two 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.

Therefore, until the recent sharp decline in Chinook salmon, the subsistence salmon fishing season in the Kuskokwim Area was generally open unless a subsistence fishing schedule closure was implemented by emergency order prior to, during, and after commercial fishing periods, or closures to the fishery were 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. In recent years, a gillnet fishing closure has occurred by emergency order early in the season with timed openings announced during the Chinook salmon run; this limits fishing for these highly desired fish as well as other species.

Subsistence Fishery

As in 2014 and 2015, the department's preliminary management strategy for the 2016 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. Several regulations adopted by the BOF in 2014 and 2015 are intended to reduce overall Chinook salmon harvests while allowing for some subsistence salmon fishing opportunity during times of Chinook salmon conservation; the regulations focus on gear that is either nonlethal or nonselective for Chinook salmon and stipulate the live release of Chinook salmon to the water. These regulations enable the department to allow and regulate the use of dip nets, fish wheels, and 4-inch mesh set gillnets (Poetter et al. 2016:7) and were in effect for the 2016 fishing season (Poetter and Tiernan 2017:8).

In January of 2016, the BOF adopted language that annually suspends directed subsistence fishing for Chinook salmon in the Kuskokwim River until after June 11 in order to ensure that Chinook salmon reach the middle and upper Kuskokwim River for escapement and subsistence uses. Also at that meeting, beach seines (3.5-inch or less mesh) were added to nonlethal gear alternatives for use during Chinook salmon conservation and closure (Poetter and Tiernan 2017:7). Two proposals related to permit systems were tabled to allow additional discussion; no subsistence permit system was implemented in 2016.

In 2016, as in 2014 and 2015, an early season fishing closure was initiated. Subsistence fishing was closed in the Kuskokwim River mainstem from its mouth at Kuskokwim Bay to the Holitna River and within salmon bearing tributaries[4] on May 20, and upstream of the Holitna River beginning June 1. Subsistence fishing was immediately reopened with restrictions to the nonlethal and nonselective gear. On June 1, for the third consecutive year, the Federal Subsistence Board (FSB) initiated a Federal Special Action to manage the Chinook salmon fishery within the boundaries of the YDNWR. For the second consecutive year, an FSB special action allowed only federally qualified subsistence users (residents of the Kuskokwim River drainage and the villages of Chefornak, Kipnuk, Kwigillingok, and Kongiganak) to fish for salmon within the boundaries of the refuge (Poetter and Tiernan 2017:31).

Opportunities to fish for Kuskokwim River salmon in 2016 were substantially different in federal waters (below Aniak) from state waters (above Aniak); however, fishing in both jurisdictions began on June 12.

4. The Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak river drainages are major spawning streams for Chinook salmon and were closed throughout the 2016 Chinook salmon run.

In state waters from the Holitna River to the Kuskokwim River headwaters, ADF&G opened subsistence fishing indefinitely beginning June 12, with nets restricted to 6-inch or less mesh size and 25 fathoms or less in length. In state waters between Aniak and the Holitna River, ADF&G provided one subsistence gillnet opportunity (48 hours beginning June 12, restricted to 6-inch or less mesh size and 25 fathoms or less in length) prior to opening that central portion of the river with the same net restrictions indefinitely on June 16, except for the Aniak River gillnet closure, which remained in effect.

In federal waters of the YDNWR, four subsistence gillnet fishing opportunities were provided during the Chinook salmon conservation closure, all opening at 12:01 pm: 12 hours on June 12, 24 hours beginning June 16, 72 hours beginning June 21, and 72 hours beginning June 29 (Staton and Coggins 2016).

On July 7, 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]

During the 2016 season, ADF&G stock assessment projects affirmed the preseason expectation that Chinook salmon returns appeared to be of below-average abundance. In order to reduce harvest of these stocks, the initiation of commercial salmon fishing was delayed until the Chinook salmon run had passed through District 1—such that no commercial opening to target chum or sockeye salmon was provided. Because the 2016 season marked the first time since statehood that there were no large scale commercial salmon buyer/processors in the KMA, only two commercial openings to target coho salmon were provided, July 29 and August 12 (Poetter and Tiernan 2017:8). Subsistence salmon fishing was closed by emergency order six hours before, during, and three hours after commercial fishing periods.

Based upon analysis of the department's Chinook Salmon Run Reconstruction Model, the total run of Kuskokwim River Chinook salmon in 2016 was estimated to be 176,916 fish (95% CI: 134,407–232,871 fish) (Liller 2017:1). Chinook salmon abundance in the Kuskokwim River drainage has decreased since 2007, with some improvement since the record low year of 2013 (Liller 2017:17). "The total run of Chinook salmon in 2016 was the largest since 2009, but considerably less than long-term average abundance. Total escapement was near average due to conservative management and harvest restrictions throughout the run. The drainagewide sustainable escapement goal of 65,000–120,000 was probably exceeded in 2016" (Liller 2017:1). The 2016 estimated total KMA Chinook salmon subsistence harvest of 36,268 fish (Table 5-1) was fourth smallest estimated harvest on record, about 43% of the long term average annual Chinook salmon subsistence harvest of 84,000 fish (Poetter and Tiernan 2017:39).

Subsistence Salmon Harvest Assessment Methods

Inseason Fisher Harvest and Effort Surveys

In May of 2016, USFWS and the Kuskokwim River Intertribal Fish Commission (KRITFC) entered into formal partnership for fisheries management with the U. S. Department of the Interior (DOI) and USFWS, *Kuskokwim River Partnership Memorandum of Understanding*.[6,7] Together with the Orutsararmiut Native Council (ONC) of Bethel, these entities implemented a harvest and effort assessment project to produce inseason subsistence salmon harvest estimates and to increase managerial understanding of the fishery's behavior in the YDNWR of the Kuskokwim River (Staton and Coggins 2016). In its pilot year (2016), the project focused on collecting information from fishers as they returned to the Bethel boat harbor and at area fish camps during fishing openings. The project also conducted survey flights to count the number of drift

5. Gillnet mesh size was restricted to 6-inch or less and length to 25 fathoms or less.
6. Native Village of Napaimute, 2016, "May 11, 2016 Historic Memorandum of Understanding Signed Between the Kuskokwim Inter-Tribal Fish Commission, the United States Department of the Interior–US Fish and Wildlife Service Alaska Region to Formalize Kuskokwim Fisheries Management Partnership." Accessed September 13, 2018. http://napaimute.org/2016/05/18/may-11-2016-historic-memorandum-of-understanding-signed-between-the-kuskokwim-inter-tribal-fish-commission-the-united-states-department-of-the-interior-us-fish-and-wildlife-service-alaska-region-t/
7. Charles Enoch, 2016, "KRITFC Signs an MOU With USFWS." Accessed September 13, 2018. http://www.kyuk.org/post/kritfc-signs-mou-usfws

boats and setnets fishing within the YDNWR boundaries; these data were used to estimate the total number of fishing trips each day (Staton and Coggins 2016:3). Although sampling bias is a complex problem, the USFWS/KRITFC harvest and effort assessment project represented the first attempt to provide real-time information to the inseason management team as the season progressed in terms of time spent and fishing results. Assumptions made regarding the effort and success of fishers from other communities versus most respondents (from Bethel), as well as the nonrandom sampling of Bethel fishers, led to substantial uncertainty in the derived harvest estimates that left room for improvement to be pursued (Staton and Coggins 2016:9).

The resulting total estimate of 80,443 salmon harvested within refuge boundaries during the four openings (Staton and Coggins 2016) is inevitably incomplete because some fishing for chum salmon, much fishing for sockeye salmon, and all fishing for coho salmon took place after the Chinook salmon conservation closure (within which the openings occurred). Therefore, comparisons to postseason data presented in Table 5-1 (Lower Kuskokwim row) are speculative. However, if we assume that YDNWR communities caught 100% of the Chinook salmon, 90% of the chum salmon, and 50% of the sockeye salmon estimated by the postseason harvest during the openings, the comparison is quite strong (26,340 Chinook + 34,739 chum + 19,848 sockeye = 80,927 salmon), and the value of rigorous inseason data collection was supported.

Postseason Household Harvest Surveys

ADF&G has been estimating Kuskokwim Area subsistence salmon harvests annually by postseason subsistence 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; 2012b). The purpose of the survey is to collect data about the number and species of salmon harvested by area residents.

Under a cooperative program between ADF&G and the USFWS Office of Subsistence Management, postseason 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. Postseason subsistence harvest data collection in all other communities was conducted by ADF&G staff in 2016.

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 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).

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 one of 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 household classification was expanded into five strata based on a household's most recent two known years of participation within the past five years in the subsistence fishery.

An attempt was made to census the two highest harvest strata groups, and the stratum group for which no past harvest level could be determined. The remaining two 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*.[8]

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 (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 Kuskokwim Area Community Subsistence Salmon Harvests

For the remaining communities in the Kuskokwim Area, subsistence harvest data were collected by 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. Some community leaders requested that the surveys not take place in their communities, and household participation in the surveys was voluntary.

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 five sampling strata accordingly (Shelden et al. 2014:8). Calendar data are not provided in this report.

8. 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.

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 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 five strata groups to give a community harvest estimate. Communities where harvest survey data were inadequate or unavailable, for 2016 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).

2016 Sampling Summary

In 2016, the estimated total number of households in communities normally surveyed in the Kuskokwim Area was 4,163. This number includes households in 2 of the 11 communities retained in the database as usual participants, although neither participated in 2016 and had not participated frequently enough in recent years for an estimate to be calculated (Kongiganak and Telida)[9], but does not include Kipnuk and Kwigillingok households in north Kuskokwim Bay (together 235 households 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 4,163 estimated households, 76% were located in the Lower Kuskokwim region, including 1,913 households (46% of the total estimated households) in Bethel and 1,248 households (30%) in the remainder of Lower Kuskokwim communities, followed by 355 households in Middle Kuskokwim, and 290 households in Upper Kuskokwim (Table 5-1).

Out of the 4,163 households in communities normally surveyed, surveys were conducted with 1,820 households within 28 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, 1,220 (39%) of the 3,161 households were contacted. In the south Kuskokwim Bay region (Quinhagak, Goodnews Bay, and Platinum), 146 (55%) of the 267 households were contacted. None of the Bering Sea coastal communities were surveyed in 2016, 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 16% (645 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, 268 (76%) of 355 households were contacted in 2016. For upper Kuskokwim communities, defined here as communities located on the Kuskokwim River from Crooked Creek upriver to Telida (in addition to Lime Village located on the Stony River and Takotna located on the Takotna River), 186 (64%) of 290 households were contacted. Telida was not surveyed in 2016. The

9. The village of Kongiganak in the north Kuskokwim Bay declined a request by ADF&G staff to conduct surveys in 2012–2016, and the village of Telida appears to be a seasonally occupied location with no year-round residents.

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 two communities; the large majority of Georgetown and Napaimute community members are surveyed during their residence in other Kuskokwim River communities.

2016 Subsistence Salmon Harvest Summary

A summary of the subsistence salmon harvest estimates by community and fishing area is presented in Table 5-1. In 2016, fishers harvested an estimated total of 180,836 salmon for subsistence use from the Kuskokwim Area; about 168,321 of the salmon were harvested from the Kuskokwim River (93%). People in the Lower Kuskokwim communities harvested about 133,632 salmon, 74% of the estimated total subsistence salmon harvest, including 58,051 salmon (32%) in Bethel and 75,581 salmon (42%) in the remaining Lower Kuskokwim communities (Table 5-1). Fishers in the Middle Kuskokwim communities harvested 26,696 fish (15%), followed by 12,515 fish (6%) in South Kuskokwim Bay, and 7,993 fish (4%) in the Upper Kuskokwim.

Sockeye salmon contributed 30% of the estimated subsistence salmon harvest (54,627 fish), followed by chum salmon (25%, 46,026 fish), coho salmon (22%, 39,388 fish), Chinook salmon (20%, 36,268), and pink salmon (3%, 4,527 fish) (Table 5-1 and Figure 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, seven 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 seven 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%).

In 2016, the subsistence harvests of all salmon species except chum salmon were higher than the most recent 5-year average (2011–2015; Table 5-3); pink salmon harvests were more than double the 5-year average, and the total catch was similar to the recent 5-year average. Chum salmon harvests show the only consistent decline: harvests in 2016 were 25% below the most recent 5-year average, about 28% below the 10-year and 15-year averages, and 39% below the historical average. The 2016 subsistence harvests of Chinook salmon (36,268 fish) were about 3% higher than the recent 5-year average harvest of 35,356 fish but 42% below the 10-year average (62,120 fish), 48% below the 15-year average (70,057 fish), and 55% below the historical average (79,711 fish). Subsistence sockeye salmon harvests in 2016 were 17%–20% higher than any of the recent averages, and 21% higher than the historical average of 45,047 fish. The 2016 subsistence harvests of coho and pink salmon were higher than any of the averages, except the coho salmon harvest was less than 2% below the historical average (40,303 fish).

Key respondents contacted by Division of Subsistence staff during the 2016 salmon fishing season described attempting to increase their harvests of sockeye and coho salmon in order to meet their households' needs during a summer of restrictions that significantly limited their Chinook salmon harvests.[10] However, the Chinook salmon run overlaps the sockeye run, so fishing for sockeye is also restricted until the Chinook run has dwindled, after the 'best drying weather' has deteriorated. Likewise, respondents described coho fishing as limited by processing capacity; these fish do not arrive until late in the summer, when cool rainy weather makes drying fish even more difficult.

Lower Kuskokwim River Area communities accounted for 73% of the total estimated Chinook salmon subsistence harvest in the Kuskokwim Area, 84% of the total chum salmon harvest, 73% of the total sockeye salmon harvest, and 65% of the total coho salmon harvest. In 2016, residents of Bethel accounted for approximately 26% of estimated total KMA subsistence-caught Chinook salmon, 43% of the coho salmon harvest, 31% of the sockeye salmon harvest, and 29% of the chum salmon harvest (Table 5-1).

10. Chris McDevitt, Kuskokwim Area subsistence resource specialist, ADF&G, Fairbanks, personal communication, March 19, 2019.

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. Over decades, the number of households harvesting salmon specifically for dog food has declined due to decreased use of dog teams for transportation. In 2016, data show that 1,820 households reported harvests of 24,406 salmon for use as dog food (Table 5-4), nearly five times the 2014 estimate (5,249 fish). About 39% of the salmon reported as fed to dogs were coho salmon (9,492 fish); 29% were sockeye salmon (7,142); 28% were chum salmon (6,883 fish); and 3% were pink salmon (709 fish). Households do not target Chinook salmon for dog food; however, 202 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, rod and reel, or fish wheel; Table 5-5). Households that harvested salmon were asked to provide information on the gear type(s) used by their household for harvesting salmon. In 2016, out of 2,157 contacted fishing households that responded to gear type questions, 1,796 (83%) reported salmon fishing with drift gillnets, 188 (9%) reported set gillnets, 149 (7%) reported subsistence rod and reel gear, and 24 (1%) reported a fish wheel as a gear type they used for subsistence salmon fishing in 2016. 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 and the number of salmon retained from commercial fishing activities for subsistence is usually low. The lack of salmon buyer/processors in the KMA meant that few fishers participated in commercial fishing; no fish were reported as retained from commercial catches for subsistence use (Table 5-6) (Poetter and Tiernan 2017).

Other Fish

Harvest data for nonsalmon fish species are also collected as part of the postseason salmon survey. In 2016, reported harvests of nonsalmon species by residents of surveyed communities in the Kuskokwim Area included 28,929 humpback whitefish; 33,053 broad whitefish; 9,618 cisco (including Bering and least ciscoes); 5,633 sheefish; 23,602 burbot; 98,464 northern pike; 164,499 Alaska blackfish; 198,606 smelt (predominantly rainbow smelt); 16,615 Pacific herring; 3,368 Arctic grayling; 5,653 char/Dolly Varden; and 1,355 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 harvests of salmon and nonsalmon 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 five 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 eight Central Kuskokwim communities (Lower Kalskag, Upper Kalskag, Aniak, Chuathbaluk, Crooked Creek, Red Devil, Sleetmute, and Stony River), the five 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 three Upper Kuskokwim communities (McGrath, Nikolai, and Takotna), the top five 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, 2016.

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	106	64	1,963	1,707	456	1,673	130	5,929
Eek	96	43	1,460	888	410	681	58	3,497
Kasigluk[b]	114	59	951	1,543	394	1,485	24	4,397
Nunapitchuk[b]	121	67	1,695	2,508	492	2,422	26	7,143
Atmautluak[b]	67	39	763	1,562	81	1,609	83	4,098
Napakiak[b]	100	49	1,151	2,132	506	2,091	220	6,100
Napaskiak[b]	107	58	1,535	2,086	726	1,901	95	6,343
Oscarville[b]	15	15	208	329	134	240	8	919
Bethel[c]	1,913	588	9,462	16,730	16,801	13,494	1,564	58,051
Kwethluk[b]	172	64	1,731	2,464	682	2,326	209	7,412
Akiachak[b]	165	89	3,438	2,726	2,007	2,176	199	10,546
Akiak[b]	88	40	1,274	3,772	2,403	5,803	649	13,901
Tuluksak	97	45	709	1,249	482	2,698	158	5,296
Lower Kuskokwim	**3,161**	**1,220**	**26,340**	**39,696**	**25,574**	**38,599**	**3,423**	**133,632**
Lower Kalskag[b]	84	44	578	284	228	624	0	1,714
Kalskag (Upper)[b]	62	37	838	1,176	722	1,055	87	3,878
Aniak[b]	178	159	1,293	8,380	7,530	2,422	478	20,103
Chuathbaluk	31	28	203	210	149	347	92	1,001
Middle Kuskokwim	**355**	**268**	**2,912**	**10,050**	**8,629**	**4,448**	**657**	**26,696**
Crooked Creek	36	26	384	264	298	831	2	1,779
Red Devil	8	5	69	238	166	129	0	602
Sleetmute	34	25	169	458	524	268	24	1,443
Stony River	13	11	33	95	29	14	11	182
Lime Village	9	--	35	541	123	232	225	1,156
McGrath[b]	127	64	384	199	769	150	0	1,502
Takotna	25	19	0	5	90	5	2	102
Nikolai	36	36	367	34	614	205	7	1,227
Telida[a]	2	--	--	--	--	--	--	--
Upper Kuskokwim	**290**	**186**	**1,441**	**1,834**	**2,613**	**1,834**	**271**	**7,993**
Kuskokwim River	**3,896**	**1,674**	**30,693**	**51,580**	**36,816**	**44,881**	**4,351**	**168,321**
Quinhagak	172	92	4,822	1,691	2,014	848	115	9,490
Goodnews Bay	78	37	654	975	378	219	41	2,267
Platinum	17	17	99	381	180	78	20	758
South Kuskokwim Bay	**267**	**146**	**5,575**	**3,047**	**2,572**	**1,145**	**176**	**12,515**
Mekoryuk[a]	--	--	--	--	--	--	--	--
Newtok[a]	--	--	--	--	--	--	--	--
Nightmute[a]	--	--	--	--	--	--	--	--

-continued-

Table 5-1.–Page 2 of 2.

Community	Households		Estimated salmon harvest					
	Total	Contacted	Chinook	Sockeye	Coho	Chum	Pink	Total
Toksook Bay[a]	--	--	--	--	--	--	--	--
Tununak[a]	--	--	--	--	--	--	--	--
Chefornak[a]	--	--	--	--	--	--	--	--
Bering Sea Coast	--	--	--	--	--	--	--	--
Total	**4,163**	**1,820**	**36,268**	**54,627**	**39,388**	**46,026**	**4,527**	**180,836**

Source Poetter and Tiernan, 2017

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 2016 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, 1989–2016.

	Households		Estimated salmon harvest					
Year	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
2016	4,163	1,820	36,268	54,627	39,388	46,026	4,527	180,836
5-year average (2010–2015)	4,285	1,710	35,356	46,473	36,255	61,610	1,499	181,193
10-year average (2005–2015)	4,448	1,566	62,120	46,646	37,548	63,654	1,411	211,380
15-year average (2000–2015)	4,500	1,789	70,057	45,185	38,203	64,148	1,405	218,624
Historical average (1989–2015)	4,040	1,800	79,711	45,046	40,303	75,515	1,405	241,147

Source Poetter and Tiernan, 2017

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, 2016.

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[a]	90	0	--	--	--	--	--	--	--	--	--
North Kuskokwim Bay	**90**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Tuntutuliak	106	64	89	4	191	11	11	0	22	0	44
Eek	96	43	66	4	117	0	0	117	0	0	117
Kasigluk	114	59	69	0	158	0	0	0	0	0	0
Nunapitchuk	121	67	73	7	204	0	11	0	99	1	111
Atmautluak	67	39	56	1	174	0	0	0	0	0	0
Napakiak	100	49	66	0	118	0	0	0	0	0	0
Napaskiak	107	58	64	4	210	0	42	0	273	42	357
Oscarville	15	15	10	1	13	0	0	1	2	3	6
Bethel	1,913	588	840	30	1,470	0	17	837	1,603	50	2,507
Kwethluk	172	64	144	3	406	0	0	0	0	31	31
Akiachak	165	89	95	3	229	0	139	439	89	0	667
Akiak	88	40	61	9	340	0	0	112	1,444	19	1,575
Tuluksak	97	45	73	3	216	0	0	0	176	4	180
Lower Kuskokwim	**3,161**	**1,220**	**1,706**	**69**	**3,846**	**11**	**220**	**1,506**	**3,708**	**150**	**5,595**
Lower Kalskag	84	44	55	3	140	0	0	0	6	0	6
Kalskag (Upper)	62	37	46	6	134	0	0	416	497	66	979
Aniak	178	159	113	9	320	0	6,824	6,605	1,845	461	15,735
Chuathbaluk	31	28	22	1	46	0	0	0	34	0	34
Middle Kuskokwim	**355**	**268**	**236**	**19**	**640**	**0**	**6,824**	**7,021**	**2,382**	**527**	**16,754**
Crooked Creek	36	26	25	2	47	0	0	0	455	0	455
Red Devil	8	5	8	0	15	0	0	0	0	0	0
Sleetmute	34	25	22	2	39	0	0	226	73	12	311
Stony River	13	11	8	1	11	0	0	0	11	11	0
Lime Village[a]	9	--	2	0	6	0	0	0	0	0	0
McGrath	127	64	75	6	200	141	64	105	57	0	367

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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
Takotna	25	19	18	0	48	0	0	0	0	0	0
Nikolai	36	36	25	2	76	50	30	590	195	7	872
Telida[a]	2	--	–	–	–	–	–	–	–	–	--
Upper Kuskokwim	**290**	**186**	**183**	**13**	**442**	**191**	**94**	**921**	**791**	**30**	**2,005**
Kuskokwim River	**3,896**	**1,674**	**2,125**	**101**	**4,928**	**202**	**7,138**	**9,448**	**6,881**	**707**	**24,354**
Quinhagak	172	92	98	2	170	0	0	44	0	0	44
Goodnews Bay	78	37	36	1	101	0	4	0	2	0	6
Platinum	17	17	9	1	17	0	0	0	0	2	2
South Kuskokwim Bay	**267**	**146**	**143**	**4**	**288**	**0**	**4**	**44**	**2**	**2**	**52**
Mekoryuk[a]	--	--	--	--	--	--	--	--	--	--	--
Newtok[a]	--	--	--	--	--	--	--	--	--	--	--
Nightmute[a]	--	--	--	--	--	--	--	--	--	--	--
Toksook Bay[a]	--	--	--	--	--	--	--	--	--	--	--
Tununak[a]	--	--	--	--	--	--	--	--	--	--	--
Chefornak[a]	--	--	--	--	--	--	--	--	--	--	--
Bering Sea Coast	--	--	--	--	--	--	--	--	--	--	--
Total	**4,163**	**1,820**	**2,268**	**105**	**5,216**	**202**	**7,142**	**9,492**	**6,883**	**709**	**24,406**

Source Poetter and Tiernan, 2017

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, 2016.

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	70	29	41	--	--
Eek	59	5	54	--	--
Kasigluk	62	--	62	--	--
Nunapitchuk	82	2	80	--	--
Atmautluak	43	--	43	--	--
Napakiak	62	2	60	--	--
Napaskiak	72	3	69	--	--
Oscarville	12	--	11	1	--
Bethel	833	29	762	42	--
Kwethluk	102	9	90	3	--
Akiachak	138	10	128	--	--
Akiak	67	10	57	--	--
Tuluksak	59	2	53	4	--
Lower Kuskokwim	**1661**	**101**	**1510**	**50**	**0**
Lower Kalskag	44	6	28	--	10
Kalskag (Upper)	38	1	37	--	--
Aniak	92	6	61	18	7
Chuathbaluk	22	1	19	2	--
Middle Kuskokwim	**196**	**14**	**145**	**20**	**17**
Crooked Creek	19	1	17	1	--
Red Devil	8	--	6	2	--
Sleetmute	19	6	11	1	1
Stony River	6	2	--	4	--
Lime Village	5	4	--	1	--
McGrath	35	21	--	8	6
Takotna	4	3	--	1	--
Nikolai	14	4	--	10	--
Telida[b]	--	--	--	--	--
Upper Kuskokwim	**110**	**41**	**34**	**28**	**7**
Kuskokwim River	**1,967**	**156**	**1,689**	**98**	**24**
Quinhagak	129	9	87	33	--
Goodnews Bay	51	17	17	17	--
Platinum	10	6	3	1	--
South Kuskokwim Bay	**190**	**32**	**107**	**51**	**0**
Mekoryuk[b]	--	--	--	--	--
Newtok[b]	--	--	--	--	--
Nightmute[b]	--	--	--	--	--
Toksook Bay[b]	--	--	--	--	--

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Table 5-5.–Page 2 of 2.

Community	Total households[c]	Gear types[a] Setnet	Driftnet	Rod and reel	Fish wheel
Tununak[b]	--	--	--	--	--
Chefornak[b]	--	--	--	--	--
Bering Sea Coast	--	--	--	--	--
Total	**2,157**	**188**	**1,796**	**149**	**24**

Source Poetter and Tiernan, 2017

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

b. Community was not contacted during the 2016 study period.

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

-- Data not available.

Table 5-6.–Estimated number of salmon retained from commercial harvest for subsistence use, Kuskokwim Area, 2016.

Community	Households		Estimated 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	106	64	0	0	0	0	0	0
Eek	96	43	0	0	0	0	0	0
Kasigluk	114	59	0	0	0	0	0	0
Nunapitchuk	121	67	0	0	0	0	0	0
Atmautluak	67	39	0	0	0	0	0	0
Napakiak	100	49	0	0	0	0	0	0
Napaskiak	107	58	0	0	0	0	0	0
Oscarville	15	15	0	0	0	0	0	0
Bethel	1,913	588	0	0	0	0	0	0
Kwethluk	172	64	0	0	0	0	0	0
Akiachak	165	89	0	0	0	0	0	0
Akiak	88	40	0	0	0	0	0	0
Tuluksak	97	45	0	0	0	0	0	0
Lower Kuskokwim	**3,161**	**1,220**	**0**	**0**	**0**	**0**	**0**	**0**
Lower Kalskag	84	44	0	0	0	0	0	0
Kalskag (Upper)	62	37	0	0	0	0	0	0
Aniak	178	159	0	0	0	0	0	0
Chuathbaluk	31	28	0	0	0	0	0	0
Middle Kuskokwim	**355**	**268**	**0**	**0**	**0**	**0**	**0**	**0**
Crooked Creek	36	26	0	0	0	0	0	0
Red Devil	8	5	--	--	--	--	--	--
Sleetmute	34	25	0	0	0	0	0	0
Stony River	13	11	0	0	0	0	0	0
Lime Village[a]	9	--	--	--	--	--	--	--
McGrath	127	64	0	0	0	0	0	0
Takotna	25	19	0	0	0	0	0	0

-continued-

Table 5-6.–Page 2 of 2.

Community	Households		Estimated salmon					
	Total	Responding	Chinook	Sockeye	Coho	Chum	Pink	Total
Nikolai	36	36	0	0	0	0	0	0
Telida[a]	2	--	--	--	--	--	--	--
Upper Kuskokwim	**290**	**186**	**0**	**0**	**0**	**0**	**0**	**0**
Kuskokwim River	**3,896**	**1,674**	**0**	**0**	**0**	**0**	**0**	**0**
Quinhagak	172	92	0	0	0	0	0	0
Goodnews Bay	78	37	0	0	0	0	0	0
Platinum	17	17	0	0	0	0	0	0
South Kuskokwim Bay	**267**	**146**	**0**	**0**	**0**	**0**	**0**	**0**
Mekoryuk[a]	--	--	--	--	--	--	--	--
Newtok[a]	--	--	--	--	--	--	--	--
Nightmute[a]	--	--	--	--	--	--	--	--
Toksook Bay[a]	--	--	--	--	--	--	--	--
Tununak[a]	--	--	--	--	--	--	--	--
Chefornak[a]	--	--	--	--	--	--	--	--
Bering Sea Coast	--	--	--	--	--	--	--	--
Total	**4,163**	**1,820**	**0**	**0**	**0**	**0**	**0**	**0**

Source Poetter and Tiernan, 2017

a. These communities were not contacted during the 2016 study period.

-- Data not available.

Note: There were no commercial openers in the Kuskokwim River in the 2016 study period.

Table 5-7.–Subsistence nonsalmon fish harvests by community, Kuskokwim Area, 2016.

Community	Households		Reported salmon harvest												
	Total	Contacted	Humpback whitefish	Broad whitefish	Cisco	Sheefish	Burbot	Northern pike	Blackfish	Grayling	Char/Dolly Varden	Herring	Smelt	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	106	64	968	2,716	132	145	506	6,859	11,711	3	18	96	873	0	--
Eek	96	43	392	318	574	33	681	2,886	5,817	63	25	9,777	1,973	9	22,548
Kasigluk	114	59	2,421	7,010	223	84	227	5,562	6,632	4	0	0	1,828	4	23,995
Nunapitchuk	121	67	2,668	5,200	43	154	727	11,090	9,764	0	0	0	5,625	6	35,277
Atmautluak	67	39	803	1,439	25	60	206	2,090	4,117	0	0	0	2,167	9	10,916
Napakiak	100	49	2,156	2,952	191	294	1,264	10,457	5,218	0	2	0	8,516	0	31,050
Napaskiak	107	58	1,229	410	95	145	580	5,855	7,693	10	25	0	7,815	27	23,884
Oscarville	15	15	110	25	13	31	80	547	1,750	2	3	0	700	1	3,262
Bethel	1,913	588	5,169	3,967	595	1,683	3,849	34,527	24,320	199	321	2,102	75,383	609	152,724
Kwethluk	172	64	627	1,168	38	106	513	3,741	1,238	33	264	0	6,842	67	14,637
Akiachak	165	89	1,871	1,258	538	680	2,686	5,916	55,899	22	10	143	20,944	5	89,972
Akiak	88	40	8,186	2,300	1,775	594	10,792	3,932	4,200	105	49	0	15,179	45	47,157
Tuluksak	97	45	397	974	367	120	712	1,982	2,564	201	60	58	17,658	1	25,094
Lower Kuskokwim	**3,161**	**1,220**	**26,997**	**29,737**	**4,609**	**4,129**	**22,823**	**95,444**	**140,923**	**642**	**777**	**12,176**	**165,503**	**783**	**504,543**
Lower Kalskag	84	44	259	437	209	133	249	105	1,916	12	7	0	3,574	0	6,901
Kalskag (Upper)	62	37	333	659	252	194	78	167	4,128	0	5	0	6,148	3	11,967
Aniak	178	159	564	689	1,787	152	292	415	2,450	353	247	0	6,534	131	13,614
Chuathbaluk	31	28	36	48	18	38	5	1	0	232	9	0	1,288	0	1,675
Middle Kuskokwim	**355**	**268**	**1,192**	**1,833**	**2,266**	**517**	**624**	**688**	**8,494**	**597**	**268**	**0**	**17,544**	**134**	**34,157**
Crooked Creek	36	26	37	44	16	117	1	10	0	234	24	0	0	0	483
Red Devil	8	5	0	85	0	63	1	57	0	51	9	0	0	0	266
Sleetmute	34	25	198	181	635	117	17	48	0	254	1	0	0	0	1,451
Stony River	13	11	107	110	0	19	9	1	0	60	0	0	0	0	306
Lime Village[a]	9	--	0	490	0	0	0	68	0	96	0	0	0	1	655
McGrath	127	64	121	260	163	498	20	409	367	971	10	0	0	5	2,824
Nikolai	36	36	200	100	633	155	0	354	100	38	13	0	0	0	1,593
Takotna	25	19	5	0	0	0	0	26	0	61	0	0	0	0	92

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Table 5-7.–Page 2 of 2.

Community	Households		Reported salmon harvest												
	Total	Contacted	Humpback whitefish	Broad whitefish	Cisco	Sheefish	Burbot	Northern pike	Blackfish	Grayling	Char/Dolly Varden	Herring	Smelt	Rainbow trout	Total
Telida[a]	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Upper Kuskokwim	**290**	**186**	**668**	**1,270**	**1,447**	**969**	**48**	**973**	**467**	**1,765**	**57**	**0**	**0**	**6**	**7,670**
Kuskokwim River	**3,896**	**1,674**	**28,857**	**32,840**	**8,322**	**5,615**	**23,495**	**97,105**	**149,884**	**3,004**	**1,102**	**12,176**	**183,047**	**923**	**99,129**
Quinhagak	172	92	72	212	1,122	18	107	1,359	14,545	229	4,058	3,497	9,220	356	34,795
Goodnews Bay	78	37	0	0	123	0	0	0	70	35	293	448	6,206	75	7,250
Platinum	17	17	0	1	51	0	0	0	0	100	200	494	133	1	980
South Kuskokwim Bay	**267**	**146**	**72**	**213**	**1,296**	**18**	**107**	**1,359**	**14,615**	**364**	**4,551**	**4,439**	**15,559**	**432**	**43,025**
Mekoryuk[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Newtok[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nightmute[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Toksook Bay[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tununak[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chefornak[a]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bering Sea Coast	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	**4,163**	**1,820**	**28,929**	**33,053**	**9,618**	**5,633**	**23,602**	**98,464**	**164,499**	**3,368**	**5,653**	**16,615**	**198,606**	**1,355**	**100,835**

Source Poetter and Tiernan, 2017

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

-- Data not available.

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 five 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 three 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. 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 five fathoms in the special "redfish" harvest areas in the Naknek District. Thirdly, at their 2006 meeting, the BOF adopted regulations allowing the use of beach seines in Iliamna Lake, Six Mile Lake, and Lake Clark. In the Bristol Bay Area in 2016, 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 ft 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 2016

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 2016 commercial fishing emergency orders for Bristol Bay in commercial districts, see Table 8 in Salomone et al. (2017:34). 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 2016, a total of 1,172 permits were issued for the Bristol Bay Management Area; of those, 1,057 (90%) were returned (Table 6-1; Table 6-2). The largest number of permits were issued for the Nushagak (643 permits) and Naknek–Kvichak (420 permits) districts (Table 6-1). The number of permits issued in 2016 was slightly higher the 5-year (1,144 permits) the 10-year (1,115 permits), and the historical (1,099 permits) averages (Table 6-2).

Subsistence Salmon Harvests in 2016

Estimated total Bristol Bay subsistence salmon harvest in 2016 was 121,144 fish. The 2016 salmon harvest was below the 5-year (126,993 salmon), the 10-year (125,582 salmon), and the historical average (1983–2015) of 144,537 salmon (Table 6-2).

Chinook salmon harvests were estimated at 18,712 in 2016, an increase from the previous year's harvest of 13,874. Estimated sockeye salmon harvests for 2016 were 85,989, which was a decrease from the previous year's harvest of 99,535 fish. The 2016 sockeye salmon harvest was lower than recent 5-year average of 99,811 fish and below the 10-year average of 98,678 fish. The historical average (1983–2015) was 113,186 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 higher in 2016 (4,945 fish) than in 2015 (458 fish). The estimated harvest of chum salmon in 2016 (5,243 fish) was higher than the recent 5-year (4,645 fish) and 10-year (4,799 fish) averages, but below the historical average (1983–2015) of 6,281 fish. The coho salmon harvest in 2016 (6,255 fish) was lower than the previous year (7,659 fish), lower than the 5-year average at 7,322 fish, the 10-year average at 6,742 (Table 6-2), and the historical average (1983–2015) at 8,193 fish.

In 2016, the Bristol Bay subsistence salmon harvest was composed of 71% sockeye salmon, 15% Chinook salmon, 5% coho salmon, 4% chum salmon, and 4% pink salmon (Figure 6-1). Of the entire Bristol Bay Area subsistence salmon harvest in 2016, residents of Bristol Bay communities harvested 104,107 salmon (86%), and other Alaska residents harvested 17,037 salmon (14%) (Table 6-3).

In 2016, as over the last several decades, most of the Bristol Bay Area subsistence harvest was taken in the Naknek–Kvichak (46%) and the Nushagak (48%) districts (Figure 6-2). The remaining portion was taken in the Togiak district (5%), and the Egegik and Ugashik districts, each at about 1% (Figure 6-2). The Naknek–Kvichak total harvest of 55,508 salmon in 2016 (Table 6-1) was far lower than in 2015 (71,583 salmon) (Fall et al. 2018), and lower still than the 2014 harvest (67,603 salmon) (Fall et al. 2017). 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 14 Chinook salmon and 30,231 sockeye salmon in 2016 while those fishing in the Naknek River Subdistrict harvested 892 Chinook salmon and 22,005 sockeye salmon (Table 6-1). The 2016 subsistence harvest of 30,231 sockeye salmon in the Kvichak drainage (Table 6-1) was lower than the 2015 harvest of 39,279 (Fall et al. 2018) and lower than the 2014 harvest of 41,016 sockeye salmon (Fall et al. 2017).

Subsistence sockeye salmon harvests by communities in the Kvichak River drainage have declined since the early 1990s (Salomone et al. 2017:102). From 1998 to 2016, 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 2016 of 57,624 salmon (Table 6-1) was an increase from the previous year (46,248 salmon). The estimated harvest in 2015 of 46,248 salmon was lower than 2014 at 58,425 fish (Salomone et al. 2017:100). 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 2016 was 16,502 (Table 6-1) and was an increase from the previous two years of 12,117 Chinook in 2015, and 16,049 salmon in 2014. The lowest estimated Chinook harvests in the Nushagak District were 9,150 salmon in 2010 and 9,971 salmon in 2006 (Jones et al. 2013:99). The 2016 Nushagak District sockeye salmon harvest of 27,369 fish was slightly higher than the 2015 study year (25,240 salmon) (Table 6-1), with the highest harvest being in 2014, at 30,283 subsistence sockeye salmon harvested (Salomone et al. 2017:100).

The estimated total subsistence salmon harvest for the Togiak District in 2016, 6,017 fish (Table 6-1), was higher than the previous year's estimate of 4,249 fish (Fall et al. 2018), and slightly lower than the 2014 season (6,539 salmon) (Fall et al. 2017). Estimated salmon harvests for the Togiak District 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. Subsistence salmon household harvest surveys conducted in Togiak and Twin Hills for the 2016 calendar year also showed an increase in the participation in the 2016 harvest assessment program for both Togiak and Twin Hills.[1]

The estimated subsistence salmon harvest in the Ugashik District in 2016 was 1,432 fish, which was higher than the previous year at 1,214, and higher than the 2014 season (842 fish) (Table 6-1). The 2016 harvest was above the 10-year average (2006–2015) of 1,189 fish (Salomone et al. 2017:100). In the Egegik District, the 2016 estimated subsistence salmon harvest of 563 fish (Table 6-1) was much lower than the 2015 estimate of 1,806 and the 2014 estimate of 1,366 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 (2006–2015) average of 1,821 salmon (Salomone et al. 2017:99).

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 2016 appear in Fall and Koster (2018)). 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

1. For more detailed information about the 2016 household survey results see Jones, B. and M. Cunningham (eds). *In prep.* Subsistence Harvest Assessment and Biological Sampling of Chinook Salmon in the Togiak River Drainage, Alaska, 2016 and 2017. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. NNN, Anchorage.

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:[2]

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. (2012a) 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 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)”event-place”:”Dillingham”,”author”:[{“family”:”BBNA (Bristol Bay Native Association. 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 (Krieg et al. 2005) includes detailed information about uses of nonsalmon fish in eight 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 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).

2. 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.

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 et al. 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 eight 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; 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; 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 three entries, and thus three taxa, 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; 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.[3] An expanded version of the database incorporating findings from eight 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.

3. 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, 2016.

Area and river system	Number of permits issued[a]	Estimated salmon harvest					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Naknek-Kvichak District	420	936	53,373	603	252	345	55,508
Naknek River Subdistrict	259	892	22,005	600	249	338	24,084
Kvichak River/Iliamna Lake Subdistrict:	159	14	30,231	3	2	7	30,257
Igiugig	1	0	60	0	0	0	60
Iliamna Community	3	0	455	0	0	0	455
Iliamna Lake-General	44	0	9,277	0	0	0	9,277
Kokhanok	22	4	6,477	3	2	7	6,493
Kvichak River	12	0	728	0	0	0	728
Lake Clark	46	0	4,845	0	0	0	4,845
Levelock	6	10	1,029	0	0	0	1,039
Newhalen River	13	0	4,461	0	0	0	4,461
Pedro Bay	9	0	1,327	0	0	0	1,327
Pile Bay	1	0	255	0	0	0	255
Six Mile Lake	6	0	1,318	0	0	0	1,318
Naknek or Kvichak (Site Unknown)	7	30	1,137	0	0	0	1,167
Egegik District	26	27	366	167	3	0	563
Ugashik District	19	106	1,100	199	20	9	1,432
Nushagak District	643	16,502	27,369	4,766	4,592	4,394	57,624
Igushik/Snake River	28	81	2,676	212	12	45	3,025
Nushagak Bay Commercial	60	1,058	2,624	653	161	164	4,660
Nushagak Bay Noncommercial	250	5,165	9,081	1,620	1,342	1,164	18,372
Nushagak River	135	5,506	4,509	1,068	2,077	2,511	15,671
Site Unknown	34	746	1,115	167	137	70	2,235
Wood River	194	3,947	7,364	1,045	864	440	13,660
Togiak District	70	1,140	3,780	521	377	198	6,017
Total	**1,172**	**18,712**	**85,989**	**6,255**	**5,243**	**4,945**	**121,144**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).
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 1,172 permits issued for the management area, 1,057 were returned (90.2%).
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, 1983-2016.

	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
2016	1,172	1,057	18,712	85,989	6,255	5,243	4,945	121,144
5-year average (2011–2015)	1,144	1,012	14,078	99,811	7,322	4,645	1,137	126,993
10-year average (2006–2015)	1,115	989	13,848	98,678	6,742	4,799	1,515	125,582
Historical average (1983–2015)	1,099	963	14,650	113,186	8,193	6,281	2,226	144,537

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 6-3.–Estimated subsistence salmon harvests by community, Bristol Bay Area, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Aleknagik	28	25	1,019	1,144	101	81	2	2,346
Clarks Point	13	12	203	602	549	90	34	1,478
Dillingham	379	339	9,732	16,313	3,034	3,147	3,701	35,927
Egegik	5	4	15	181	29	4	0	229
Ekwok	18	14	675	378	64	262	39	1,418
Igiugig	8	6	7	522	0	0	0	529
Iliamna	17	16	11	5,714	0	0	0	5,725
King Salmon	75	70	224	3,963	192	38	19	4,436
Kokhanok	23	21	4	7,287	3	2	7	7,303
Koliganek	20	18	1,082	787	321	303	17	2,510
Levelock	8	7	10	1,407	0	0	0	1,417
Manokotak	23	20	52	2,310	131	13	43	2,548
Naknek	85	74	385	9,873	368	134	214	10,973
New Stuyahok	43	33	2,874	1,591	437	496	318	5,716
Newhalen	12	12	0	4,663	0	0	0	4,663
Nondalton	9	8	0	2,320	0	0	0	2,320
Pedro Bay	13	11	0	2,036	0	0	0	2,036
Pilot Point	5	4	13	625	118	18	9	781
Port Alsworth	39	37	1	4,165	0	0	0	4,166
Port Heiden	1	1	0	38	0	0	0	38
South Naknek	18	17	23	1,112	58	31	35	1,259
Togiak	62	57	1,086	3,398	471	348	198	5,502
Twin Hills	8	8	54	382	50	29	0	515
Ugashik	5	5	20	210	42	0	0	272
Subtotal, Bristol Bay	**917**	**819**	**17,491**	**71,020**	**5,967**	**4,996**	**4,633**	**104,107**
Anchor Point	1	1	0	255	0	0	0	255
Anchorage	128	121	544	7,475	35	71	84	8,209
Big Lake	4	4	10	898	0	4	2	914
Chugiak	6	5	14	576	0	0	0	590
Copper Center	1	1	0	0	0	0	0	0
Cordova	1	1	6	148	0	0	0	154
Delta Junction	1	1	0	37	0	0	0	37
Eagle River	12	11	5	167	2	3	3	181
Fairbanks	14	11	74	195	0	11	1	281
Girdwood	3	3	4	88	0	3	0	95
Homer	8	8	69	633	32	7	30	771
Juneau	3	3	20	36	0	3	0	59
Kasilof	1	1	2	69	4	5	13	93
Kenai	7	6	48	126	33	9	19	235
King Cove	1	1	1	51	0	0	6	58
Kodiak City	7	5	0	204	0	0	0	204
Kotzebue	1	1	19	18	0	0	0	37

-continued-

Table 6-3.–Page 2 of 2.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Nikiski	1	1	0	17	12	0	0	29
North Pole	2	2	5	74	0	0	0	79
Palmer	14	14	84	1,439	64	4	23	1,614
Seldovia	2	2	3	106	0	0	2	111
Sitka	3	3	52	23	8	14	0	97
Soldotna	5	5	157	125	0	35	0	317
Talkeetna	2	1	4	20	54	14	128	220
Unalaska	1	0	0	0	0	0	0	0
Wasilla	26	26	100	2,188	44	63	1	2,396
Subtotal, other Alaska	**255**	**238**	**1,221**	**14,968**	**287**	**247**	**312**	**17,037**
Total	**1,172**	**1,057**	**18,712**	**85,989**	**6,255**	**5,243**	**4,945**	**121,144**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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
Clark's 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*
Herring, Pacific	*Clupea harengus pallasi*	*Iqalluarpak*	
Herring spawn on kelp		*Melucuaq*	
Starry flounder	*Platichthys stellatus*	*Naternaq*	
Halibut, Pacific	*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.

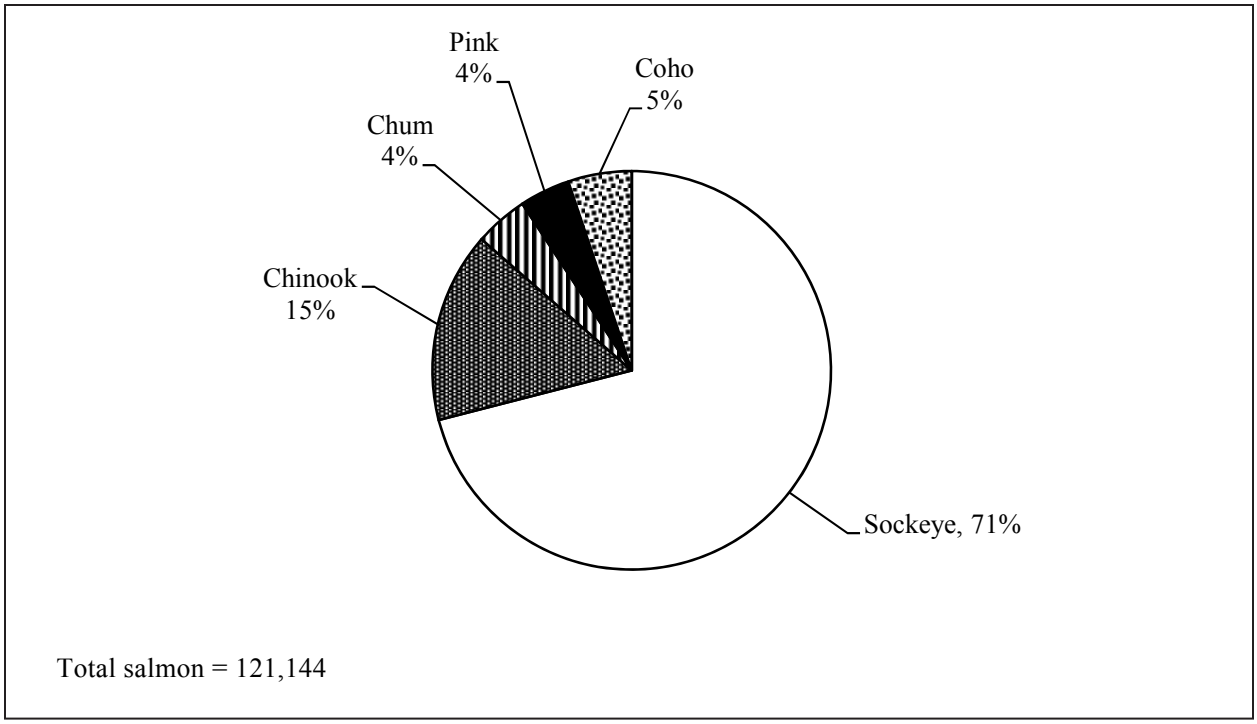

Figure 6-1.–Composition of Bristol Bay area subsistence salmon harvest by species, 2016.

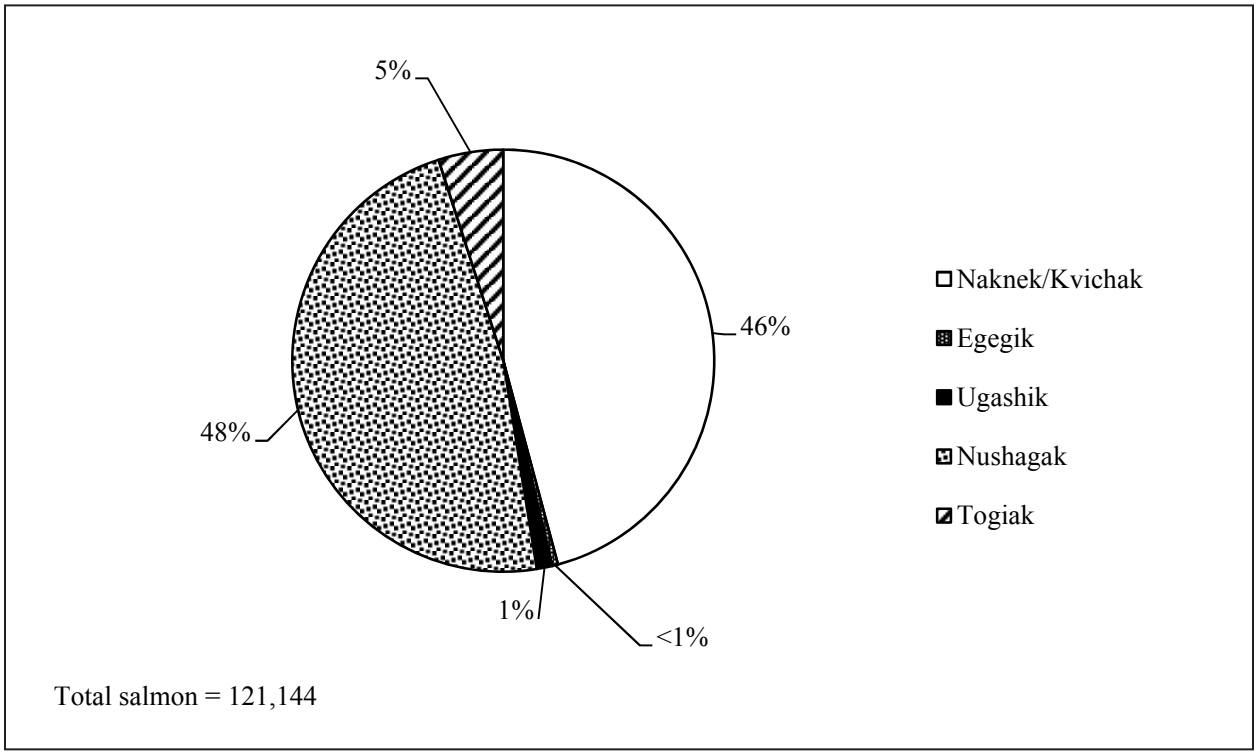

Figure 6-2.–Subsistence salmon harvests by district, Bristol Bay Area, 2016.

CHAPTER 7: CHIGNIK MANAGEMENT AREA

Background

The Chignik Management Area (CMA) is also referred to as Area L and 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 five communities in Alaska Department of Fish and Game's (ADF&G) salmon Chignik Management Area (CMA): Chignik (commonly referred to as Chignik Bay) with a 2016 estimated population of 95, Chignik Lagoon (population 85), Chignik Lake (population 64), Perryville (population 110 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 (2015–2016) 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." Alaska Population Estimates by borough, Census Area, City, and Census Designated Place (CDP), 2010 to 2017. Accessed August 22, 2018. 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, but not during the 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 one 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 through 2005, the CMA commercial salmon fishery was managed based on two 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 commercial permit

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.

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 one 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
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.

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 was 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 two 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 were considered late-run escapement. Starting 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 two 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 2017).

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, 2014–2016 the Division of Subsistence staff and survey technicians trained and hired by the Division of Subsistence from each community administered face-to-face household subsistence salmon harvest surveys in each of the 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

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

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 2016, the number of subsistence permits issued for the Chignik Area totaled 118 permits, and 93 (79%) were returned with harvest information to ADF&G or collected during post season household surveys (Table 7-1). Of these 83 (70% 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 71 (86%) of the permits issued in these communities. The remaining 35 permits issued (30% of the total permits issued for the area) were issued to and 22 (63%) returned by residents of other Alaska communities (Table 7-2). The previous year, in 2015, 123 permits were issued and 119 were returned, a return rate of 97%, or 23% higher than in 2016. Since 1977, the number of subsistence salmon permits issued for the Chignik Area has averaged 105 per year, with 74 permits (71%) returned. The average permits issued both over the last 10 years (2006–2015), and the recent 5-year average (2011–2015) have averaged 110 permits issued, but the return rate was higher for the recent 5-year average of 96 permits (87%) returned than for the 10-year average with 88 permits (80%) 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 2016, the total estimated CMA salmon harvest was 9,168 fish, which was 24% lower than the 2015 estimate of 12,121 salmon harvested, and also less than the historical (1977–2015) average of 11,171 salmon (18% lower), the 10-year (2006–2015) average of 10,576 salmon (13% lower) as well as the 5-year (2011–2015) average of 10,796 (15% lower) salmon harvested in the Chignik Area (Table 7-1).

In 2016, the Chignik Area subsistence salmon harvest was composed of 89% sockeye salmon (8,150 fish), 6% coho salmon (552 fish), 3% pink salmon (251 fish), 2% chum salmon (118 fish), and 1% Chinook salmon (97 fish) (Table 7-1; Figure 7-2). Sockeye harvests in 2016 were 17% lower than the previous year of 9,854 fish yet nearly the same as the 5-year (2011–2015) 10-year (2006–2015) and historical (1977–2015) averages (Table 7-1).

Harvests of coho, Chinook, chum, and pink salmon in 2016 were 39–60% lower compared to the year prior. Coho salmon harvests in 2016 totaled only 552 fish, the lowest harvest in 25 years. Compared to previous years, coho salmon harvests were 60% less than the previous year's harvest of 1,393 fish and from 57%–61% lower than the recent 5-year, 10-year, and historical averages. Like coho, pink salmon harvests in 2016 were the lowest on record in 27 years with 251 fish harvested. Compared to previous years, pink salmon harvests were 48% less than the previous year's harvest of 481 fish and between 65%–71% lower than the recent 5-year, 10-year, and historical averages. Chum salmon harvests in 2016 totaled 118 fish, the lowest harvest in eight years, and 49% less than the previous year of 233 fish; and between 42%–50% less than the recent 5-year (2011–2015) average of 236 fish; 10-year (2005–2015) average of 203 fish, and the historical (1977–2015) average of 248 fish. Chinook salmon harvests in 2016 totaled 97 fish, 39% less than the previous year's harvest of 160 fish. Chinook salmon harvests in 2016 were12% less than the recent

5-year (2011–2015) average of 111 fish, 21% less than the 10-year (2006–2015) average of 123 fish, and 12% higher than the historical average (1977–2015) of 87 fish harvested (Table 7-1).

CMA Subsistence Salmon Harvests by Community

Most of the 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 2016, 70% of permits (83) were issued to Chignik area residents, and they were responsible for 86% (7,861 fish) of the total salmon harvest while residents of other parts of Alaska held 35 permits (30% of all permits issued) and harvested 14% (1,307 fish) of the 9,168. By community, Chignik Lagoon and Perryville residents each acquired more permits than other communities located within the CMA; with 26 permits issued (22%) in Chignik Lagoon, and 25 (21%) in Perryville. These two communities each harvested the most salmon of any other community as well as near equivalent amounts of salmon, with Perryville harvesting 2,777 fish (30%) of all salmon harvested, and Chignik Lagoon harvesting 2,760 (30%) total salmon. Chignik Lake residents acquired 20 permits (15%) and harvested 1,701 fish (19%), and Chignik Bay had 12 permits (10%) and harvested 623 fish (7%) of all salmon harvested. Ivanof Bay residents acquired no permits in 2016 (Table 7-2; Figure 7-6).

Community Salmon Harvests by Species

Sockeye salmon were the most harvested species of salmon in the CMA in 2016 as well as historically, totaling 8,150 salmon, a 17% decrease from 2015 sockeye harvests of 9,854 fish (Table 7-1). In 2016, the communities within the CMA harvested a total of 6,893 sockeye salmon (85%) of total sockeye harvests, while all nonresidents harvested 1,257 fish (15%) of sockeye salmon harvests. The total sockeye salmon harvest in the CMA by community was apportioned as follows: Chignik Lagoon 2,559 (31%), Perryville 2,034 (25%); Chignik Lake 1,694 (21%), Chignik Bay 605 (7%), Ivanof Bay zero fish (0%), and residents of other Alaska communities 1,257 (15%) (Table 7-2; Figure 7-7).

Coho were the second most harvested species of salmon in the CMA in 2016, totaling 552 fish, a 60% decrease from the previous year's harvest of 1,393 (Table 7-1). As in all previous years, Perryville harvested the majority of coho salmon with a total of 484 harvested, which represented 88% of the total CMA coho harvests in 2016. Perryville residents also harvested the highest numbers of pink and chum salmon in 2016, responsible for 116 (53%) of pink salmon and 116 (98%) of chum salmon harvests in 2016 (Table 7-2; Figure 7-7). Chignik Lagoon residents harvested the second highest quantity of coho and pink salmon with 45 (8%) of total coho salmon harvested, and 112 (44%) pink salmon harvested. Of a total of 97 estimated Chinook salmon harvested in the Chignik area, the communities harvesting the most were non-local residents residing in Homer with 42 fish (43%), and Chignik Lagoon residents harvested 41 fish (42%). Perryville harvested the third most Chinook salmon at nine fish (9%). Perryville is far from the other three 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 and Chinook 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 2016 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 Chignik Bay and Lagoon subarea 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. 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 Perryville subarea corresponds to the Perryville and Western CMA

commercial fishing districts. There were no reports of subsistence harvests that occurred in 2016 from the Central or Eastern districts of the CMA.

The following section describes estimated salmon harvests, by location and species for 2016. Nearly the same amount of total salmon, including sockeye salmon, were harvested from the Chignik Bay and Lagoon and the Chignik Lake subareas. In the Chignik Bay and Lagoon subarea, 43% (3,982) of all salmon and 48% (3,879) of sockeye salmon were harvested. In the Chignik Lake subarea, 39% (3,560) of all salmon and 43% (3,471) of sockeye salmon were harvested. The highest amount of Chinook salmon harvested 81 (84%) came from the Chignik Lake subarea in the Chignik River (Table 7-3).

The reported total salmon harvests, as well as sockeye harvests, in the Perryville subarea in 2016 were significantly less than the other two subareas of the CMA. In this subarea, 18% (1,626) of all salmon and 10% (799) of sockeye salmon were harvested. This subarea, however, ranked higher than the other subregions for coho 87% (481); pink 89% (223); and chum 98% (116) salmon harvests. (Table 7-3).

Table 7-4 shows the estimated subsistence salmon harvests by species, fishing location, and date in 2016. Harvest dates shown in this table are divided into two periods of time, harvests on or before July 11 and harvests after July 11, which was the date in 2016 the Department estimated when the sockeye salmon return through the Chignik River weir was composed of approximately 50% early run fish and 50% late run fish based on inseason genetic samples collected (Wilburn and Stumpf 2017). 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 2016, 33% (3,057 fish) of the total subsistence harvest of 9,168 fish occurred on or before July 11, and 67% (6,111 fish) were harvested after July 11, most of which (5,186 or 85%) were sockeye. Of all sockeye salmon harvested on or before July 11, most occurred in the Chignik Bay and Lagoon subarea in which 58% (1,717) of sockeye were harvested. After July 11, 50% (2,582) of sockeye harvests occurred in Chignik Lake subarea followed by Chignik Bay and Lagoon subarea where 42% (2,162) of sockeye harvests occurred during this time. Of the total 552 coho harvests, most, 91%, occurred after July 11, of which 88% (441 fish) of the total coho harvest occurring in the Perryville subarea. (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 2016, there were no Federal permits issued to

residents of the Chignik Area. (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 2016, Chignik commercial fishing boats reported on their commercial fish tickets, removing 345 sockeye salmon, 35 Chinook salmon, and 24 coho salmon from their commercial harvest for home pack (Wilburn and Stumpf 2017). Houshold surveys combined with fish ticket reports indicated that a total of 350 sockeye, 323 Chinook, 164 coho, 5 chum, and 2,137 pink salmon were removed from commercial fisheries for home pack in 2016 (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 2016 (Fall and Koster 2018). 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 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

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

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 six 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).

In 2016, commercial salmon harvests in the CMA were less than average for all resources and local subsistence harvests were also less than average (Wilburn and Stumpf 2017). In early 2017, subsistence salmon harvest surveys were conducted in the communities of Chignik Bay, Chignik Lake, Chignik Lagoon, and Perryville by the Division of Subsistence. Harvest and use data for 2016 was collected and general harvest assessment questions were asked to compare how harvests and use compared to recent years (past five years) and general observations about the resource. Many households that harvested salmon in these communities overall indicated that all species of salmon were less available, harder to catch and more effort was needed by many to get enough fish. When asked about the first sockeye run many households commented that thought the run came in earlier than in recent years, and with larger than average sized fish, especially compared to 2015 where fish were reportedly small, and in 2014 the run showed up very late. The first run, however; was weak according to some respondents, and an average of 41% of households in these communities that used or harvested salmon responded that they used less salmon from the first run than in recent years providing a variety of reasons, with resource availability, busy, and personal reasons being the most common reasons given for less use. More households, 91% reported using or harvested sockeye salmon from the first run; whereas, 74% from the second run. Those harvesting and using salmon from the second run, 23% indicated their use and harvest was less than recent years, and just under half (41%) said they harvested and used about the same amount of salmon from the second run as previous years. Some respondents said that the second run came in a bit earlier than they recalled in the recent past, but the fish overall were quite small.

When asked about Chinook harvests, 40% of respondents in the four communities indicated that they harvested less than in recent years, 21 said they harvested the same, and 54% of households said they don't normally harvest Chinook. Personal reasons, time, and resource availability were the main reasons given for those that indicated they harvested less Chinook than in recent years. Other salmon, chum, pink, and coho, salmon, 47% of the households interviewed in all communities indicated that they don't normally harvest these species of fish; and the remaining 24% indicated their use and harvest was about the same, and 29% said it was less than had been in recent years.[8]

8. Hutchinson-Scarbrough, L. and M. Cunningham. *In prep.* Harvest Assessment of Subsistence Chinook Salmon in the Chignik Management Area. Alaska Department of Fish and Game Division of Subsistence Technical Paper No. NNN, Anchorage.

Table 7-1.–Historical state subsistence salmon harvests, Chignik Area, 1977–2016.

	Permits		Estimated salmon harvest					
Year	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
2016	118	93	97	8,150	552	118	251	9,168
5-year average (2011–2015)	110	96	111	8,096	1,331	236	721	10,496
10-year average (2006–2015)	110	88	123	8,087	1,400	203	762	10,576
Historical average (1977–2015)	105	74	87	8,690	1,291	248	854	11,171

-continued-

Table 7-1.–Page 2 of 2.

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018); 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, 2014, and 2015 post-season 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 state subsistence salmon harvests by community, Chignik Area, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Chignik Bay	12	9	3	605	15	0	0	623
Chignik Lagoon	26	22	41	2,559	45	2	112	2,760
Chignik Lake	20	18	2	1,694	0	0	4	1,701
Perryville	25	22	9	2,034	484	116	134	2,777
Subtotal, Chignik Area residents	**83**	**71**	**55**	**6,893**	**544**	**118**	**251**	**7,861**
Anchorage	7	4	0	292	0	0	0	292
Chugiak	2	2	0	0	0	0	0	0
Craig	1	0	0	0	0	0	0	0
Douglas	1	1	0	16	7	0	0	23
Homer	6	1	42	714	0	0	0	756
Kenai	1	1	0	0	0	0	0	0
Kodiak City	9	8	0	217	0	0	0	217
Petersburg	1	1	0	0	0	0	0	0
Seldovia	1	1	0	0	0	0	0	0
Seward	1	0	0	0	0	0	0	0
Unalaska	1	1	0	4	0	0	0	4
Wasilla	3	1	0	0	0	0	0	0
Wrangell	1	1	0	14	1	0	0	15
Subtotal, other Alaska residents	**35**	**22**	**42**	**1,257**	**8**	**0**	**0**	**1,307**
Total	**118**	**93**	**97**	**8,150**	**552**	**118**	**251**	**9,168**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 7-3.–State subsistence salmon harvests by species and subarea of harvest, Chignik Area, 2016.

Subarea of harvest[a]	Estimated salmon harvest					
	Chinook	Sockeye	Coho	Chum	Pink	Total
Chignik Bay and Lagoon	*10*	*3,879*	*68*	*2*	*24*	*3,982*
Chignik Bay	3	609	38	2	6	659
Chignik Lagoon	7	3,220	29	0	18	3,274
Central District	0	50	0	0	0	50
Chignik Lake	*81*	*3,471*	*3*	*0*	*4*	*3,560*
Chignik Lake	0	2,194	3	0	4	2,201
Chignik River	81	622	0	0	0	702
Clark River	0	656	0	0	0	656
Perryville	*7*	*799*	*481*	*116*	*223*	*1,626*
Perryville	7	736	291	59	185	1,278
Kametolook River	0	25	48	11	19	103
Ivanof Bay to Humpback Bay	0	34	142	28	18	223
Stepovak	0	0	0	17	0	17
East of Perryville	0	4	0	0	0	4
Total	**97**	**8,150**	**552**	**118**	**251**	**9,168**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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.–2016 Chignik Area state subsistence salmon harvests by species, fishing location, and date.

	Estimated salmon harvest[a]					
Subarea[b]	King	Sockeye	Coho	Chum	Pink	Total
Harvests on or before July 11						
Chignik Bay and Lagoon	3	1,717	9	0	0	1,729
Chignik Lake	2	889	0	0	0	891
Perryville	2	358	40	14	23	436
Subtotal, early harvest	7	2,964	49	14	23	3,057
Harvest after July 11						
Chignik Bay and Lagoon	7	2,162	58	2	24	2,253
Chignik Lake	78	2,582	3	0	4	2,669
Perryville	5	442	441	102	200	1,189
Subtotal, mid harvest	90	5,186	503	105	228	6,111
Total	97	8,150	552	118	251	9,168

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

a. Harvest estimates are from 2016 permit returns and systematic household surveys.

b. The Chignik Bay and Lagoon subarea corresponds to the portion of the Central District and the Chignik Bay District, not including 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 7-5.–Federal subsistence salmon harvests by community, Chignik Management Area, 2016.

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
2016[a]	323	350	164	5	2,137	2,978
5-year average (2011–2015)	110	463	18	50	7	648
10-year average (2006–2015)	84	385	32	25	4	531
Historical average (1977–2015)	104	541	79	989	271	1,982

a. The harvest includes reported salmon from both commercial fish tickets as well as household surveys.

Table 7-6.–Subsistence uses of nonsalmon finfishes by community, Chignik Area, 1989.

Common English name	Scientific name, if not previously given	Percentage of households using in Chignik Bay	Chignik Lagoon	Chignik Lake	Ivanof Bay	Perryville
Pacific herring		23	47	29	29	15
Pacific herring spawn on kelp		14	0	5	0	4
Walleye pollock	*Theragra chalcogramma*	3	0	0	0	0
Rainbow smelt[a]		11	0	48	0	0
Pacific halibut		89	100	67	100	96
Rainbow trout		3	0	24	57	7
Dolly Varden		23	7	38	86	56
Eulachon (candlefish)	*Thaleichthys pacificus*	23	40	33	100	78
Pacific cod (gray cod)		29	60	48	86	63
Sculpin	*Hemilepidotus sp.*	11	0	5	0	30
Starry flounder		6	0	19	14	0
Kelp greenling	*Hexagrammos decagrammus*	11	0	10	0	30
Arctic grayling		0	0	0	14	0
Sablefish (black cod)	*Anoplopoma fimbria*	0	7	5	0	0
Steelhead trout		0	13	5	0	0
Black rockfish	*Sebastes melanops*	0	7	0	0	22
Red (yelloweye) rockfish	*Sebastes ruberrimus*	3	0	0	0	4
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 7-7.–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	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* .

Table 7-8.–Federal subsistence salmon harvests by community, Chignik Management Area, 2016.

Community	Permits Issued	Returned	Reported salmon harvest Chinook	Sockeye	Coho	Chum	Pink	Total
No data reported for 2016								
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

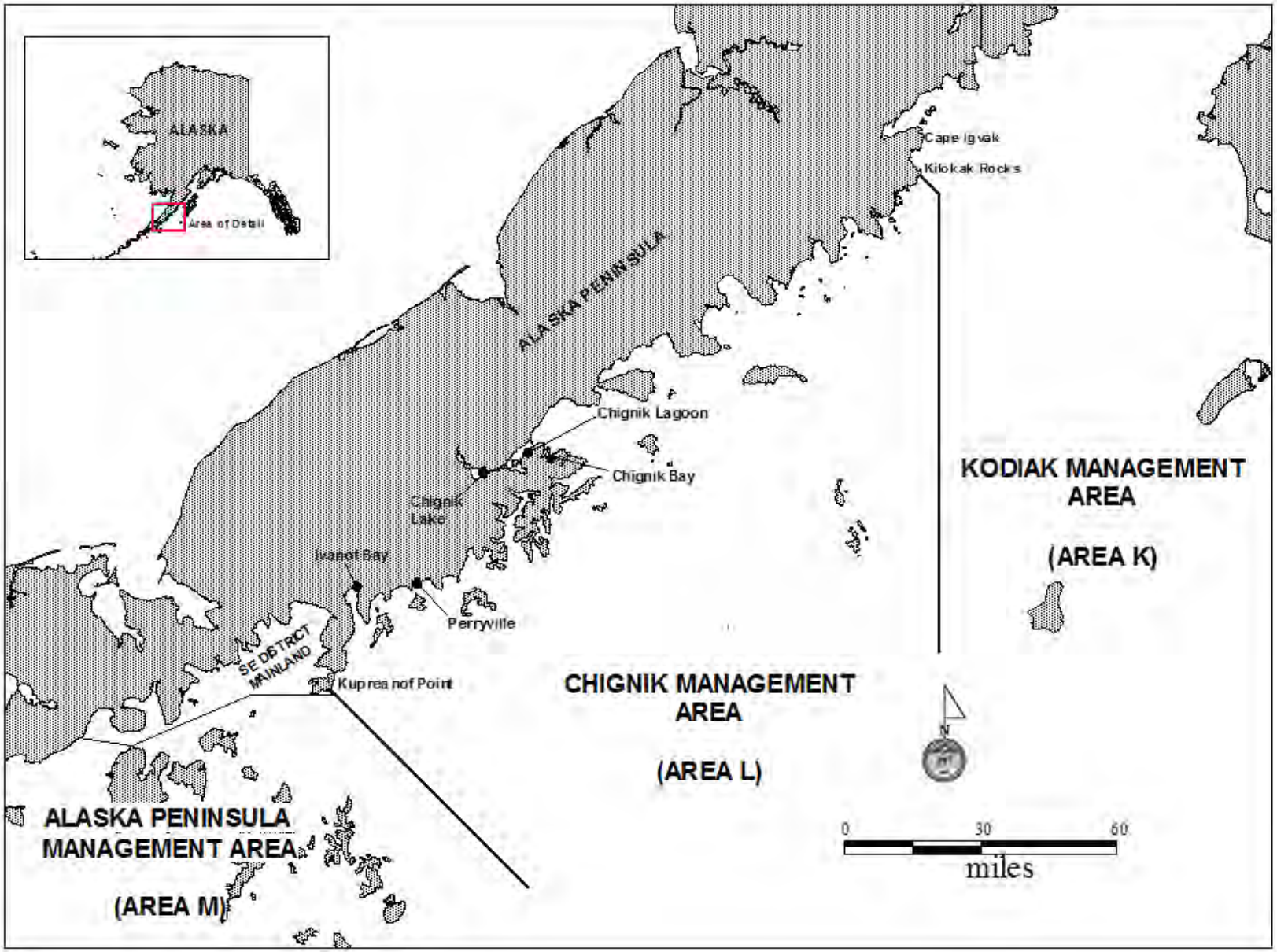

Figure 7-1.–Location of Chignik Management Area (CMA) and communities within the CMA on Alaska Peninsula.

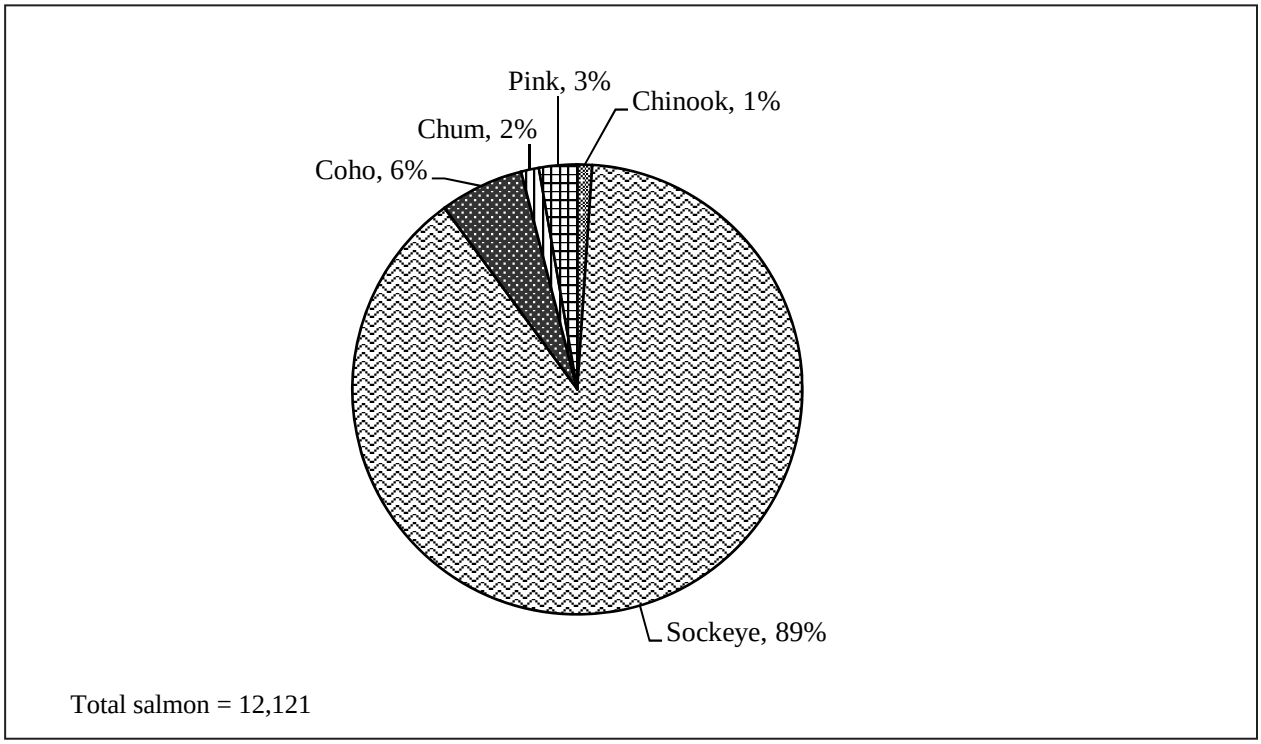

Figure 7-2.–Composition of Chignik Area subsistence salmon harvest by species, 2016.

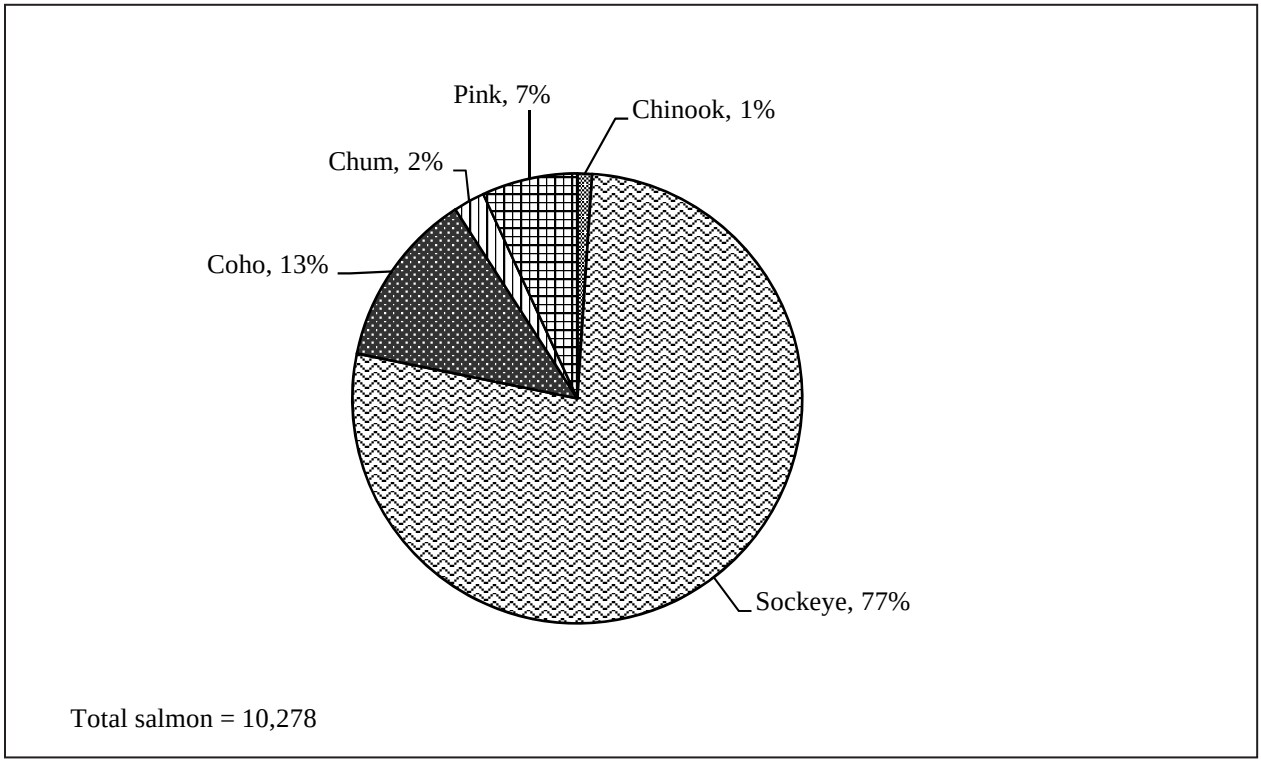

Figure 7-3.–Species composition of Chignik Area subsistence salmon harvests, 2011–2015.

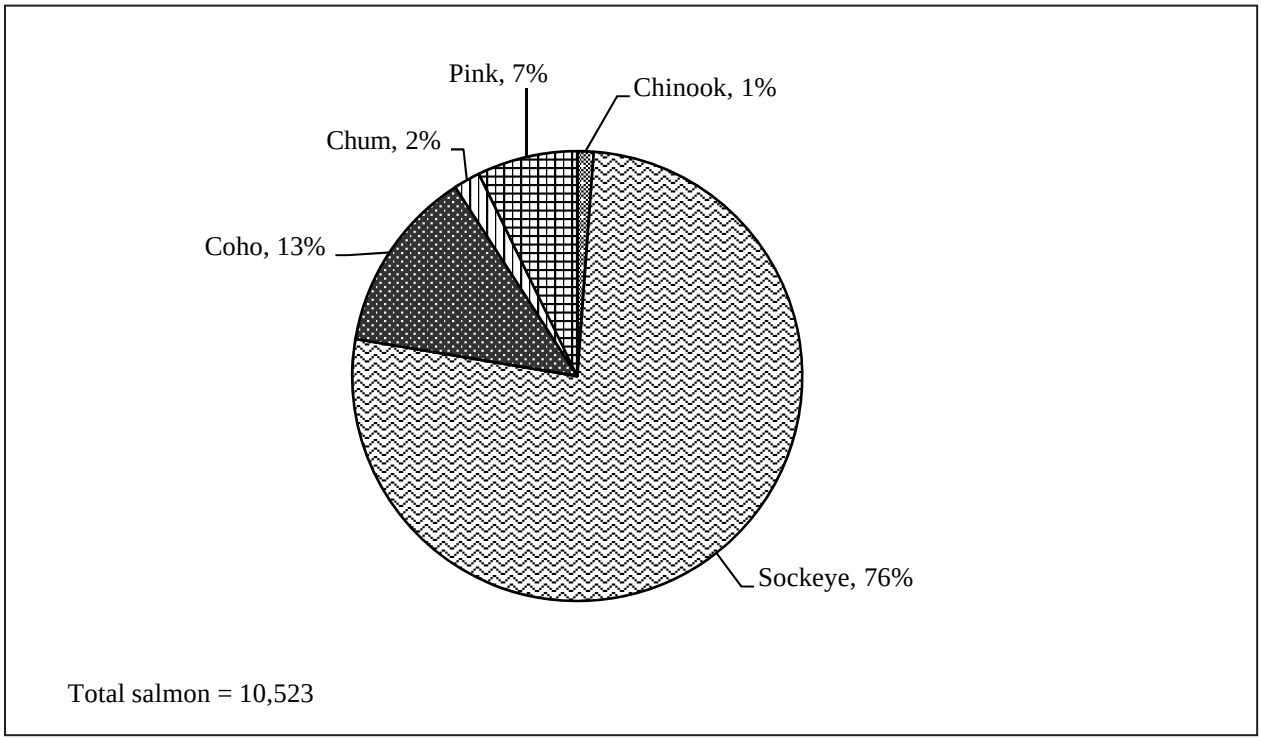

Figure 7-4.–Species composition of Chignik Area subsistence salmon harvests, 2006–2015.

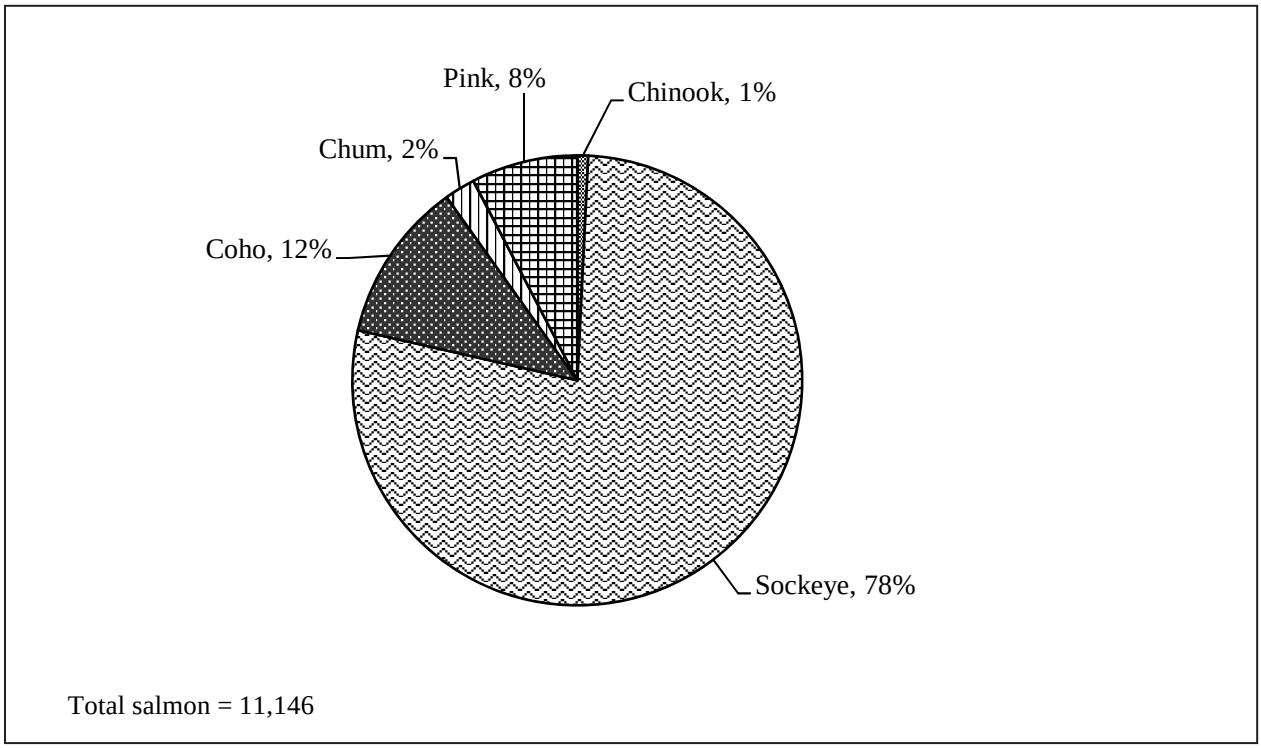

Figure 7-5.–Species composition of Chignik Area subsistence salmon harvests, 1977–2015.

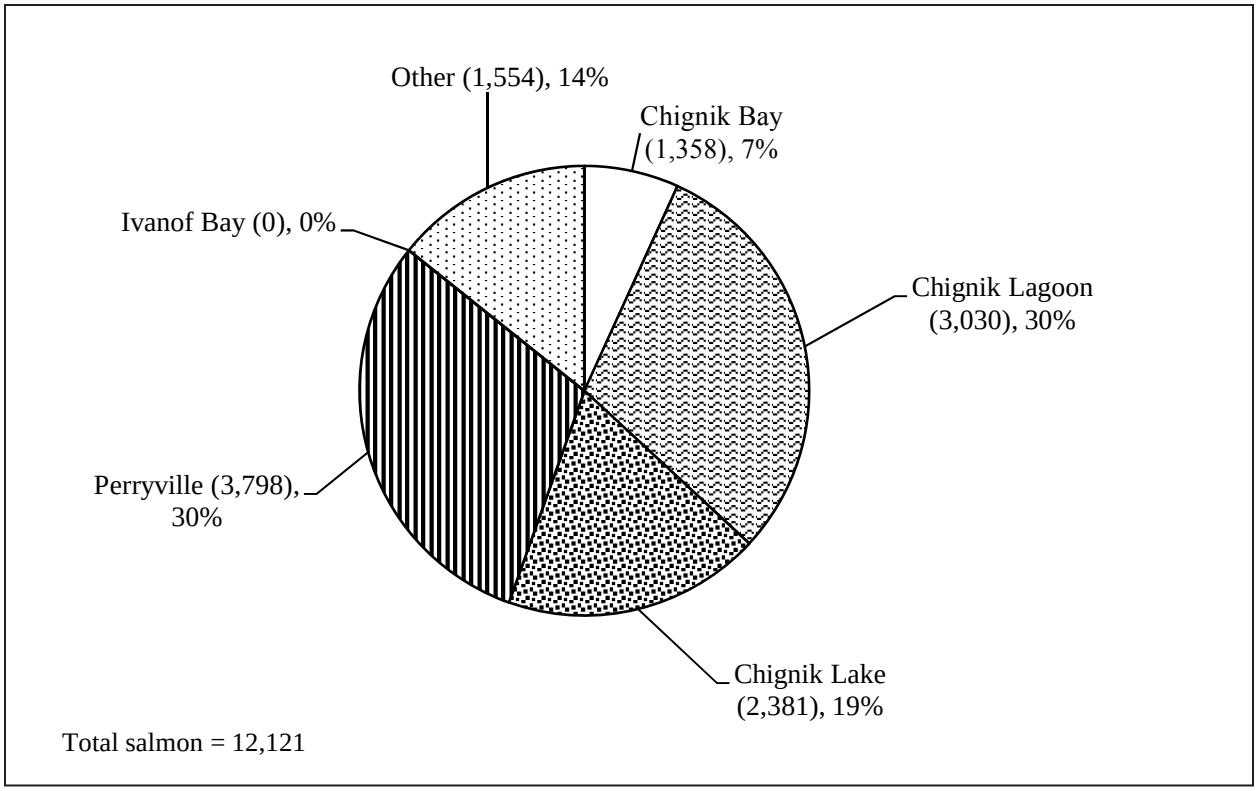

Figure 7-6.–Subsistence salmon harvests by community, Chignik Area, 2016.

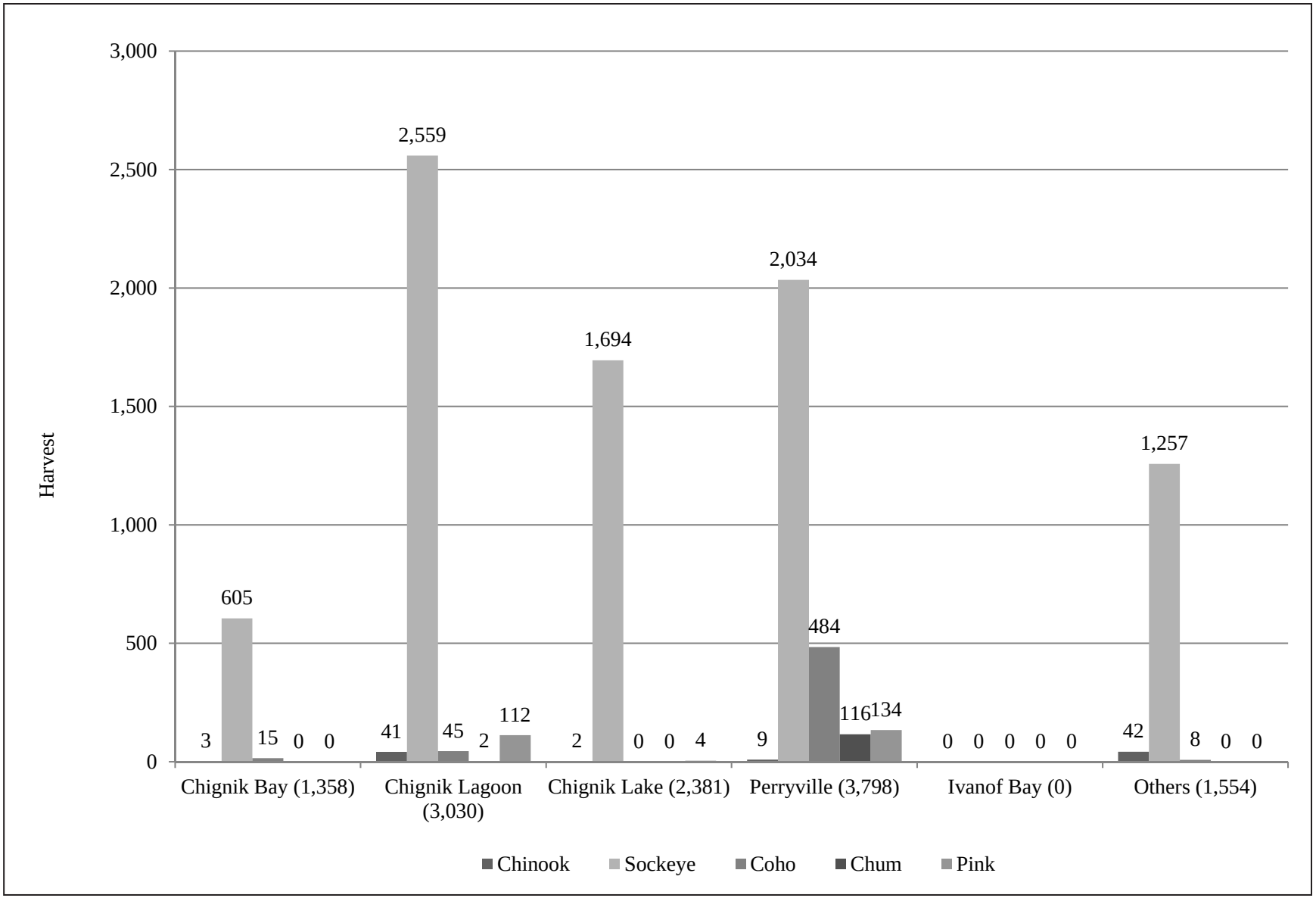

Figure 7-7.–Subsistence salmon harvests by community, Chignik Area, 2015.

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 2016 are Port Heiden (population 98), Nelson Lagoon (population 34), False Pass (population 42), Cold Bay (population 65), King Cove (population 916), and Sand Point (population 943).[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 three and one-half inches stretched measure. The first 25 meshes above the leadline must be seven 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.

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

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed October 4, 2018. http://live.laborstats.alaska.gov/pop/index.cfm

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 2016

From 1985 through 2015, the number of subsistence salmon permits issued for the Alaska Peninsula Area averaged 189 per year (Table 8-1). The recent 5-year average (2011–2015) was 168 permits. In 2016, 166 subsistence salmon fishing permits were issued for the Alaska Peninsula Area, which was an increase compared to the previous year when 158 permits were issued. This compares to the 236 Commercial Fishery Entry Commission (CFEC) permits issued for the commercial salmon fishery for the Alaska Peninsula Area in 2016 (Fox et al. 2017) . The response rate for subsistence permits was 76% in 2016 (126 of 166 permits were returned). Of all subsistence permits issued, 128 (77%) were issued to residents of Alaska Peninsula Area communities, and 38 (23%) were issued to residents of other Alaska communities (Table 8-2). Most nonlocal residents fish at Mortensens Lagoon, which is located approximately nine 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 2016 was 14,139 fish. This is a 32% decrease from the prior year (20,693 salmon in 2015), and slightly less than the recent 5-year (2011–2015) (14,139 salmon), but more than the 10-year (2006–2015) (13,645 salmon) average and less than the historical average (1985–2015) of 17,421 fish (Table 8-1). The 2016 subsistence harvest consisted of 73% sockeye salmon (10,287), 15% coho salmon (2,122), 5% pink salmon (703), 5% chum salmon 772), and 2% Chinook salmon (255) (Table 8-1; Figure 8-1).

Chinook salmon harvests increased compared to 2015 and the recent 5-year (2011–2015), and 10-year (2006–2015) average harvests but showed a decrease from the historical (1985–2015) average of 302 Chinook salmon. Chinook salmon harvests in 2016 totaled 255 fish, a 54%, 19%, and 13% increase from the previous year (117), previous 5-year (206), and 10-year (221) averages respectively, but a 16% decrease from the historical (1985–2015) average (Table 8-1).

With the exception of Chinook salmon, all estimated salmon harvests in 2016 decreased compared to the 2015 harvests with pink and sockeye salmon having the greatest decreases of 86% and 16% respectively. The 2016 pink salmon harvest (703) was less than the recent and historical averages, being a 64% decrease from the 5-year average (1,953); a 53% decrease from the 10-year average (1,484); and a 54% decline from the historical (1985–2015) average of 1,535 pink salmon (Table 8-1). The sockeye salmon harvest in 2016 (10,287) was a 15% decrease from 2015 harvest (12,107) but was a 9% increase from the 5-year average (9,400), a 18% increase from the 10-year average (8,443) and a 6% from the historical (1985–2015) average of 9,716 sockeye salmon (Table 8-1).The 2016 chum harvest (772) was less than the recent and historical averages, being a 32% decrease from the 5-year average (1,142); a 22% decrease from the 10-year average (990); and a 56% decline from the historical (1985–2015) average of 1,762 chum salmon (Table 8-1). The 2016 coho salmon harvest of 2,122 fish was close to the 5-year historical average of 2,033 with only a 4% increase; but had a 15% decline from the 10-year average (2,506); and a 48% decline from the 1985–2015 historical average (4,107).

Of the total salmon harvested in 2016, the residents of Sand Point harvested 39% (5,483 fish); King Cove residents 29% (4,086); Port Heiden 8% (1,175); Cold Bay residents 7% (1,080); Nelson Lagoon residents, 2% (400); and False Pass residents 2% (227). Other Alaska residents not residing year around in any of the Alaska Peninsula Management Area communities, harvested 1,687 salmon, which represented 12% of the total harvest for this area in 2016 (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 2016 reported removing a total of 3,433 salmon for personal use from their commercial salmon harvest, of which 64% (2,181) were chum salmon, 17% (574) sockeye salmon; 14% (464) Chinook salmon; 6% (214) coho salmon; and no pink salmon were removed. Commercial salmon fisherman in the North Alaska Peninsula reported removing a total of 58 salmon for personal use in 2016, of which 66% (38) were sockeye salmon and 34% (20) were Chinook 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 et al. 1993b) and 45% in Sand Point (Fall et al. 1993a), 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 et al. 1993b: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 et al. 1993b: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 et al. 1993a: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

Other Subsistence Fisheries

Subsistence Pacific halibut fishing harvest estimates for communities and tribes in the Alaska Peninsula Area are available for 2003–2012, 2014, and 2016 (Fall and Koster 2018). 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

2. Elizabeth Fox, ADF&G Area Management Biologist, Alaska Peninsula and Aleutian Islands, Personal Communication, October 17, 2018.

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 conducted systematic surveys for study year 2016 that include harvest data for a comprehensive list of resources as well as salmon sharing practices in Cold Bay, Sand Point, and King Cove.[3]

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).

3. For more information see Hutchinson-Scarbrough, L., J. M. Van Lanen, and M. L. Kostick. In prep. Harvest and Uses of Wild Resources in Cold Bay, King Cove, and Sand Point. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. NNN, Anchorage.

Table 8-1.–Historical subsistence salmon harvests, Alaska Peninsula Area, 1985–2016.

	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
2016	166	126	255	10,287	2,122	772	703	14,139
5-year average (2011–2015)	168	136	206	9,400	2,033	1,142	1,953	14,734
10-year average (2006–2015)	166	136	221	8,443	2,506	990	1,484	13,645
Historical average (1985–2015)	189	147	302	9,716	4,107	1,762	1,535	17,421

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 8-2.–Subsistence salmon harvest estimates by community, Alaska Peninsula Area, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Cold Bay	19	15	0	1,060	3	11	6	1,080
False Pass	1	1	2	45	180	0	0	227
King Cove	29	21	3	3,316	559	123	86	4,086
Nelson Lagoon	2	1	0	300	100	0	0	400
Port Heiden	27	27	131	656	360	11	17	1,175
Sand Point	50	33	103	3,505	820	564	492	5,483
Subtotal, area residents	**128**	**98**	**239**	**8,881**	**2,022**	**709**	**601**	**12,452**
Anchorage	15	12	3	404	15	21	46	489
Eagle River	1	0	0	0	0	0	0	0
Homer	8	6	0	285	85	41	53	465
Iliamna	1	1	0	0	0	0	0	0
Kasilof	1	0	0	0	0	0	0	0
Kenai	1	1	0	130	0	0	0	130
King Salmon	1	1	0	0	0	0	0	0
Kodiak	4	4	14	151	0	0	2	167
Kotzebue	1	1	0	195	0	0	0	195
North Pole	1	1	0	180	0	0	0	180
Seward	1	0	0	0	0	0	0	0
Sutton	1	1	0	61	0	0	0	61
Wasilla	2	0	0	0	0	0	0	0
Subtotal, other Alaska residents	**38**	**28**	**17**	**1,406**	**100**	**63**	**102**	**1,687**
Total	**166**	**126**	**255**	**10,287**	**2,122**	**772**	**703**	**14,139**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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

	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
Halibut	95	73	0	22	89
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.

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. ND No data for that resource.

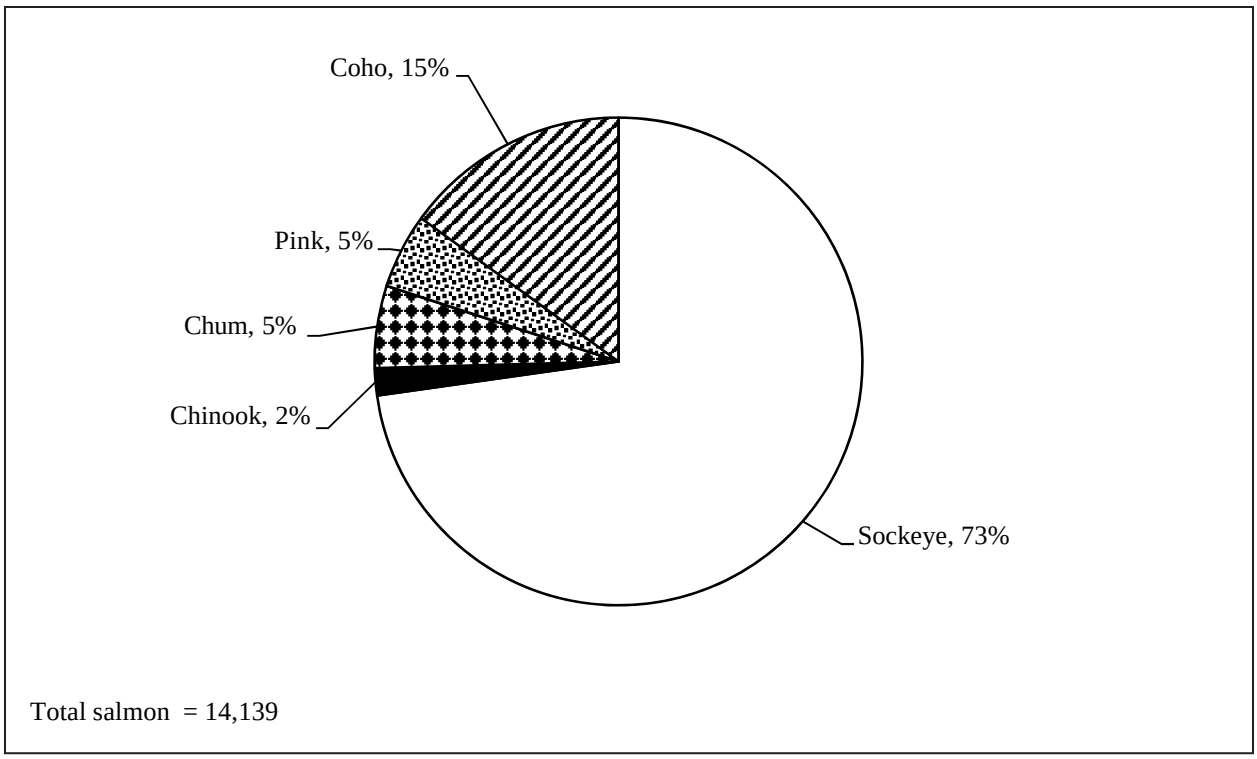

Figure 8-1.–Composition of Alaska Peninsula Area subsistence salmon harvest by species, 2016.

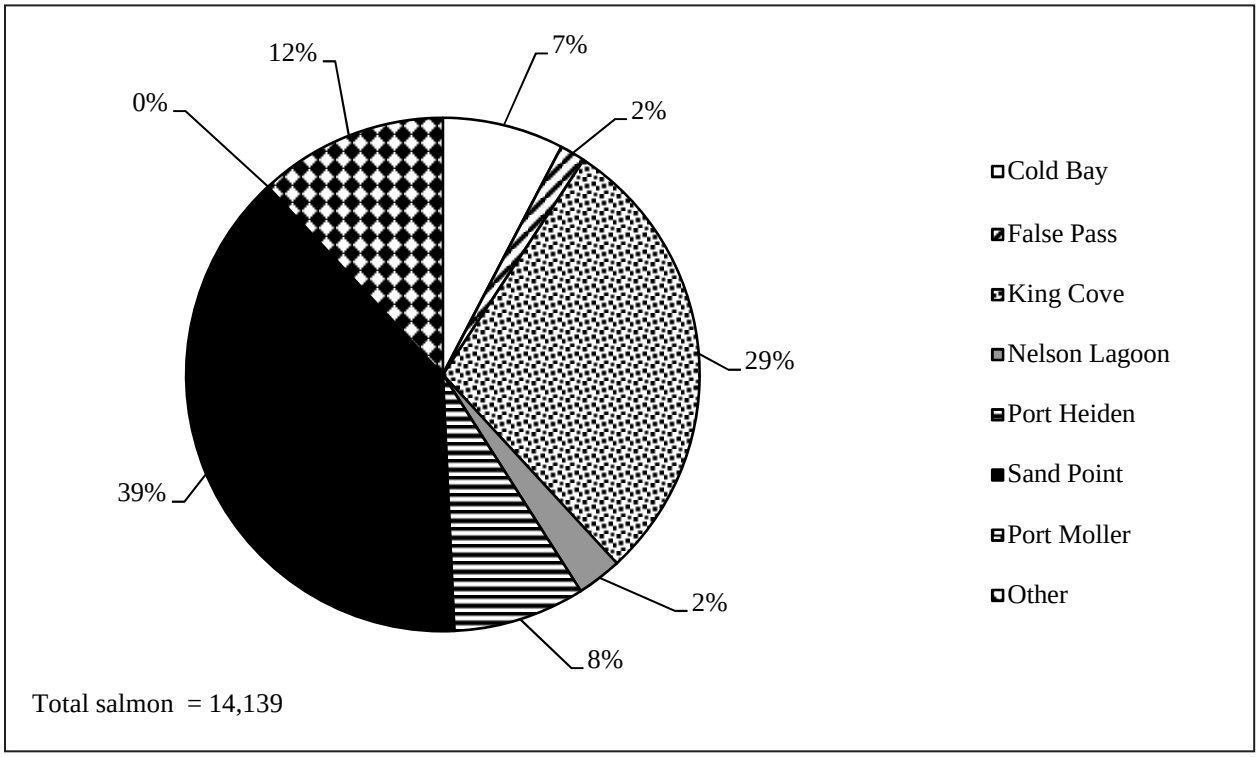

Figure 8-2.–Subsistence salmon harvests by community, Alaska Peninsula Area, 2016.

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 six 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 2016, the total Akutan population was estimated at 999; however, most of the people (937) were estimated as residing in group housing, and 62 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 2016, the estimated population of Unalaska–Dutch Harbor was 4,447 with 2,350 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 2016, the estimated population was 13. Atka in 2010 had a population of 61 residing in a total of 24 households; and the estimated population in 2016 totaled 65. Adak's 2010 census population totaled 326 people which 109 lived in a total of 44 households and 217 in group quarters; and in 2016, the estimated population was 309 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 2016, the population was estimated at 397 with 385 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 four residing in group quarters; and the 2016 population estimate was 72 people; four 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 Atka and Nikolski are based upon data in Davis (2005). There are no native populations of salmon in the Pribilof Islands, and

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed July, 2018. 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, 2018. 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, 2018. 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.

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 permanent residents residing in the Aleutian Islands Area; however they are managed consistently with the state fisheries in the region. [5]

Subsistence Salmon Harvests in 2016

In 2016, 255 subsistence salmon permits were issued for the Unalaska District, which was higher than the previous year, 2015, when 222 were issued, and lower than the recent 5-year (2011–2015) average of 233 permits but slightly higher than the 10-year (2006–2015) average of 217 permits issued (Table 9-1). This number was also higher than the historical annual average (1985–2015) of 177 permits issued. Harvest numbers are recorded on the permit and returned at the end of the harvest season to ADF&G. In 2016, the return rate for the Unalaska District was 69%, with 177 permits returned out of 255 permits issued. Dutch Harbor and Unalaska residents accounted for 237, or 93%, of all permits issued in the Unalaska District, and returned 163 permits out of 237 permits (70%) (Table 9-2).

The estimated subsistence harvest of salmon in the Unalaska District in 2016 was 6,231 fish, which was more than the previous year (4,459), and more than the recent 5-year average (5,134 fish) for the district

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).

(Table 9-1). The composition of the 2016 subsistence salmon harvest was sockeye (89%), coho (5%), pink (5%), 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 zero 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 2016 was 309 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.

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

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

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 2016, Adak District

In 2016, no subsistence salmon permits were issued for the Adak District. This was less than the one issued in the previous year, and less than the 5-year (2) and 10-year (3), and the historical 1988–2015 averages (15) (tables 9-3 and 9-4).

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 three 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 2016 (Fall and Koster 2018).

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 two 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, 1985–2016.

	Permits		Estimated salmon harvest					
Year	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
2016	255	177	40	5,538	320	35	298	6,231
5-year average (2011–2015)	233	173	8	4,353	372	43	359	5,134
10-year average (2006–2015)	217	161	8	3,507	430	68	459	4,472
Historical average (1985–2015)	177	127	7	3,157	591	69	859	4,683

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 9-2.–Estimated subsistence salmon harvests by community, Unalaska District, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Adak	1	1	0	0	0	0	0	0
Anchorage	4	4	0	0	0	0	0	0
Bethel	1	1	0	0	0	0	0	0
Big Lake	1	1	0	0	0	0	0	0
Chugiak	1	0	0	0	0	0	0	0
Dutch Harbor	114	79	1	2,274	117	6	76	2,475
Fairbanks	1	1	0	0	0	0	0	0
Homer	3	2	0	0	0	0	0	0
Juneau	1	1	0	0	0	0	0	0
Palmer	2	2	0	0	0	0	0	0
Unalaska	123	84	38	3,214	204	29	221	3,706
Wasilla	2	0	0	0	0	0	0	0
Wrangell	1	1	0	50	0	0	0	50
Total	**255**	**177**	**40**	**5,538**	**320**	**35**	**298**	**6,231**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 9-3.–Historical subsistence and personal use salmon harvests, Adak District, 1988–2016.

	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
2016	0	0	0	0	0	0	0	0
5-year average (2011–2015)	2	1	0	13	2	0	16	32
10-year average (2006–2015)	3	3	0	97	1	0	12	111
Historical average (1988–2015)	15	11	0	248	6	0	22	276

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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, Adak District, 2016.

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

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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

Community	Year	Estimated number of harvesting households	Estimated salmon harvest[a]						
			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
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).

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

NA The estimated number of harvesting households cannot be calculated using available data.

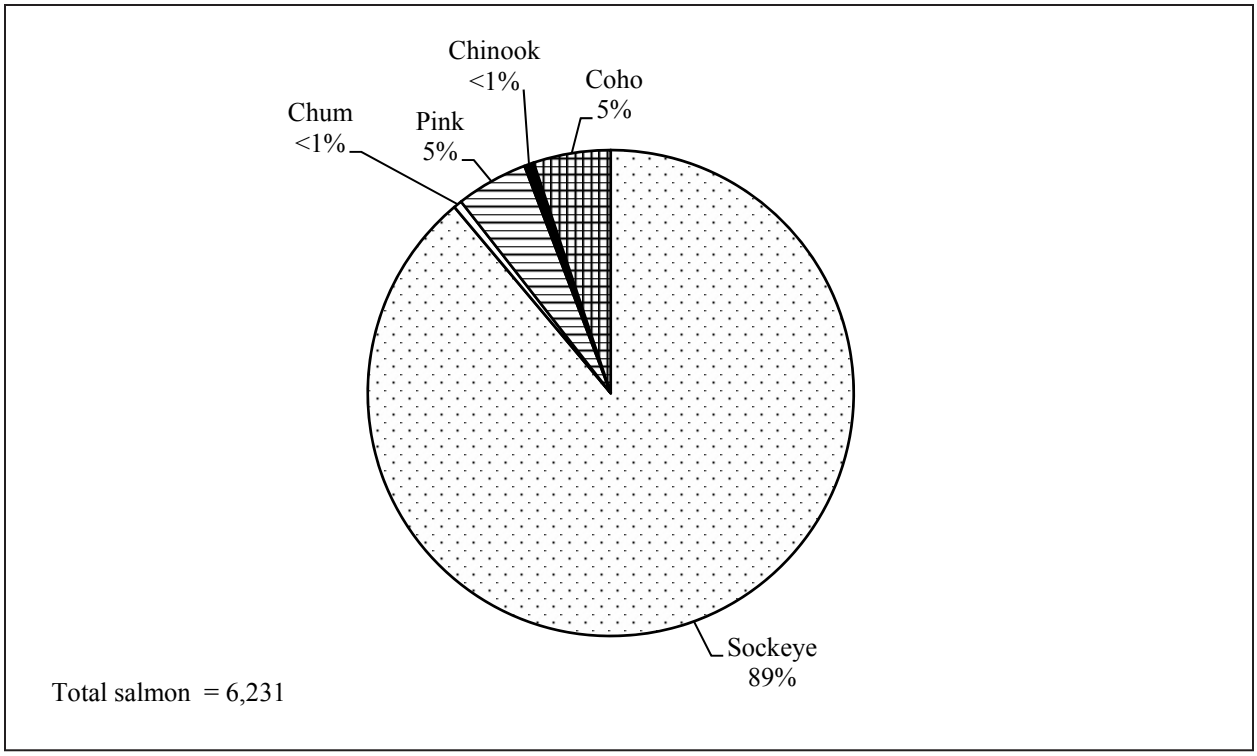

Figure 9-1.–Composition of Unalaska District estimated subsistence salmon harvest by species, 2016.

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 (13,560 in 2016) 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 (6,123), the Kodiak Station (U.S. Coast Guard base) 1,302), Womens Bay (761), Chiniak (46), 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) (4,543). 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 it must be noted that Chiniak uses its own postal code. Communities (and their populations) within the Kodiak Island Borough that are located off the road system include Akhiok (97), Aleneva CDP (22), Karluk (24), Larsen Bay (76), Old Harbor (231), Ouzinkie (159), and Port Lions (176).[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. 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 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. 2016a).

In 2016, legal gear for subsistence salmon fishing in the Kodiak Area 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.

The entire Kodiak Management Area is generally open to subsistence salmon fishing. The freshwater systems of Afognak Island—because they are small, easily accessible, and at risk of overexploitation—and some areas near heavily exploited salmon systems are closed to subsistence fishing by regulation (5 AAC 01.525) (Anderson et al. 2016b).

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. http://live.laborstats.alaska.gov/pop/index.cfm.

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. If the department projects that the biological escapement goal for king salmon in 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).

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 or reduce 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. 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 2016, as in 2015, the Afognak Lake sockeye salmon run was strong, and on June 3 the normally closed waters were reduced to allow for more effective subsistence and commercial harvests and to prevent overescapement of sockeye salmon into Afognak Lake.[2] Additionally, inseason the department temporarily increased closed waters around Pasagshak Bay from July 2 until July 14.[3,4] To ensure Chinook salmon broodstock collection at Monashka Creek, Chinook salmon could not be retained in the subsistence fishery in an area of Monashka/Mill Bay.

In 2016, 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. A list of federal public waters closed to subsistence salmon fishing in the Kodiak area is available in the 2015–2017 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.[5] 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.

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. Over the years, a consistent challenge for the this 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 10-1). 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

2. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/662455839.pdf accessed August 23, 2018
3 http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/684913393.pdf accessed August 23, 2018
4 http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/701533824.pdf accessed August 23, 2018
5. 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, 2015–March 31, 2017." Federal Subsistence Board, Office of Subsistence Management, Accessed August 28, 2018. https://www.doi.gov/sites/doi.gov/files/migrated/subsistence/regulation/fish_shell/upload/web-2015-2017-Fish-Regs-Book.pdf .

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 not for sale (AAC39.010b) and must be reported on an ADF&G fish ticket at the time of landing (5 AAC 18.355(b). This is often referred to as "home pack." More information on the harvest and use of "home pack" and rod and reel-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 six 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 2016

In 2016, a total of 1,512 subsistence permits with harvest information were returned to ADF&G (tables 10-1 and 10-2). Of these, 1,250 (83%) were returned by residents of the Kodiak Island Borough, 261 (or 17%) were returned by residents of other Alaska communities, and one (<1%) had been issued to Alaska residents who were serving in the military outside of the state (Table 10-2).

The total reported subsistence salmon harvest for the Kodiak Area in 2016 was 24,179 fish, which is about 17% lower than the recent 5-year (2011–2015) and 10-year (2006–2015) averages of 29,139 salmon and 29,156 salmon, respectively (Table 10-1). Of the total harvest, 23,290 salmon (or 96%) were harvested by residents of Kodiak Island Borough communities. This was an increase from the 19,480 salmon reported harvested in these communities in 2015. More specifically, residents living along the Kodiak Island road system (Kodiak city and Chiniak) harvested 18,078 salmon (75% of total) (Figure 10-2). In comparison, the six villages and other populated remote locations that do not have access to the road system surrounding

Kodiak City harvested 5,212 salmon (22%) in 2016 (Table 10-2, Table 10-3). Permit holders from other Alaska communities harvested 889 salmon (or 4% of the total).

In 2016, the Kodiak Area subsistence salmon harvest was composed of 20,902 (86%) sockeye salmon, 2,267 (9%) coho salmon, 715 (3%) pink salmon, 160 (1%) chum salmon, and 135 (1%) Chinook salmon (Figure 10-3; Table 10-1). The reported sockeye salmon harvest in 2016 was 30% more than the previous year's reported sockeye salmon harvest of 16,053 fish but 16% less than the recent 5-year average and 12% less than the recent 10-year average. The 2016 coho salmon harvest was 26% less than the 2015 reported harvest of 3,057 fish and 23% less than the recent 5-year average, but 42% lower than the recent 10-year average of 3,916 fish. The chum salmon reported harvest in 2016 was 41% lower than the 2015 harvest of 271 fish, 20% lower than the recent 5-year average and 30% lower than the 10-year average. The pink salmon reported harvest in 2016 was 39% lower than the 2015 harvest of 1,168 fish, as well as significantly lower than the recent 5-year and 10-year averages. Chinook salmon reported harvests in 2016 were lower than year prior of 186 fish as well as the recent 10-year average of 162 fish, but about the same as the recent 5-year average of 133 fish (Table 10-1).

According to Anderson et al. (2016b), historically the most-utilized harvest areas for subsistence salmon fisheries in the Kodiak Management Area 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).

Records received from the Kodiak National Wildlife Refuge office indicate that in 2016, a total of 51 federal permits were issued, an increase of 32 permits from 2015. The total 2016 reported harvest from 42 returned permits was 245 fish with 168 sockeye salmon, 65 coho salmon and 13 Chinook salmon. Reported sockeye harvests in 2016 indicated a noticeable increase from the 2015 harvest of 53 sockeye salmon harvested in 2015 but was similar to the 2014 harvest of 139 sockeye salmon[6] (Table 10-4).

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 six communities. A total of 100 permits were returned in 2000; from 2001 through 2007 between 189 and 143 permits were returned (Table 10-3). The yearly reported subsistence salmon harvests during this time were generally higher. Since 2008, the number of returned permits from these communities has not exceeded 125. In fact, the most recent years of 2012–2016 have marked the lowest reported salmon harvests recorded since 2000 (Table 10-3). In 2016, the 99 permits returned by the six villages is the closest to data for 2000, prior to the implementation of efforts detailed above. In 2016, a limited local vendor program with the Tribal Councils was in place in Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions. The Kodiak office contacts the tribal councils each year to ensure they have enough permits, regulation booklets, and to obtain a list of individuals who received a permit the previous year.[7] 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 (Marchioni et al. 2016), no additional outreach efforts have occurred in the small communities on Kodiak Island since 2014.

6. Lauren Sill, Division of Subsistence, Subsistence Resource Specialist, personal communication with Cinda Childers, August 24, 2018.
7. Lauren Sill, Division of Subsistence, Subsistence Resource Specialist, personal communication with Amanda Dorner, Division of Commercial Fisheries, Kodiak office, August 28, 2018.

Retention of Salmon Taken in Commercial Fisheries in 2016

In 2016, 63 commercial fishermen in the Kodiak Management Area reported on fish tickets that they retained for personal or home use a total of 5,427 salmon from their commercial harvests (Table 10-5). This included 239 Chinook salmon, 3,270 sockeye salmon, 1,175 coho salmon, 571 pink salmon, and 172 chum salmon. The composition of retained harvests in 2016 was similar to the subsistence fishery in that sockeye salmon constituted the greatest percentage (60%), followed by coho salmon (22%), pink salmon (11%), Chinook salmon (4%), and chum salmon (3%) (Figure 10-4; Table 10-5). However, this represents a smaller percentage of sockeye salmon and a higher percentage of the other salmon species.

Commercial fishermen retained 45% less fish from their commercial harvests in 2016 than they did in 2015, 46% less fish than the recent 5-year average, and 29% less fish than the 10-year average (Table 10-5). More fishermen reported retaining fish for home and personal use than the 5- and 10-year average, but fewer than in 2015. The decrease in retained fish between 2015 and 2016 largely comes from an 86% decrease in retained pink salmon and 77% reduction in retained chum salmon. Fishermen have not reported such a low amount of retained pink salmon since 2008.

Other Subsistence Fisheries in the Kodiak Area

Finfishes

In the Kodiak Area, a permit is also required to fish for herring, trout, char, or crab (5 AAC 01.530; 5 AAC 02.405); only one permit is issued through the Kodiak ADF&G office and applies to all the required species. The permit has space for a person to record harvests of salmon, herring, and crab, but reporting of trout and char is not required. In 2016, 1,800 lb of herring was reported on subsistence permits, which was slightly higher than the 2015 herring harvest of 1,515 lb, but was still one of the lowest reported harvests on record. The 2016 reported harvest was 45% lower than the recent 10-year average (2006–2015). 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 01.510; 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); 2014 (Fall and Lemons 2016); and 2016 (Fall and Koster 2018). Due to a reduction 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. 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 each Kodiak Island Borough community. Fish harvested in the largest quantities and used by the majority of households include Pacific cod, lingcod, various species of flounders, Pacific halibut, rockfishes, and Arctic char/Dolly Varden.

Shellfish

Kodiak Island residents harvest a variety of shellfish, including crab, clams, cockles, mussels, chitons, octopuses, sea urchins, and others, but regulations only concern the harvest of Dungeness, Tanner, and king crab. Regulations require catch reporting on a subsistence permit and establish sex, size, bag and possession limits, and gear limits and requirements for all species of crabs as well as seasons for king crab fishing. In 2016, a total of 3,237 crab were reported on subsistence permits, of which 212 were king crab, 591 were Dungeness crab, and 2,434 were Tanner crab. The total crab harvest in 2016 was significantly less than the 2015 combined harvest of 4,118 crab (Table 10-6). King and Dungeness harvests did not change substantially, but the harvest of tanner crab reported in 2016 was 900 crab less than in 2015. The 2016 reported harvest continues a decline in numbers of permits reporting crab harvest and total number of crabs that has been observed since 2011; 2016 reported the lowest number of permits (tied with 1999) and the lowest harvest of crab since 1995.

Table 10-1.—Historical subsistence salmon harvests, Kodiak Area, 1986–2016.

	Permits		Reported salmon harvest[a]					
Year	Issued	Returned	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
2016	ND	1,512	135	20,902	2,267	160	715	24,179
5-year average (2011–2015)	ND	1,752	133	24,866	2,957	199	984	29,139
10-year average (2006–2015)	ND	1,805	162	23,662	3,916	230	1,185	29,156
Historical average (1986–2015)	ND	1,545	235	23,127	5,510	405	1,485	30,762

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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.

Table 10-2.—Reported subsistence salmon harvests by community and species, Kodiak Area, 2016.

Community	Permits returned	Reported salmon harvest[a]					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Kodiak Island Borough							
Akhiok	6	0	485	72	0	65	622
Chiniak	21	1	203	36	6	2	248
Karluk	6	0	455	2	0	0	457
Kodiak (city)	1,130	101	15,730	1,441	91	467	17,830
Larsen Bay	18	4	944	15	4	0	967
Old Harbor	17	2	531	253	42	48	876
Ouzinkie	24	4	1,033	334	8	54	1,433
Port Lions	28	10	682	100	0	65	857
Subtotal, Kodiak Island Borough	**1,250**	**122**	**20,063**	**2,253**	**151**	**701**	**23,290**
Other Alaska							
Anchor Point	3	0	0	0	0	0	0
Anchorage	97	10	397	13	4	8	432
Bettles	1	0	0	0	0	0	0
Big Lake	2	0	0	0	0	0	0
Cantwell	1	0	0	0	0	0	0
Central	1	0	0	0	0	0	0
Chickaloon	0	0	0	0	0	0	0
Chugiak	4	0	45	1	0	0	46
Cold Bay	1	0	54	0	0	0	54
Copper Center	1	0	0	0	0	0	0
Cordova	2	0	0	0	0	0	0
Eagle River	18	0	38	0	0	0	38
Fairbanks	12	0	16	0	3	6	25
False Pass	1	0	0	0	0	0	0
Fort Wainwright	1	0	0	0	0	0	0
Fritz Creek	1	0	0	0	0	0	0
Girdwood	5	0	0	0	0	0	0
Haines	1	0	0	0	0	0	0
Homer	24	0	122	0	2	0	124
Houston	1	0	0	0	0	0	0
Juneau	5	3	73	0	0	0	76
Kasilof	5	0	0	0	0	0	0
Kenai	4	0	0	0	0	0	0
Nikiski	1	0	0	0	0	0	0
Nikolai	1	0	0	0	0	0	0
Ninilchik	3	0	0	0	0	0	0
Palmer	13	0	0	0	0	0	0
Seldovia	4	0	0	0	0	0	0
Seward	5	0	0	0	0	0	0
Sitka	1	0	0	0	0	0	0
Soldotna	20	0	0	0	0	0	0
Sterling	2	0	0	0	0	0	0
Sutton	1	0	0	0	0	0	0
Talkeetna	2	0	0	0	0	0	0

-continued-

Table 10-3.–Page 2 of 2.

Community	Permits returned	Reported salmon harvest[a]					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Thorne Bay	1	0	0	0	0	0	0
Valdez	1	0	55	0	0	0	55
Wasilla	15	0	39	0	0	0	39
Subtotal, other Alaska	**261**	**13**	**839**	**14**	**9**	**14**	**889**
Other USA[b]	1	0	0	0	0	0	0
Total	**1,512**	**135**	**20,902**	**2,267**	**160**	**715**	**24,179**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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 10-3.–Permits returned and salmon harvests reported by the communities of Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions.

Year	Permits returned	Reported salmon harvest	Source
2000	100	6,299	(Fall et al. 2002:105)
2001[a]	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 10-2
2011	125	5,786	Table 10-2
2012	112	4,939	Table 10-2
2013	98	4,798	Table 10-2
2014	106	4,690	Table 10-2
2015	95	4,286	Table 10-2
2016	99	5,212	Table 10-2

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

a. Local permit vendor program and outreach efforts implemented in 2001.

Table 10-4.–Federal subsistence salmon harvests by community, Kodiak Area, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Kodiak (city)	51	42	13	168	65	0	0	246
Total	**51**	**42**	**13**	**168**	**65**	**0**	**0**	**246**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 10-5.–Retention of salmon taken in commercial salmon fisheries but not sold, by species, for the Kodiak Management Area, 1997–2016.

		Salmon harvest[a]					
Year	Permits	Chinook	Sockeye	Coho	Chum	Pink	Total
1997	10	7	678	91	2	6	784
1998	4	8	26	9	0	0	43
1999[b]							
2000[b]							
2001	9	16	465	1,215	33	0	1,729
2002	33	57	5,447	7,542	0	566	13,612
2003[c]	36	72	11,025	12,310	86	1,492	24,985
2004	13	8	3,052	290	10	253	3,613
2005	16	54	4,432	811	11	4,385	9,693
2006	31	100	1,442	2,786	128	1,140	5,596
2007	13	26	1,577	520	8	2,246	4,377
2008	19	76	2,513	681	0	0	3,270
2009	23	49	1,393	936	6	1,002	3,386
2010	42	160	2,330	2,976	15	6,267	11,748
2011	57	161	1,314	2,009	67	6,390	9,941
2012	57	195	4,116	1,971	31	1,413	7,726
2013	64	592	3,032	1,164	1,067	5,721	11,576
2014	77	189	3,371	2,230	18	3,035	8,843
2015	70	293	3,231	1,551	740	4,008	9,823
2016	63	239	3,270	1,175	172	571	5,427
5-year average (2011–2015)	59	259	2,833	2,070	240	4,565	9,967
10-year average (2006–2015)	40	160	2,552	1,608	135	3,160	7,616
Historical average (1997–2015)	32	111	2,888	2,346	93	2,120	7,558

Source ADF&G fish ticket database.

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 passed a regulation clearly stating that these fish were not to be sold or bartered (5 AAC 39.010).

Table 10-6.–Historical subsistence crab harvests, Kodiak Area, 1995–2016.

	Permits		Reported crab harvest[a]			
Year	Issued	Returned	King	Tanner	Dungeness	Total
1995	1,935	1,191	2,603	2,478	1,817	6,898
1996	1,556	1,297	513	2,181	1,552	4,246
1997	2,081	1,572	292	2,764	1,667	4,723
1998	1,816	543	217	2,260	1,516	3,993
1999	ND	182	177	2,875	1,510	4,562
2000	ND	242	215	5,311	1,324	6,850
2001	ND	497	323	9,180	1,476	10,979
2002	ND	362	305	6,843	2,295	9,443
2003	ND	406	322	7,211	3,838	11,371
2004	ND	437	459	8,757	2,615	11,831
2005	ND	424	440	7,736	3,074	11,250
2006	ND	383	394	6,517	2,692	9,603
2007	ND	304	298	4,765	2,192	7,255
2008	ND	281	360	4,124	1,844	6,328
2009	ND	330	406	6,210	1,992	8,608
2010	ND	410	339	8,498	2,520	11,357
2011	ND	390	264	9,645	2,115	12,024
2012	ND	257	220	5,727	721	6,668
2013	ND	255	199	5,252	613	6,064
2014	ND	227	181	4,177	780	5,138
2015	ND	204	215	3,367	536	4,118
2016	ND	182	210	2,434	574	3,218
5-year average (2011–2015)	ND	267	216	5,634	953	6,802
10-year average (2006–2015)	ND	304	288	5,828	1,601	7,716
Historical average (1995–2015)	ND	485	416	5,518	1,842	7,777

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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.

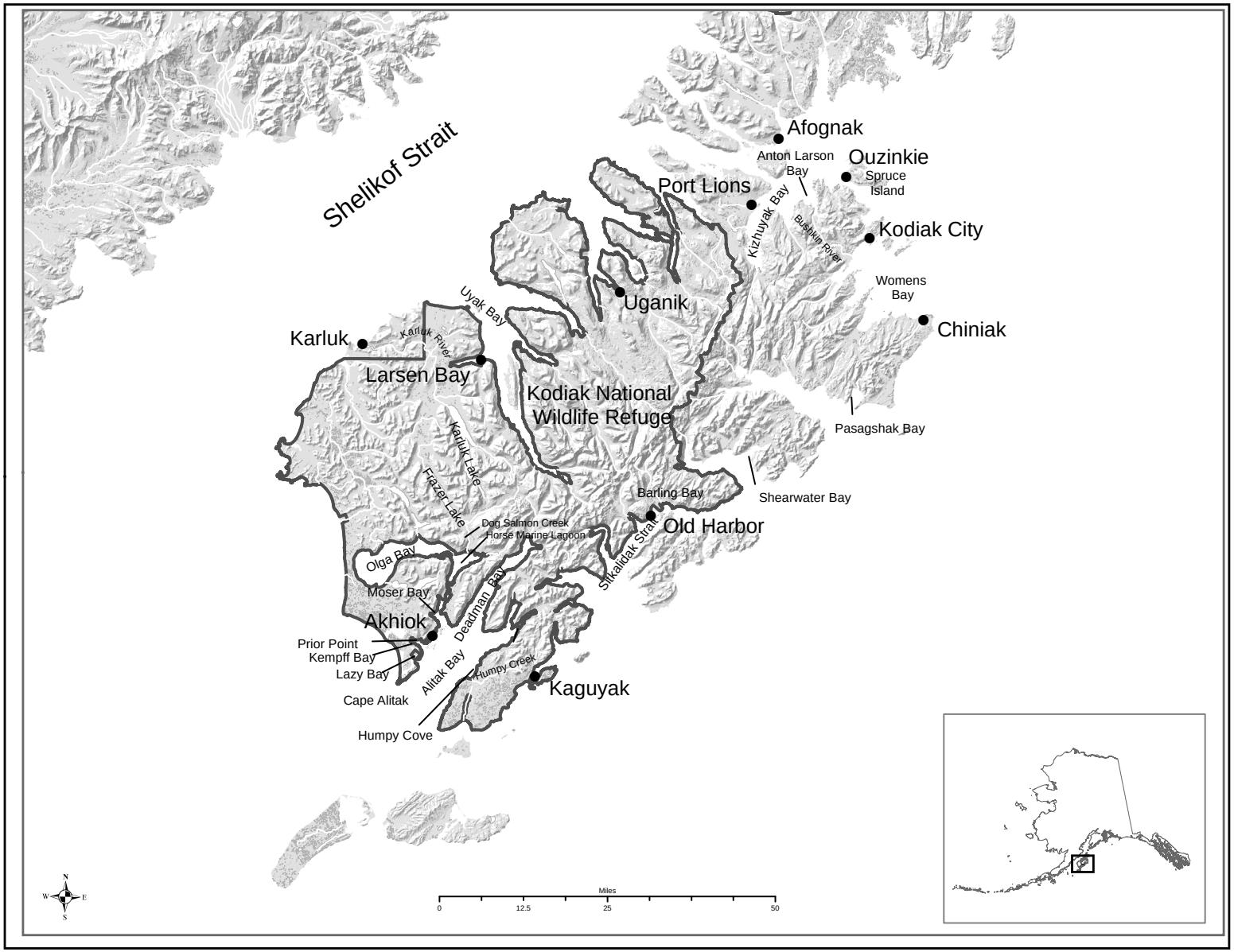

Figure 10-1.–Kodiak Area map.

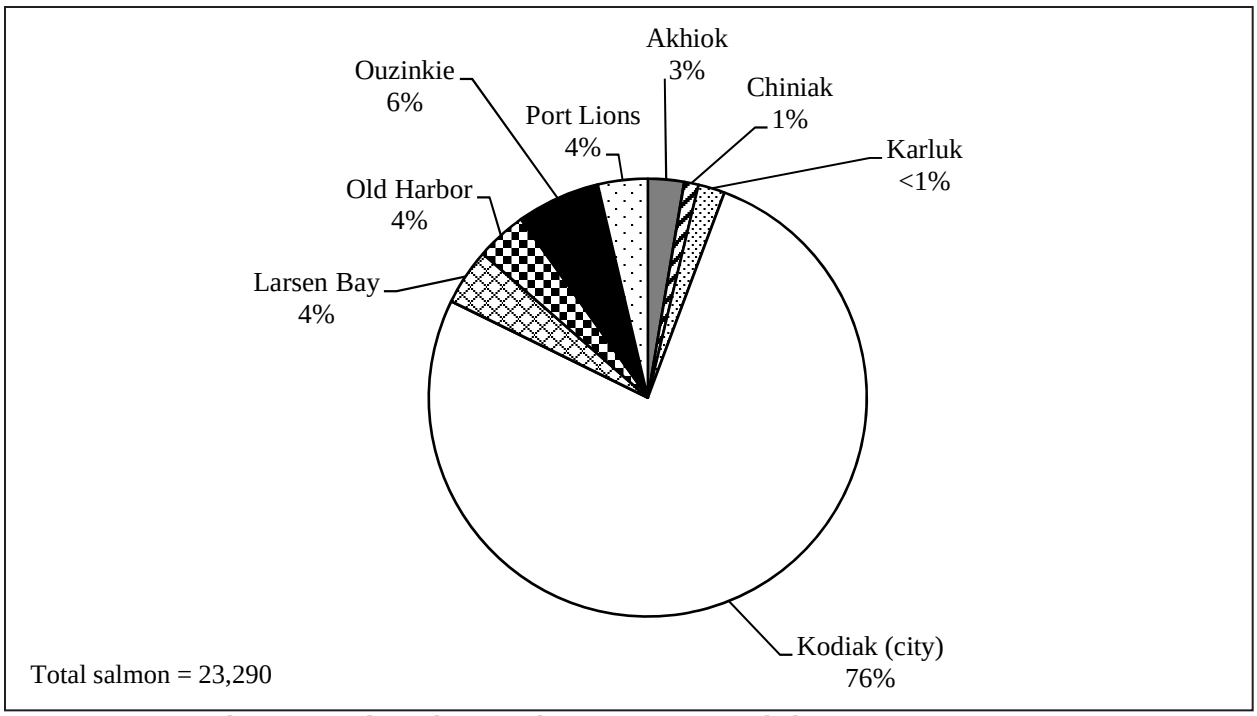

Figure 10-2.–Subsistence salmon harvests by community, Kodiak Area, 2016.

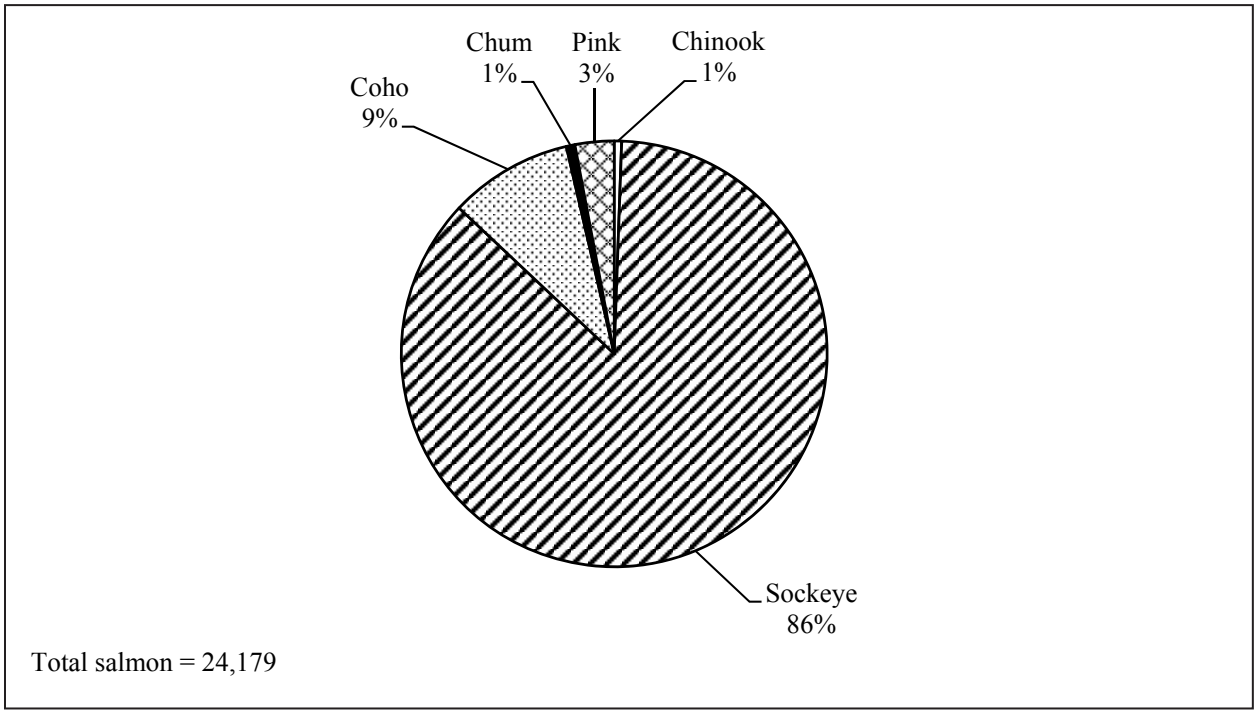

Figure 10-3.–Composition of Kodiak Area subsistence salmon harvest by species, 2016.

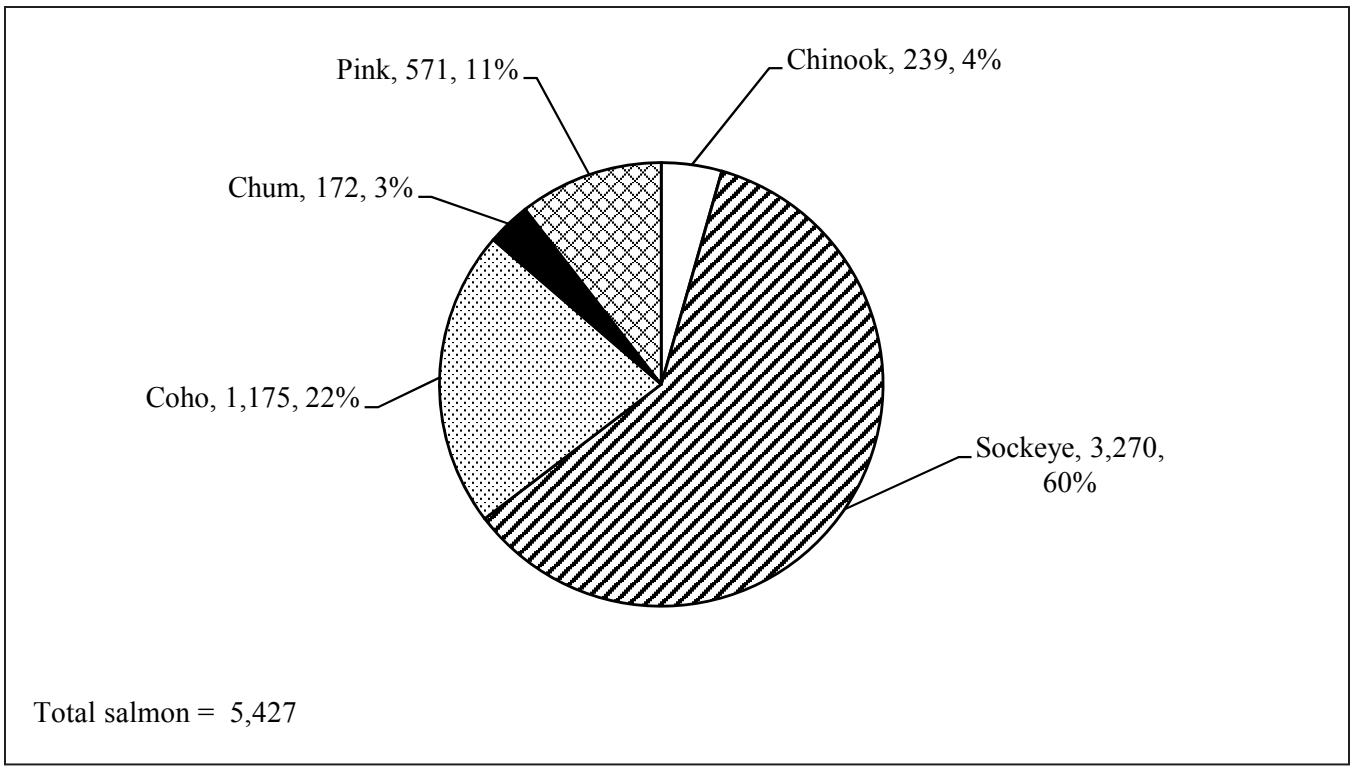

Figure 10-4.–Salmon retained from commercial harvests for home use, Kodiak Area, 2016.

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 their 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 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 2016), Tyonek (population 182), Beluga (population 16), Seldovia (population 381 in the city and village CDP), Port Graham (population 167), and Nanwalek (formerly called English Bay, population 300). The population of the entire Cook Inlet area in 2016 was 459,540, including the Municipality of Anchorage (population 298,937), the Kenai Peninsula Borough (58,049), and the Matanuska-Susitna Borough (102,554). This represented 62% of the state's total population in 2016.[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 three 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-inch stretched mesh. Returns of sockeye salmon, which are a majority of the harvest in the 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 surpassed the inriver goal (Hollowell et al. 2012:5). In 2012, the return

1. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed July 2018. http://live.laborstats.alaska.gov/pop/index.cfm

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. In 2016 a total of 620 sockeye salmon were reported harvested (Table 11-1).

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 summarizing 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. Up until 2013, when permits were issued, a separate monthly harvest calendar was also issued for recording daily harvests. In 2013 this changed, and the Division of Commercial Fisheries began issuing only a permit on which daily harvests are to be recorded and returned to the Fish and Game office in Homer at the end of the fishing season.

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 nine 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 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 2017)[2].

Harvest Estimates for 2016

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 discontinued by Commercial Fisheries and instead the permits were sent to the IRA councils for distribution.

In 2016, estimated salmon harvests for home uses in the Port Graham and Koyuktolik subdistricts totaled 1,595 salmon, including both subsistence setnet and reported rod and reel harvests (Table 11-1). The 2016 harvest was lower than the previous year (2,371 salmon), and a major decrease from the historical average of 5,148 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 2016, the number of permits issued was not recorded; however of those Port Graham residents who did obtain a permit, 12 returned permits and harvested 72 salmon (Table 11-2). Similarly, in Nanwalek the number of permits issued was not recorded, and 20 residents returned permits, reporting a harvest of 1,523 salmon, a decrease from 218 salmon in 2014, when two permits were returned (Table 11-2). As shown in

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

Table 11-2 and Figure 11-2, the combined harvest of the two communities of Nanwalek and Port Graham in 2016 included 620 coho salmon, the species with the highest harvest (44% of the overall harvest), closely followed by sockeye salmon (620; 39%), chum salmon (239; 15%), pink salmon (22; 1%), and Chinook salmon (17; 1%). Sockeye salmon harvests decreased from 877 salmon in 2015 to 620 salmon in 2016. Coho salmon harvests increased from 47 salmon in 2015 to 697 salmon in 2016; this may be explained by an increased effort because of the decreased sockeye harvest in 2016.

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 two 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-inch 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 two 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 2016 Season

There were four permits issued for the Seldovia subsistence fishery in 2016; all were returned (Table 11-3). The estimated harvest was 53 sockeye salmon (84% of the overall harvest), seven Chinook salmon (11%), two pink salmon (3%), one chum salmon (2%) and no coho salmon harvest (Figure 11-3). All four permits that were issued in 2016 were issued to residents of Seldovia (Table 11-3).

Total salmon harvests in 1998 through 2005 were higher than the first two 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, four harvested in 2008, 15 harvested in 2009, three harvested in 2010, and no harvests in 2011. The year 2012 marked an increase with eight Chinook salmon harvested, but then in 2013 the Chinook harvest decreased to three 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. However, in 2016, the Chinook harvest decreased to seven salmon. Since the extension of fishing time in 1998, the 2016 season resulted in the lowest harvest estimate on record for total salmon harvested. The 2016 harvest was less than the 5-year (2011–2015) average of 169 salmon and 10-year (2006–2015) average of 188 salmon, and less than the historical average of 235 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 two 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 six inches. 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.

Prior to the 2015 annual salmon report, the 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. Beginning in 2015 and continuing into the future, all salmon harvests are harvest estimates that are 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 2016 Season

In 2016, 74 permits were issued for the Tyonek Subdistrict subsistence salmon fishery, including 57 permits issued to Tyonek residents (77%) and 17 permits were issued to other Alaska residents, including 10 to residents of Anchorage (14%; Table 11-5). Residents of Tyonek accounted for 82% of the estimated harvest total (1,192 salmon), including 80% of the estimated Chinook salmon harvest (825 Chinook salmon) (Table 11-5).

3. For more detailed information about reported and estimated harvest numbers see Jones, B. E. and D. Koster. 2018. 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.

The 2016 estimated harvest of 1,462 salmon was lower than the 2015 harvest of 2,165 salmon and lower than the historical average of 1,833 salmon. The 2016 harvest was slightly higher than the 2011 harvest of 1,107 salmon, which was the fourth lowest estimated harvest since 1980 (Table 11-6). Of the total estimated subsistence salmon harvest in 2016, 1,030 were Chinook salmon (70%), 225 were coho salmon (15%), 188 were sockeye salmon 13%), 12 were pink salmon (1%), and eight were chum 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 one 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 2016

In 2016, 26 subsistence permits were issued for the Yentna River subsistence fish wheel fishery, and 25 were returned (Tables 11-7 and 11-8). In 2016, 12 of the 26 permit holders resided in the Skwentna area (46%), with the remaining 14 permits held by residents of other Cook Inlet area communities (Figure 11-5). Permit holders living in the community of Skwentna in 2016 harvested 413 of the estimated 790 salmon, or 52% of the harvest (Table 11-7).

Of the total harvest of 790 salmon estimated for 2016, 514 were sockeye salmon (65%), 204 coho salmon (26%), 37 chum salmon (5%) and 36 pink salmon (5%), (Figure 11-6). There were no reported harvests of Chinook salmon nor is it legal to retain the harvest. The 2016 harvest of 790 salmon was lower than the 2015 harvest of 845 salmon. The 20165 harvest was more than the 5-year average of 621 salmon, more than the 10-year average of 558 salmon, and also more than the historical average of 565 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 2016, the total harvest in the federal fishery on the Kenai and Kasilof rivers was 2,514 salmon, most (2,500) of which were sockeye salmon, 12 were coho salmon and two were Chinook salmon (Table 11-9). There were a total of 227 permits issued to residents of these three communities, with 102 permits issued to residents of Cooper Landing, 27 to residents of Hope, and 98 to residents of Ninilchik (Table 11-9).

Table 11-10 shows the harvest in this fishery since it was established in 2007. In all nine 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 three 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; 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 2016, 31,216 permits were issued for Upper Cook Inlet personal use fisheries, excluding the Beluga River dip net fishery. For the four fisheries combined (including unknown fishing locations), the estimated harvest was 365,070 salmon, including 348,706 sockeye (96%), and there were lower totals for the other four species (Table 11-12). The estimated harvest in 2016 was lower than the previous year in these fisheries, and also was below the 5-year (2011–2015) average of 567,262 salmon. For 1996 through 2015, the average annual harvest was 358,440 salmon; although participation and harvest grew steadily until about 2013 (Table 11-13).

Table 11-14 reports the number of permits issued for these four 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 58% of the harvest, followed by Kenai Peninsula Borough residents (18% of permits; 16% of harvests), Matanuska–Susitna Borough residents (17% of permits; 17%

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 (3% of permits; 3% of harvest).

Kasilof River Personal Use Setnet Fishery

This fishery takes place at the mouth of the Kasilof River between regulatory markers approximately one mile on either side of the river. Legal gear is a set gillnet no more than 10 fathoms in length, six 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 2016, the total estimated harvest in the fishery was 26,731 salmon, of which 26,539 (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 2015 was 20,149 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 2016 was 61,616 salmon, of which 95% was sockeye salmon. From 1996 through 2015, the average annual harvest in this fishery was 53,572 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, seven days per week from 6:00 AM to 11:00 PM; when the abundance of sockeye salmon is greater than two million fish, the fishery may be open by emergency order 24 hours a day. No more than one Chinook salmon per permit may be retained in this fishery. Estimated harvests totaled 271,523 salmon in 2016, including 259,057 sockeye salmon (95%). The average annual harvest from 1996 through 2015 was 269,576 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 2016 the fishery did not open. 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 four Upper Cook Inlet personal use fisheries (3 dip net fisheries and one setnet fishery) (excluding the Beluga River fishery, which is discussed below) were estimated at 5,200 salmon in 2016, 93% of which was sockeye salmon (4,837 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 one 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 one 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 101 salmon in 2016, compared to 82 salmon in 2015, 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 2016, the reported harvest, based on 169 returned permits (99% of the 170 permits issued), was 2,560 salmon, of which 2,033 (79%) were coho. The recent 10-year average harvest for this fishery (2006–2015) was 1,873 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 four 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 six 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 rural communities and tribes with traditional uses of halibut 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 2016, see Fall and Koster (2018). Due to lack of funding, no harvest estimate for the subsistence halibut fishery is available for 2013 or 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. (2007), Holen et al. (2014), and Jones et al. (2015).

Table 11-1.–Historical subsistence salmon harvests, Port Graham and Koyuktolik subdistricts, 1981–2016.

	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
2016	ND	32	17	620	697	239	22	1,595
5-year average (2011–2015)	-	17	30	2,555	929	471	845	4,831
10-year average (2006–2015)	-	29	71	2,535	927	343	1,108	4,984
Historical average (1981–2015)	-	48	1,222	1,630	646	854	3,280	5,148

Source Hollowell et al. (2017). 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, 2016.

	Permits		Reported salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Nanwalek	ND	20	15	620	677	199	12	1,523
Port Graham	ND	12	2	0	20	40	10	72
Total	**-**	**32**	**17**	**620**	**697**	**239**	**22**	**1,595**

Source Hollowell et al. (2017)

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, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Seldovia	4	4	7	53	0	1	2	63
Total	**4**	**4**	**7**	**53**	**0**	**1**	**2**	**63**

Source Hollowell et al. (2017).

Table 11-4.–Historical subsistence salmon harvests, Seldovia, 1996–2016.

	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
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
2016	4	4	7	53	0	1	2	63
5-year average (2011–2015)	14	8	7	111	0	21	30	169
10-year average (2006–2015)	15	10	10	92	13	21	53	188
Historical average (1997–2015)	18	15	60	110	8	19	37	235

Source Hollowell et al. (2017); ADF&G Division of Subsistence, 1996–2011.

Table 11-5.–Subsistence salmon harvests by community, Tyonek Subdistrict, 2016.

	Permits		Estimated salmon harvests					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Anchorage	10	7	147	6	21	0	0	174
Big Lake	1	1	0	0	0	0	0	0
Kenai	2	1	52	14	0	0	0	66
Nikiski	1	1	4	24	0	0	0	28
Palmer	1	1	2	0	0	0	0	2
Soldotna	2	0	0	0	0	0	0	0
Tyonek	57	53	825	144	203	8	12	1,192
Total	**74**	**64**	**1,030**	**188**	**225**	**8**	**12**	**1,462**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 11-6.–Historical subsistence salmon harvests, Tyonek Subdistrict, 1980–2016.

	Permits		Estimated salmon harvests					
Year	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
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
2016	74	64	1,030	188	225	8	12	1,462
5-year average (2011–2015)	92	65	1,054	339	332	9	12	1,746
10-year average (2006–2015)	91	67	1,159	263	262	6	8	1,699
Historical average (1981–2015)	79	60	1,438	190	182	12	10	1,833

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

a Harvests were not expanded due to unknown permit returns.

ND = no data

Table 11-7.–Subsistence salmon harvests by community, Upper Yentna River, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook[a]	Sockeye	Coho	Chum	Pink	Total
Big Lake	1	1	0	15	1	2	0	18
Skwentna	12	11	0	231	139	10	34	413
Talkeetna	1	1	0	15	7	0	0	22
Wasilla	4	4	0	66	15	3	0	84
Willow	2	2	0	80	7	11	2	100
Eagle River	1	1	0	0	0	0	0	0
Chugiak	2	2	0	53	18	11	0	82
Unknown City	3	3	0	54	17	0	0	71
Total	**26**	**25**	**0**	**514**	**204**	**37**	**36**	**790**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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, 1996–2016.

	Permits		Estimated salmon harvest					
Year	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
2016	26	25	0	514	204	37	36	790
5-year average (2011–2015)	23	22	0	389	88	35	110	621
10-year average (2006–2015)	23	22	0	388	80	25	64	558
Historical average (1996–2015)	21	20	0	421	83	19	43	565

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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, 2016.

	Permits		Reported salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Cooper Landing	102	95	1	1,363	0	0	0	1,364
Hope	27	27	0	307	0	0	0	307
Ninilchik	98	97	1	830	12	0	0	843
Total	**227**	**219**	**2**	**2,500**	**12**	**0**	**0**	**2,514**

Source Jeffry Anderson, USFWS, Kenai Fish & Wildlife Field Office, personal communication.

Table 11-10.–Historical federal subsistence salmon harvests, Kenai and Kasilof rivers, 2007–2016.

	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
2016	227	219	2	2,500	12	0	0	2,514

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.

	Permits		Reported salmon harvest					
Year[a]	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[c]								
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, 2016.

	Permits		Estimated salmon harvest[b]					
Year[a]	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Lower Cook Inlet								
Kachemak Bay setnet	170	169	18	166	2,033	335	8	2,560
China Poot Bay dip net[a]								
Subtotal, Lower Cook Inlet	**170**	**169**	**18**	**166**	**2,033**	**335**	**8**	**2,560**
Upper Cook Inlet								
Kasilof River setnet[c]			141	26,539	23	23	5	26,731
Kasilof River dip net[c]			26	58,273	1,255	329	1,733	61,616
Kenai River dip net[c]			638	259,057	3,277	717	7,834	271,523
Fish Creek dip net[c]			--	--	--	--	--	--
Unknown Upper Cook Inlet[c]			15	4,837	34	81	233	5,200
Subtotal, common permit fisheries[c]	**31,216**	**23,854**	**820**	**348,706**	**4,589**	**1,150**	**9,805**	**365,070**
Beluga River dip net	11	10	0	52	45	2	2	101
Subtotal, Upper Cook Inlet	**31,227**	**23,864**	**820**	**348,758**	**4,634**	**1,152**	**9,807**	**365,171**
Cook Inlet Total	**31,397**	**24,033**	**838**	**348,924**	**6,667**	**1,487**	**9,815**	**367,731**

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, 1996–2016.

	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
2016	31,216	23,854	820	348,706	4,589	1,150	9,805	365,070
5-year average (2011–2015)	34,989	27,205	376	548,469	7,481	1,327	9,642	567,262
10-year average (2006–2015)	30,149	24,338	925	460,550	5,975	1,037	8,831	477,302
Historical average (1996–2015)	23,861	19,641	954	346,571	4,420	691	5,812	358,440

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, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Anchor Point	239	197	4	2,249	9	4	63	2,329
Clam Gulch	49	42	2	448	1	0	7	459
Cooper Landing	17	14	0	122	1	1	2	125
Fritz Creek	5	5	0	61	0	0	2	63
Homer	738	623	16	7,836	65	17	190	8,125
Hope	9	9	0	102	0	0	1	103
Kasilof	410	342	30	4,852	26	21	80	5,010
Kenai	1,527	1,225	51	16,000	90	29	478	16,648
Moose Pass	24	21	0	174	1	0	10	184
Nikiski	200	155	3	1,889	12	4	62	1,969
Nikolaevsk	8	6	0	92	4	0	1	97
Ninilchik	103	88	2	667	14	1	17	700
Seldovia	5	2	0	47	1	0	1	48
Seward	161	135	6	1,396	8	6	36	1,451
Soldotna	1,795	1,529	45	17,474	114	34	450	18,117
Sterling	438	378	9	4,428	30	5	128	4,600
Subtotal, Kenai Peninsula Borough	**5,728**	**4,771**	**169**	**57,835**	**374**	**122**	**1,528**	**60,029**
Anchorage	14,747	11,024	361	167,499	2,362	719	5,112	176,052
Chugiak	636	538	22	7,200	142	15	138	7,517
Eagle River	1,872	1,556	52	22,673	345	23	558	23,650
Girdwood	210	171	5	2,570	10	4	68	2,656
Joint Base Elmendorf Richardson	304	221	6	2,596	85	4	89	2,780
Subtotal, Anchorage Municipality	**17,769**	**13,510**	**446**	**202,538**	**2,943**	**765**	**5,964**	**212,655**
Big Lake	157	117	3	1,577	23	7	37	1,646
Chickaloon	8	8	0	86	0	0	0	86
Houston	32	24	2	436	1	2	9	451
Palmer	1,460	1,147	43	17,222	210	27	516	18,018
Sutton	60	46	0	542	8	1	13	564
Talkeetna	75	66	5	994	11	3	36	1,049
Trapper Creek	24	20	1	283	1	0	3	288
Wasilla	3,264	2,558	79	37,748	585	138	865	39,416
Willow	149	114	4	1,904	40	3	58	2,010
Subtotal, Matanuska-Susitna Borough	**5,229**	**4,100**	**137**	**60,793**	**879**	**181**	**1,538**	**63,528**
Akiachak	1	0	0	9	0	0	0	10
Alexander	1	1	0	16	0	0	0	16
Allakaket	1	1	0	0	0	0	0	0
Ambler	3	2	0	92	0	0	1	94
Anaktuvuk Pass	4	3	0	75	0	0	1	77
Anderson	5	5	0	71	0	0	0	71
Arctic Village	2	2	0	17	0	0	4	21
Atqasuk	2	1	0	13	0	0	0	14

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Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Barrow	71	43	1	941	19	1	24	985
Bethel	15	9	0	114	1	0	3	118
Buckland	1	1	0	0	0	0	0	0
Cantwell	7	7	0	50	4	0	0	54
Chenega Bay	3	3	0	14	0	0	0	14
Chevak	2	1	0	9	0	0	0	10
Chiniak	1	0	0	9	0	0	0	10
Chitina	1	1	0	9	0	0	1	10
Clear	9	8	1	159	0	0	7	168
Cold Bay	1	1	0	0	0	0	0	0
Copper Center	4	2	0	23	0	0	1	24
Cordova	6	4	0	18	0	0	1	19
Craig	1	1	0	10	0	0	0	10
Delta Junction	30	29	0	559	2	4	9	575
Denali National Park	21	20	0	284	0	0	12	297
Dillingham	1	1	1	13	0	0	2	16
Eagle	1	1	0	0	0	0	0	0
Eek	1	0	0	9	0	0	0	10
Eielson AFB	18	17	0	252	74	0	10	337
Ester	7	5	0	78	0	0	7	85
Fairbanks	584	485	14	7,191	107	28	187	7,526
Fort Greely	5	5	0	12	0	0	0	12
Fort Wainwright	12	8	0	110	1	0	4	115
Gakona	1	1	0	0	0	0	0	0
Galena	2	2	0	11	0	0	0	11
Glennallen	4	4	0	34	0	0	0	34
Haines	3	2	0	29	0	0	1	31
Healy	43	38	2	602	1	0	25	630
Holy Cross	1	0	0	9	0	0	0	10
Hooper Bay	1	1	0	8	0	0	1	9
Huslia	2	2	0	40	0	0	0	40
Iliamna	1	0	0	9	0	0	0	10
Juneau	47	34	2	548	4	0	11	566
Kaktovik	4	2	1	33	0	0	1	35
Kalskag	2	2	0	18	0	0	0	18
Ketchikan	7	6	0	101	1	0	3	106
Kiana	1	1	0	17	0	0	0	17
Kobuk	1	1	0	2	0	0	0	2
Kodiak (city)	20	12	0	192	1	0	2	196
Kotlik	1	1	0	4	0	0	0	4
Kotzebue	17	13	1	180	6	0	8	195
Koyuk	1	1	0	23	0	0	0	23
Kwethluk	1	1	0	13	0	0	0	13
McGrath	4	3	0	124	0	0	0	125
Metlakatla	1	1	0	0	0	0	0	0
Mountain Village	2	2	0	5	0	0	0	5
Naknek	1	0	0	9	0	0	0	10
Napakiak	1	0	0	9	0	0	0	10

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Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Nenana	10	9	1	149	0	0	18	169
New Stuyahok	1	1	0	0	0	0	0	0
Nikolai	2	1	0	16	0	0	0	17
Noatak	2	1	0	26	0	0	0	27
Nome	13	11	0	157	0	0	10	167
Nondalton	1	1	0	18	0	0	0	18
Noorvik	6	4	0	58	1	0	1	60
North Pole	167	138	8	1,896	15	6	64	1,988
Nuiqsut	3	1	0	43	0	0	1	44
Petersburg	4	4	0	35	0	0	0	35
Point Hope	3	0	0	28	1	0	1	29
Port Alsworth	1	1	0	1	0	0	0	1
Port Heiden	1	1	0	2	0	0	0	2
Prudhoe Bay	1	0	0	9	0	0	0	10
Saint George	1	1	0	2	0	0	0	2
St. Marys	1	0	0	9	0	0	0	10
Saint Michael	1	0	0	9	0	0	0	10
Salcha	5	3	0	27	0	0	1	28
Sand Point	1	0	0	9	0	0	0	10
Selawik	1	1	0	0	0	0	0	0
Shishmaref	1	1	0	12	0	0	0	12
Sitka	6	5	0	45	0	0	0	46
Skagway	2	1	0	18	0	0	0	19
Skwentna	1	1	0	28	0	0	1	29
Teller	2	2	0	6	0	0	0	6
Thorne Bay	2	0	0	18	0	0	1	19
Tok	13	11	0	159	0	0	1	160
Toksook Bay	1	1	0	0	0	0	0	0
Tuntutuliak	1	0	0	9	0	0	0	10
Two Rivers	6	5	1	63	0	0	2	67
Unalakleet	5	2	1	75	1	0	1	77
Unalaska	2	0	0	18	0	0	1	19
Valdez	20	17	0	162	1	0	1	163
Whittier	6	4	0	105	0	0	2	107
Wiseman	1	1	0	0	0	0	0	0
Wrangell	3	3	1	32	4	0	1	38
Subtotal, other Alaska	**1,287**	**1,029**	**36**	**15,429**	**250**	**43**	**434**	**16,190**
Other USA	36	17	2	352	3	2	22	382
Unknown Communities	1,167	427	30	11,759	140	38	319	12,286
Total	**31,216**	**23,854**	**820**	**348,706**	**4,589**	**1,150**	**9,805**	**365,070**

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, 1982–2016.

	Permits		Estimated salmon harvest					
Year[a]	Total	Returned	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
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
2016	NA	NA	141	26,539	23	23	5	26,731
5-year average (2011–2015)	NA	NA	85	21,398	112	9	41	21,645
10-year average (2006–2015)	NA	NA	147	22,280	130	8	29	22,595
Historical average (1996–2015)[d]	NA	NA	184	19,840	92	7	26	20,149

Source Ruesch and Fox (1996) for 1982–1995; Division of Sport Fish for 1996–2016.

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, 1981–2016.

	Permits		Estimated salmon harvest[a]					
Year[b]	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[c,d]	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
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	1,170	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
2016	NA	NA	26	58,273	1,255	329	1,733	61,616
5-year average (2011–2015)	NA	NA	12	77,245	1,828	314	1,321	80,720
10-year average (2006–2015)	NA	NA	26	68,352	1,440	241	1,102	71,161
Historical average (1996–2015)[g]	NA	NA	55	51,519	1,031	149	818	53,572

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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 1996–2016.

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, 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, 1981–2016.

	Permits		Estimated salmon harvest[a]					
Year[b]	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
2016	NA	NA	638	259,057	3,277	717	7,834	271,523
5-year average (2011–2015)	NA	NA	272	433,867	4,156	838	6,919	446,053
10year average (2006–2015)	NA	NA	732	355,189	3,301	651	6,743	366,616
Historical average (1996–2015)[h]	NA	NA	659	261,682	2,437	439	4,358	269,576

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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 1996–2016.

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 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 salmon 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, 1987–2016.

	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
2016	--	--	--	--	--	--	--	--
Historical average (1996–2015)	NA	NA	6	8,813	1,261	106	732	10,918

Source Brannian and Fox (1996) for 1987–1994; Howe et al. (1996) for 1995; Division of Sport Fish for 1996–2011 and 2014–2016.

a. Estimates derived from statewide sport harvest survey prior to 1996. Permits required since 1996.

b. Fishery closed 2002–2008, 2012, 2013, and 2016.

Table 11-19.–Estimated salmon harvests, unknown Upper Cook Inlet personal use fisheryfishery, 1996–2016.

	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
2016	NA	NA	15	4,837	34	81	233	5,200
5-year average (2011–2015)	NA	NA	7	9,862	160	40	220	10,289
10-year average (2006–2015)	NA	NA	18	8,260	129	42	209	8,657
Historical average (1996–2015)	NA	NA	53	8,645	166	37	207	9,109

Source ADF&G Division of Sport Fish.

Table 11-20.–Beluga River senior personal use dip net fishery summary, 2008–2016.

	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
2016	11	10	0	52	45	2	2	101
Historical average (2008–2015)	11	11	0	61	28	2	1	92

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, 1969–2016.

	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
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

-continued-

Table 11-21.–Page 2 of 2.

	Households or permits		Reported salmon harvest					
Year	Total	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2015	136	131	10	509	1,373	22	152	2,066
2016	170	169	18	166	2,033	335	8	2,560
5-year average (2011–2015)	127	122	10	260	1,531	43	145	1,990
10-year average (2006–2015)	129	123	10	197	1,375	29	263	1,873
Historical average (1969–2015)	243	228	41	87	2,493	37	556	3,214

Source Hollowell et al. (2017).

Table 11-22.–Estimated personal use salmon harvests, China Poot dip net fishery, 1980–1995[a].

		Estimated salmon harvest					
Year	Fishers	Chinook	Sockeye	Coho	Chum	Pink	Total
1980	NA	0	1,000	0	0	0	1,000
1981[b]	--	--	--	--	--	--	--
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	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 based on the 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. Harvest data not collected after 1995.

b. Fishery was closed in 1981.

NA = Data not available.

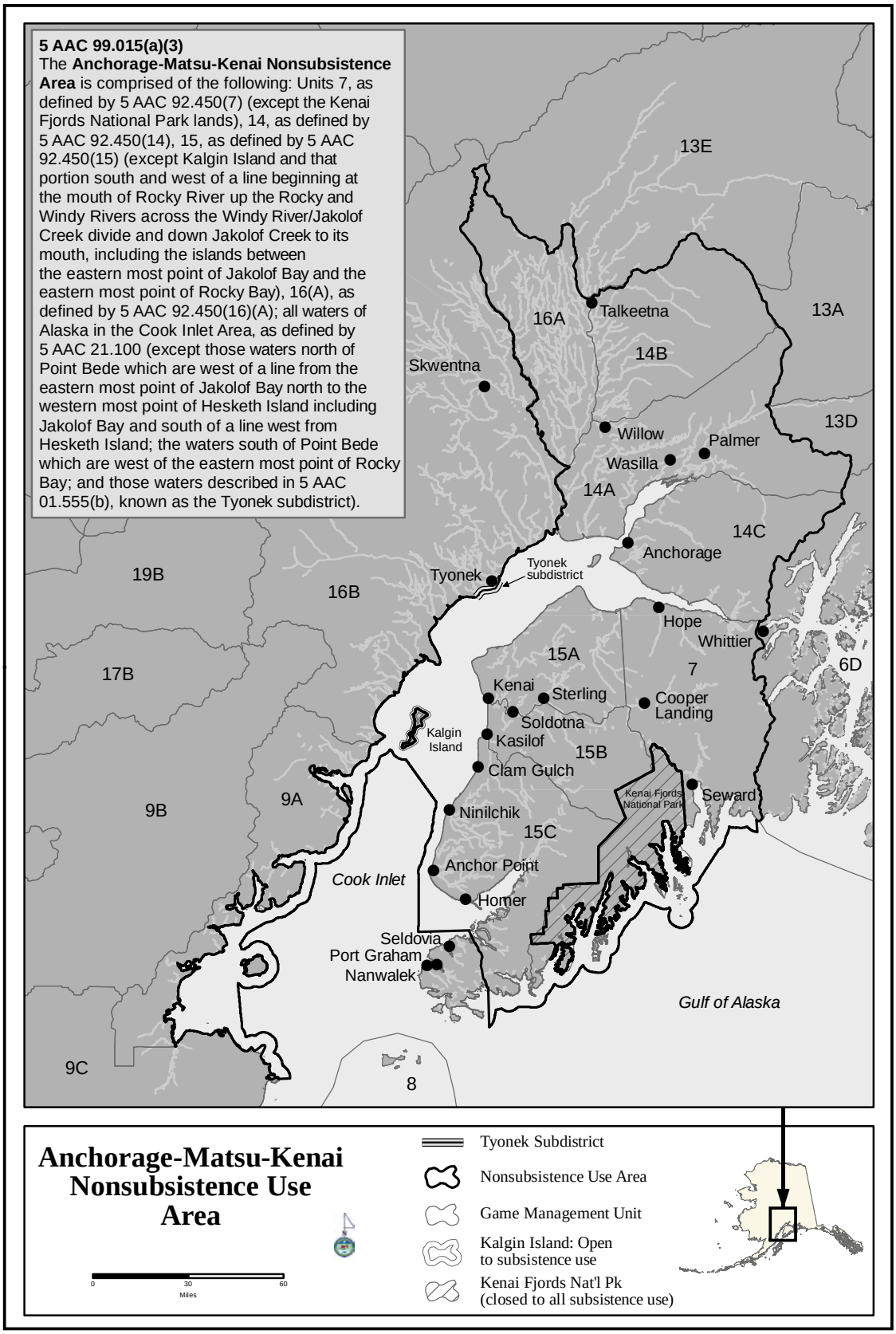

Figure 11-1.–Anchorage-Matsu-Kenai Nonsubsistence Use Area.

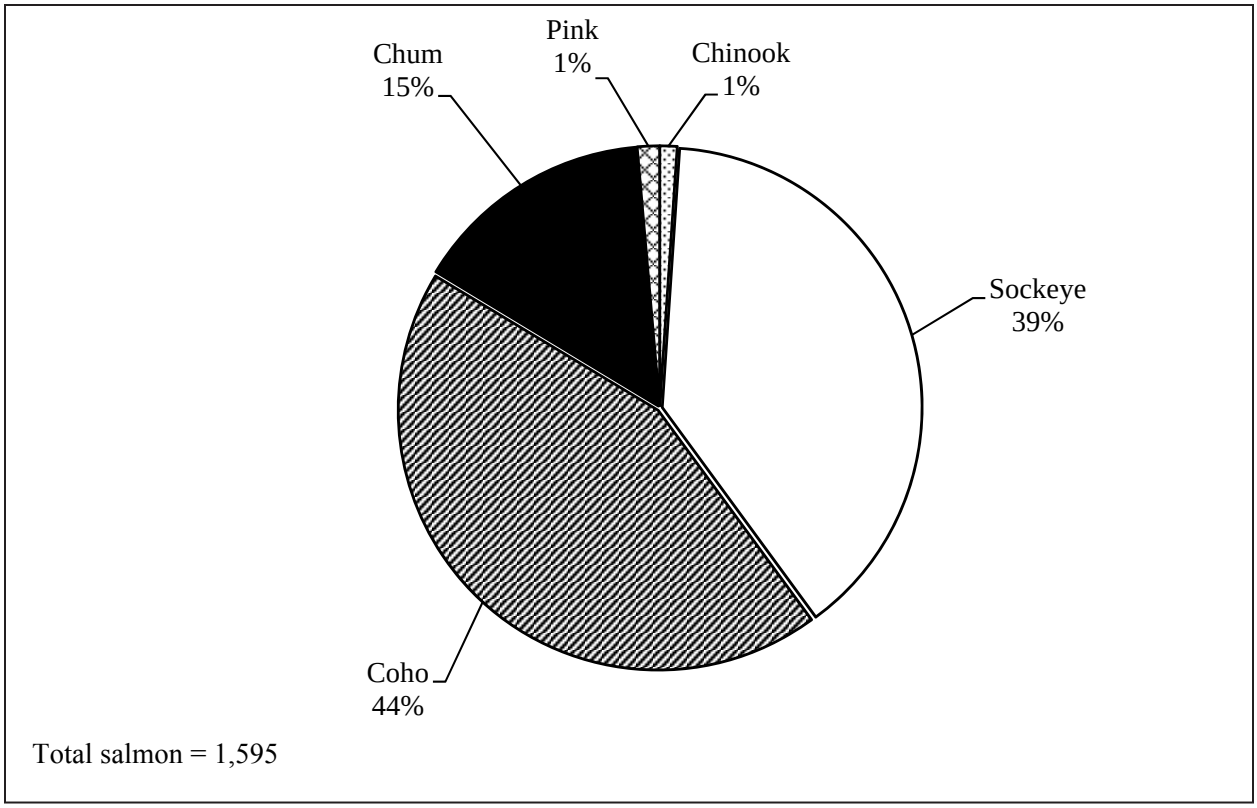

Figure 11-2.–Subsistence salmon harvests in the Port Graham and Koyuktolik subdistricts, 2016.

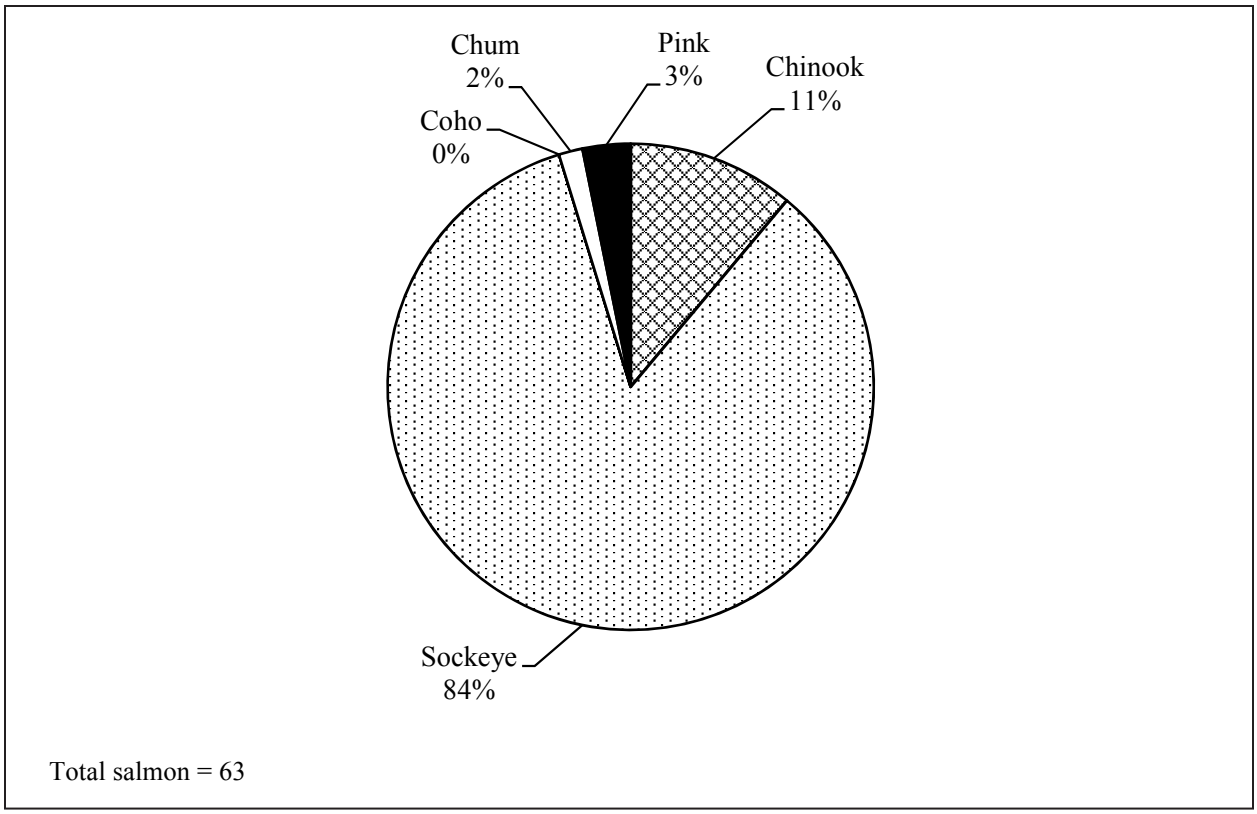

Figure 11-3.–Subsistence salmon harvests in Seldovia, 2016.

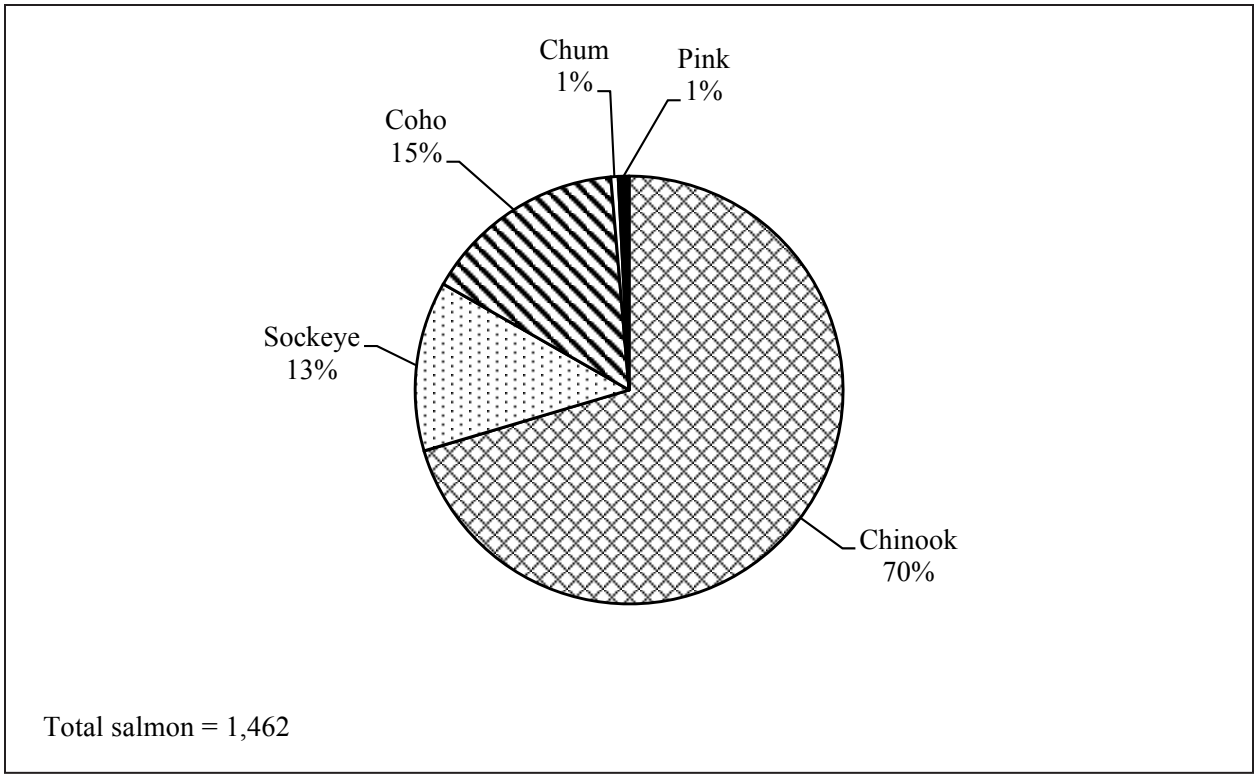

Figure 11-4.–Subsistence salmon harvests in the Tyonek Subdistrict, 2016.

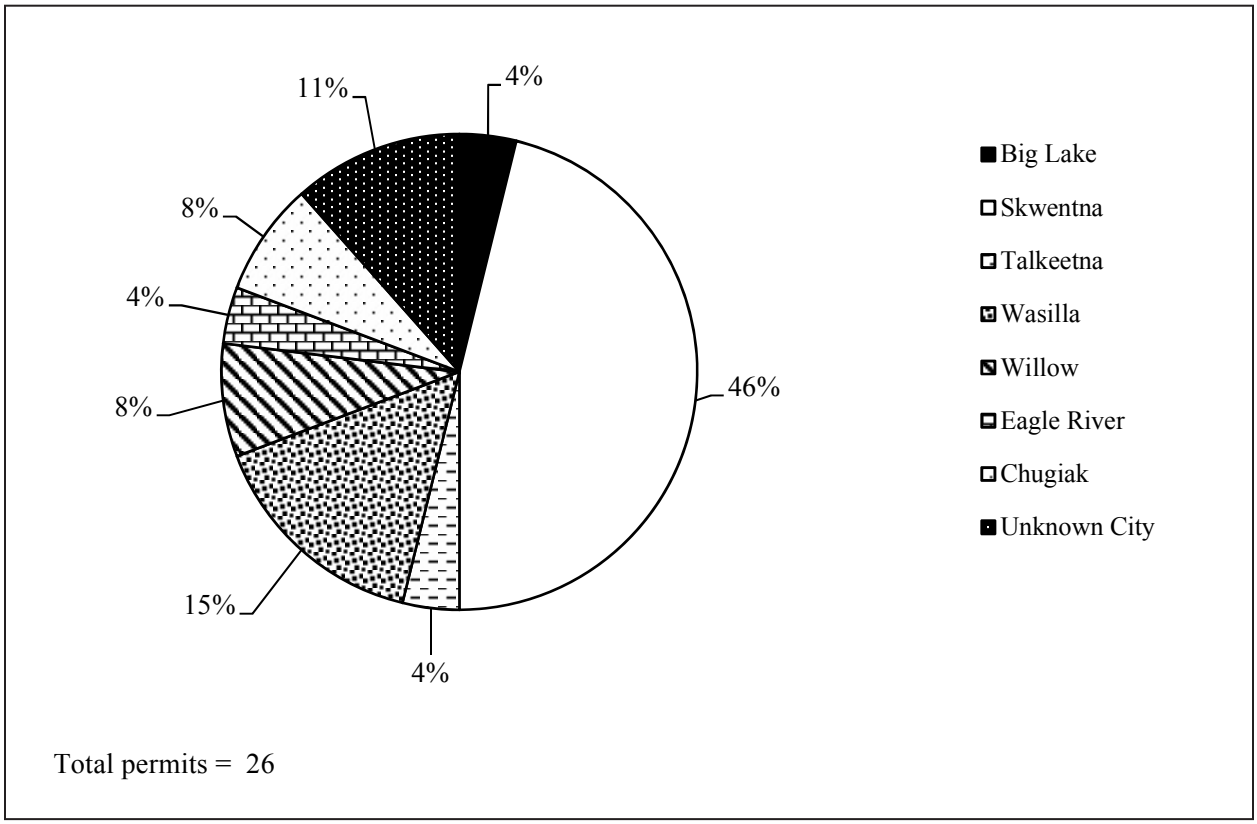

Figure 11-5.–Permits issued, by place of residence, for the Upper Yentna River fishery, 2016.

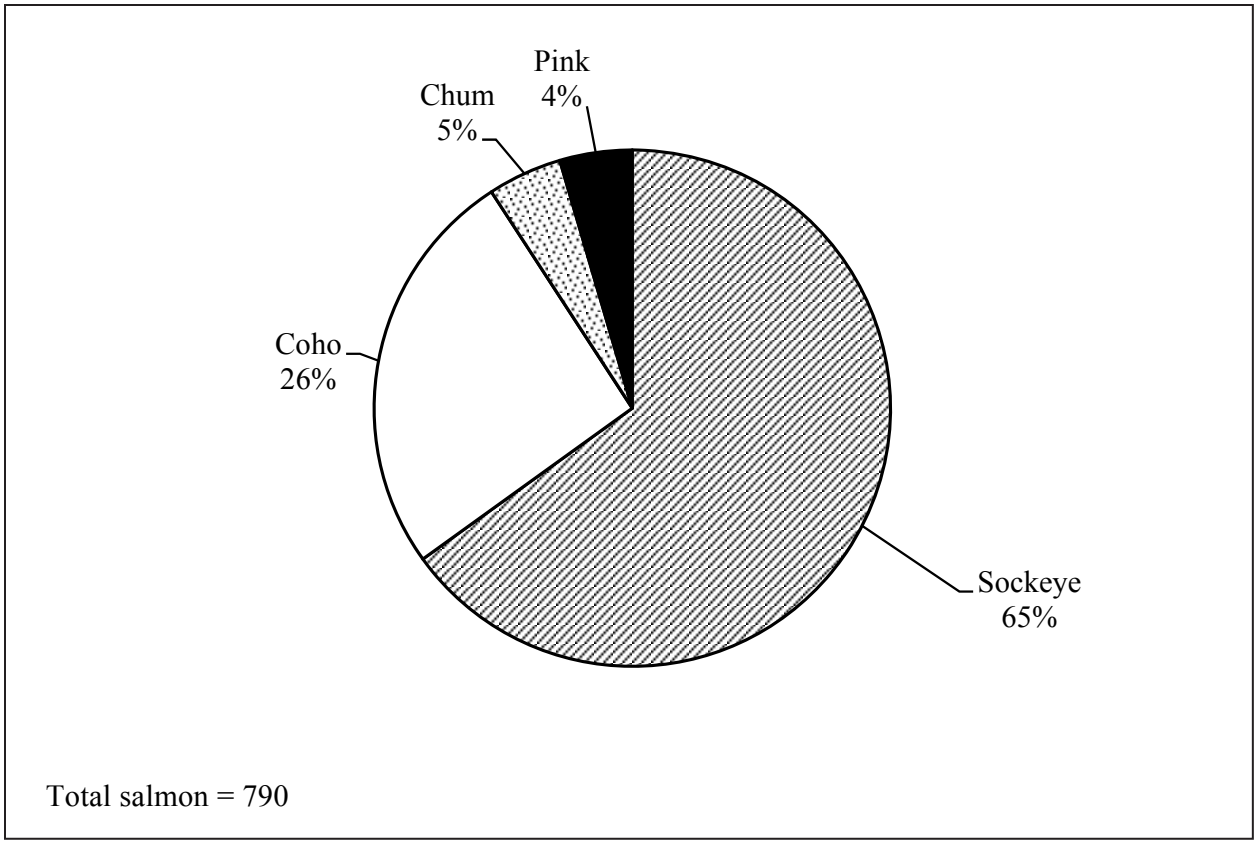

Figure 11-6.–Subsistence salmon harvests in the Upper Yentna River, 2016.

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 2016, approximately 13,892 personal use and subsistence permits for the Prince William Sound Management Area were issued to Alaska residents, with a total estimated harvest of 247,911 salmon.

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 2016 there were nine subsistence and one 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
- Prince William Sound, general area: state subsistence permit program, and
- 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, except for 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 2016 population of approximately 2,600 people.[1] Fewer communities are situated along the coastline of the

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

Prince William Sound Management Area than in the Copper River Basin. These communities range in size from Valdez and Cordova (2016 population estimates of 3,937 and 2,386 residents, respectively) to Whittier (248 residents), Tatitlek (88 residents), and Chenega Bay (72 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 two 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 subsistence 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 two 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.
- 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

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

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 two assumptions: 1) permittees returning only one 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 one 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 reflected 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 support 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 three 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 one person or 60 salmon for a household of two persons, of which no more than five may be Chinook salmon if taken with a dip net. For a household of more than two, 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 two 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 five 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 2016 no community fish wheel permits were issued.

Subsistence Salmon Harvests in 2016

As shown in Table 12-2, ADF&G and NPS issued a total of 2,089 subsistence salmon permits for the Glennallen Subdistrict for 2016. This total is higher than both the recent 5-year average (1,787 permits), 10-year average (1,604 permits), and the historical average (1989–2015; 1,199) and continues a relatively steady increase in issued permits since 1990. Since 1990, due to the *McDowell* decision, all residents of Alaska may 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 2016 for both federal and state fisheries was 87,960 salmon, the majority of which were sockeye salmon (Table 12-2). The harvest was composed of 85,336 sockeye salmon (approximately 97% of the year's salmon harvest), 2,557 Chinook salmon, and 66 coho salmon. Pink and chum salmon are generally not available in the Upper Copper River. The 2016 harvest was much lower than the 2015 harvest, and notably lower than the 5-year average (101,081 salmon), slightly lower than the 10-year average (90,889 salmon), but slightly higher than the historical average (1989–2015; 74,217 salmon).

Table 12-3 reports subsistence salmon harvests in the Glennallen Subdistrict by place of residence of permit holders in 2016. Copper Basin residents caught 26% of the harvest (22,880 salmon) and other Alaska residents harvested 74% (65,080 salmon). Of all Glennallen Subdistrict permits (federal and state), residents of Copper Basin communities held 359 permits (approximately 17%) and other Alaska residents held 1,730 permits (83%) (Table 2-3). The communities with the most permits and salmon harvested were Anchorage with 502 permits (14,898 salmon harvested), Fairbanks with 293 permits (9,586 salmon harvested), Wasilla with 271 permits (13,337 salmon), Palmer with 163 permits (5,947 salmon), and North Pole with 114 permits issued (4,518 salmon harvested). In 2016, Copper Center had fewer permits, 91, than in 2015 (110), and harvested fewer salmon (9,051) than the year before (12,014).

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 one 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 2016

As reported in Table 12-4, the estimated total salmon harvest in the Chitina Subdistrict personal use fishery in 2016 was 155,863 fish, including 153,916 sockeye salmon (99%), 1,256 coho salmon, and 691 Chinook salmon. In 2016, 11,353 permits were issued. The 2016 total estimated harvest was the lowest harvest since 2012 (138,465 fish), below the recent 5-year average (174,769 salmon), but above the 10-year (146,929 salmon) average and the historical average (1989–2015; 123,621 salmon). The number of permits issued was lower in 2016 than in 2014 and 2015 but was above the 5- and 10-year averages, as well as the historical average. Harvests of Chinook salmon were below the recent 5-year average and 10-year averages, as well as below the historical average (which reflect the regulatory change limiting personal use permittees to one Chinook salmon). Coho salmon harvests in 2016 were slightly higher than the 5-year average (1,234), but below the 10-year and historical averages.

Table 12-5 reports estimated salmon harvests in the Chitina Subdistrict personal use fishery by mailing address of state permit holders in 2016; most participants in this fishery lived in Fairbanks, Anchorage, or the Matanuska–Susitna Borough. Only 45 Copper Basin residents (<1%) obtained state personal use salmon permits for the Chitina Subdistrict in 2016. The other permits were issued to non-area residents, who harvested all but 377 of the salmon harvested (>99%). The communities with the most permits issued were Anchorage (3,566 permits), Fairbanks (2,868 permits), Wasilla (1,126), North Pole (870 permits), and Palmer (600 permits).

Chitina Subdistrict Federal Subsistence Fishery

Regulations

In 2016, 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 2016

As reported in Table 12-6, an estimated 2,044 salmon were harvested in the federal Chitina Subdistrict subsistence fishery in 2016. This is below both the recent 5-year average of 2,171 salmon and the 10-year average (2006–2015; 2,184 salmon) and slightly above the historical average (1989–2015; 2,041 salmon).

The total harvest included 1,979 sockeye salmon (97%), 45 coho salmon, and 20 Chinook salmon. A total of 128 permits were issued, which was the largest number of issued permits ever issued for this fishery. Table 12-7 reports harvest and permit numbers according to each permittee's community of residence in 2016 for the Chitina Subdistrict federal subsistence fishery. 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 2016

Since 1987, subsistence permits have been issued in 17 of the 30 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. No permits were issued in 2016. The historical average (1987–2015) harvest for this fishery is 126 sockeye salmon, with the highest harvest occurring in 1994 with a take of 997 sockeye salmon. The second highest harvest occurred in 2013 with 867 salmon harvested, including five Chinook and 862 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 seven days per week in the Copper River District from May 15 until two 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 16 in 2016. Regulations stipulate that two days following the closure of the Copper River District to commercial salmon fishing for the season, subsistence fishing is allowed seven days a week until September 30. The commercial salmon fishing season in the Copper River District closed on October 12. Annual limits for salmon are 15 for a household of one; 30 salmon for a household of two or more; and 10 salmon for each additional person in the household. There is a limit of five 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 2016

As reported in Table 12-9, 198 permits were issued for this fishery in 2016, and 192 (97%) were returned. Participation in 2016 was lower than in recent years, far below both the 5-and 10-year averages (343 and 376 permits, respectively), but greater than the historical average (1965–2015; 182 permits). The estimated 2016 harvest of 1,206 salmon was a decrease from the previous year (1,709) and was well below the recent 5- and 10-year averages. The 2016 harvest was composed of 1,119 sockeye salmon (93%), 75 Chinook salmon (6%), and 12 pink salmon (<1%), with no chum or coho salmon harvested. Most permit holders lived in Cordova (163) and took 96% 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 2016 data indicated a reported harvest of 203 sockeye salmon and 86 Chinook salmon with the educational drift gillnet permits (Russell et al. 2017:44, 46). Harvest information is tracked by Division of Commercial fish, which includes a 10-year average (2006–2015) for the educational permit fishery of 83 sockeye salmon and 36 Chinook salmon (Russell et al. 2017:44, 46). Historically, no coho salmon have been harvested in this fishery (Russell et al. 2017:62).

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 four inches or gillnets up to 150 fathoms in length with a maximum mesh size of six and one-quarter inches. 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: seven days per week from May 15 until two days before the commercial opening of the Eastern District; during the commercial fishing season, but only during commercial openers; and seven days per week from two days after the closure of the commercial season through October 31. There are no bag or possession limits for this fishery.

Subsistence Harvests in 2016

In 2016, there were five permits issued for this fishery (Table 12-11) with no reported harvest. 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 four inches, 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: seven days per week from May 15 until two days before the commercial opening of the Southwestern District; during the commercial fishing season at the time of commercial openers; and seven days per week from two days after the closure of the commercial season through October 31. There are no bag or possession limits for this fishery.

Subsistence Harvests in 2016

In 2016, seven permits were issued for this fishery and six 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 2016 was 48 salmon, with 32 sockeye, 15 chum, and one coho salmon harvested. The 2016 harvest is the second-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 2016

In the last 27 years, issued permits have been typically low, with a 5-year average of 14 and a 10-year average of 10 (Table 12-15). In 2016, two permits were issued and two were returned; the lowest issued since 2010. The estimated harvest for 2016 was one sockeye salmon. The 2016 harvest was far below the 5- and 10-year average harvests, as well as the historical (1960–2015) harvest (Table 12-15). The 2016 permit holders were from Eagle River and Cordova (Table 12-16).

Prince William Sound/Chugach National Forest Federal Subsistence Fishery

Background and History

In 2005, the federal government through the US Forest Service began issuing permits for subsistence salmon fishing on federal lands in PWS and the lower Copper River area (Haught et al. 2017:44).

Regulations

Allowable gear types for the Prince William Sound/Chugach Subdistrict include dip net, rod and reel, and spear.

Subsistence Harvests in 2016

In 2016, reported harvest of total salmon in the Federal subsistence fishery, Prince William Sound/Chugach Subdistrict was 789 salmon. This included 234 sockeye, and 555 coho salmon. The total number of issued permits was 110, with 93 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 2016 (Fall and Koster 2018).

In 2016, 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 five pots per person and five 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 Division of Sport Fish 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 Rumble et al. (2018) for 2016. 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, 1997–2016.

		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 2017 (ADF&G 2018).

a. Did not fish

b. Did not return permit.

Table 12-2.–Historic subsistence salmon harvests, Glennallen Subdistrict, 1989–2016.

	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
2016	2,089	1,688	2,557	85,336	66	0	0	87,960
5-year average (2011–2015)	1,787	1,519	2,718	97,915	448	0	0	101,081
10-year average (2006–2015)	1,604	1,371	3,036	87,431	421	0	0	90,889
Historical average (1989–2015)	1,199	1,055	2,689	71,058	469	1	0	74,217

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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, Glennallen Subdistrict, 2016.

Community	Permits		Estimated salmon harvest[a]					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Chistochina	5	4	1	328	1	0	0	330
Chitina	22	18	61	1,051	1	0	0	1,113
Copper Center	91	67	107	8,944	0	0	0	9,051
Copperville	4	4	22	371	0	0	0	393
Gakona	35	27	57	1,807	0	0	0	1,864
Glennallen	71	59	106	4,132	0	0	0	4,238
Gulkana	2	0	0	0	0	0	0	0
Kenny Lake	34	30	84	1,555	0	0	0	1,639
Lake Louise	1	1	0	43	0	0	0	43
McCarthy	14	11	0	0	0	0	0	0
Mendeltna	1	1	0	2	0	0	0	2
Nelchina	3	3	0	52	0	0	0	52
Slana	22	21	1	856	0	0	0	857
Tazlina	49	39	137	3,049	10	0	0	3,196
Tolsona	5	5	2	99	0	0	0	101
Subtotal, Copper Basin	**359**	**290**	**578**	**22,289**	**13**	**0**	**0**	**22,880**
Anchor Point	2	2	5	58	0	0	0	63
Anchorage	502	385	511	14,387	0	0	0	14,898
Barrow	6	4	0	15	0	0	0	15
Big Lake	5	3	8	380	0	0	0	388
Bird Creek	1	0	0	0	0	0	0	0
Cantwell	3	3	2	45	0	0	0	47
Chickaloon	4	3	1	44	0	0	0	45
Chugiak	27	22	20	409	0	0	0	428
Cooper Landing	1	1	0	0	0	0	0	0
Cordova	1	1	0	6	0	0	0	6
Delta Junction	42	37	53	1,686	0	0	0	1,739
Eagle River	91	80	110	3,472	0	0	0	3,582
Ester	7	6	14	330	0	0	0	344
Fairbanks	293	226	264	9,296	26	0	0	9,586
Fort Greely	1	1	0	4	0	0	0	4
Fort Wainwright	4	2	0	90	0	0	0	90
Fort Yukon	1	0	0	0	0	0	0	0
Girdwood	4	3	1	21	0	0	0	23
Healy	1	1	0	1	0	0	0	1
Homer	1	1	0	12	0	0	0	12
Houston	5	5	10	465	0	0	0	475
Joint Base Elmendorf Richardson	5	4	3	65	0	0	0	68
Juneau	2	2	0	47	0	0	0	47
Kenai	1	1	0	0	0	0	0	0
Kennicott	3	2	0	0	0	0	0	0
Ketchikan	1	1	1	8	0	0	0	9
Mentasta Lake	6	3	8	270	0	0	0	278
Minto	1	1	0	0	0	0	0	0
Moose Creek	1	1	0	0	0	0	0	0
Nabesna	5	5	0	216	0	0	0	216

-continued-

Table 12-3.–Page 2 of 2.

Community	Permits		Estimated salmon harvest[a]					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Nenana	1	1	4	165	0	0	0	169
Nome	1	1	2	276	0	0	0	278
North Pole	114	97	146	4,372	0	0	0	4,518
Northway	6	4	8	362	0	0	0	369
Palmer	163	132	169	5,775	2	0	0	5,947
Peters Creek	1	1	2	54	0	0	0	56
Salcha	11	9	5	182	0	0	0	187
Seldovia	1	1	2	34	0	0	0	36
Seward	3	3	0	23	0	0	0	23
Soldotna	5	5	78	206	2	0	0	286
Sutton	6	6	0	77	0	0	0	77
Talkeetna	1	1	0	68	0	0	0	68
Tanacross	1	1	0	29	0	0	0	29
Tetlin	1	0	0	0	0	0	0	0
Tok	47	38	25	4,255	0	0	0	4,279
Tonsina	5	5	15	392	0	0	0	407
Two Rivers	2	1	0	0	0	0	0	0
Unknown Community	4	4	0	215	0	0	0	215
Valdez	51	41	114	2,030	0	0	0	2,144
Wasilla	271	233	370	12,944	23	0	0	13,337
Willow	8	8	27	262	0	0	0	289
Subtotal, other communities	**1,730**	**1,398**	**1,979**	**63,047**	**54**	**0**	**0**	**65,080**
Total	**2,089**	**1,688**	**2,557**	**85,336**	**66**	**0**	**0**	**87,960**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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, 1989–2016.

	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
2016	11,353	9,301	691	153,916	1,256	0	0	155,863
5-year average (2011–2015)	10,759	8,784	987	172,547	1,234	0	0	174,769
10-year average (2006–2015)	9,598	7,939	1,324	143,948	1,657	0	0	146,929
Historical average (1989–2015)	8,298	7,289	2,785	118,730	2,107	0	0	123,621

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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, state Chitina Subdistrict permits, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Copper Center	16	13	0	114	0	0	0	114
Glennallen	29	24	1	251	10	0	0	262
Subtotal, Copper Basin	**45**	**37**	**1**	**366**	**10**	**0**	**0**	**377**
Akiachak	1	0	0	0	0	0	0	0
Anaktuvuk Pass	1	1	0	31	0	0	0	31
Anchor Point	8	8	0	31	0	0	0	31
Anchorage	3,566	2,814	304	43,128	336	0	0	43,768
Anderson	6	6	0	1	0	0	0	1
Barrow	20	12	0	420	0	0	0	420
Bethel	3	0	0	0	0	0	0	0
Bettles	1	1	0	16	0	0	0	16
Bettles Field	2	1	0	0	0	0	0	0
Big Lake	48	38	4	572	1	0	0	577
Bird Creek	2	2	0	21	0	0	0	21
Cantwell	3	3	0	25	0	0	0	25
Central	2	2	0	25	0	0	0	25
Chenega Bay	2	2	0	0	0	0	0	0
Chickaloon	11	11	2	253	0	0	0	255
Chicken	1	0	0	0	0	0	0	0
Chugiak	147	126	19	1,832	9	0	0	1,860
Clear	8	8	0	81	0	0	0	81
Cooper Landing	1	1	0	0	0	0	0	0
Cordova	3	3	0	24	0	0	0	24
Craig	2	1	0	0	0	0	0	0
Delta Junction	373	332	9	7,497	0	0	0	7,506
Denali National Park	34	32	2	499	0	0	0	502
Eagle	4	4	0	10	0	0	0	10
Eagle River	425	378	31	4,799	27	0	0	4,857
Eielson AFB	79	67	8	1,408	2	0	0	1,418
Ester	77	69	0	1,209	20	0	0	1,229
Fairbanks	2,868	2,374	95	43,529	469	0	0	44,093
Fort Greely	33	28	1	341	1	0	0	343
Fort Richardson	1	1	0	0	0	0	0	0
Fort Wainwright	106	81	4	1,043	29	0	0	1,076
Fort Yukon	2	1	0	10	0	0	0	10
Gakona	5	4	1	89	0	0	0	90
Galena	1	1	1	15	0	0	0	16
Girdwood	40	35	5	521	0	0	0	526
Haines	4	3	0	0	0	0	0	0

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Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Healy	33	31	2	451	0	0	0	453
Homer	24	18	3	183	0	0	0	185
Houston	6	4	0	56	0	0	0	56
Huslia	2	1	0	2	0	0	0	2
Indian	8	7	0	112	0	0	0	112
Joint Base Elmendorf Richardson	77	57	7	735	32	0	0	774
Juneau	13	10	1	88	0	0	0	90
Kake	1	1	0	0	0	0	0	0
Kaktovik	1	0	0	0	0	0	0	0
Kasilof	1	1	0	0	0	0	0	0
Kenai	10	8	0	75	0	0	0	75
Ketchikan	2	2	0	20	0	0	0	20
Kobuk	2	2	1	38	0	0	0	39
Kodiak	5	2	0	50	0	0	0	50
Kotzebue	2	1	0	44	0	0	0	44
Kwigillingok	1	0	0	0	0	0	0	0
Larsen Bay	1	1	0	5	0	0	0	5
Metlakatla	1	1	0	0	0	0	0	0
Minto	2	1	0	0	0	0	0	0
Moose Pass	1	1	0	6	0	0	0	6
Nenana	32	27	2	373	0	0	0	376
Nikiski	4	3	0	12	0	0	0	12
Ninilchik	2	2	0	0	0	0	0	0
Nome	2	2	0	0	0	0	0	0
North Pole	870	711	45	13,246	49	0	0	13,340
Palmer	600	497	40	7,476	107	0	0	7,624
Petersburg	2	2	0	0	0	0	0	0
Platinum	1	1	0	0	0	0	0	0
Point Hope	1	1	0	16	0	0	0	16
Salcha	57	49	2	765	1	0	0	769
Selawik	1	1	0	0	0	0	0	0
Seward	11	10	2	83	0	0	0	85
Sitka	2	1	0	0	0	0	0	0
Skagway	2	2	0	3	0	0	0	3
Soldotna	23	19	0	178	0	0	0	178
Sterling	6	6	0	30	0	0	0	30
Sutton	67	62	2	1,158	23	0	0	1,183
Talkeetna	26	20	3	352	0	0	0	355
Tok	25	20	0	169	0	0	0	169

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Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Trapper Creek	5	5	0	92	0	0	0	92
Two Rivers	14	12	0	205	0	0	0	205
Unalaska	1	0	0	0	0	0	0	0
Valdez	258	211	6	2,782	33	0	0	2,821
Wasilla	1,126	936	81	16,183	99	0	0	16,362
Willow	56	43	3	742	8	0	0	753
Wiseman	1	1	0	0	0	0	0	0
Wrangell	1	1	0	20	0	0	0	20
Other USA	24	16	2	338	0	0	0	339
Unknown Community	5	4	1	34	0	0	0	35
Subtotal, other communities	**11,308**	**9,264**	**689**	**153,550**	**1,247**	**0**	**0**	**155,487**
Total	**11,353**	**9,301**	**691**	**153,916**	**1,256**	**0**	**0**	**155,863**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 12-6.–Historical subsistence salmon harvests, federal Chitina Subdistrict permits, 2003–2016.

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
2016	128	95	20	1,979	45	0	0	2,044
5-year average (2011–2015)	99	82	15	2,131	24	0	0	2,171
10-year average (2006–2015)	91	69	20	2,124	40	0	0	2,184
Historical average (1989–2015)	92	70	21	1,976	44	0	0	2,041

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 12-7.–Subsistence salmon harvests by community, federal Chitina Subdistrict permits, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Chickaloon	1	0	0	0	0	0	0	0
Chitina	12	10	2	366	2	0	0	371
Copper Center	21	15	3	563	0	0	0	566
Copperville	1	1	0	0	0	0	0	0
Dot Lake	1	0	0	0	0	0	0	0
Gakona	8	7	3	55	0	0	0	58
Glennallen	16	10	5	104	0	0	0	109
Gulkana	2	0	0	0	0	0	0	0
Kennicott	4	3	0	0	0	0	0	0
Kenny Lake	17	14	2	322	11	0	0	335
McCarthy	21	18	0	242	0	0	0	242
Nelchina	1	1	3	13	0	0	0	16
Tazlina	8	5	0	8	0	0	0	8
Tok	13	9	1	221	32	0	0	254
Tonsina	2	2	0	86	0	0	0	86
Total	**128**	**95**	**20**	**1,979**	**45**	**0**	**0**	**2,044**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 12-8.–Historic subsistence salmon harvests, Batzulnetas fishery, 1987–2016.

	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
2016	0	0	0	0	0	0	0	0
5-year average (2011–2015)	3	3	1	243	0	0	0	244
10-year average (2006–2015)	2	2	1	132	0	0	0	133
Historical average (1987–2015)	1	1	0	125	0	0	0	126

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 12-9.–Historical subsistence salmon harvests, Copper River District (Copper River Flats), 1965–2016.

	Permits		Estimated salmon harvest					
Year	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

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Table 12-9.–Page 2 of 2.

Year	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2011	273	263	220	1,839	35	2	0	2,096
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
2016	198	192	75	1,119	0	0	12	1,206
5-year average (2011–2015)	343	324	345	3,142	7	6	4	3,504
10-year average (2006–2015)	376	356	472	3,464	16	5	5	3,962
Historical average (1965–2015)	182	168	248	1,269	109	2	1	1,629

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 12-10.–Subsistence salmon harvests by community, Copper River District (Copper River Flats), 2016

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Anchorage	24	22	1	33	0	0	0	34
Coffman	1	1	0	0	0	0	0	0
Cordova	163	159	67	1,073	0	0	12	1,152
Eagle River	1	1	0	0	0	0	0	0
Fairbanks	1	1	0	0	0	0	0	0
Kodiak	1	1	0	0	0	0	0	0
North Pole	1	1	0	0	0	0	0	0
Palmer	1	1	0	0	0	0	0	0
Tatitlek	2	2	7	13	0	0	0	20
Valdez	1	1	0	0	0	0	0	0
Wasilla	2	2	0	0	0	0	0	0
Total	**198**	**192**	**75**	**1,119**	**0**	**0**	**12**	**1,206**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 12-11.–Historical subsistence salmon harvests, Prince William Sound, Eastern District, 1988–2016.

	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
2016	5	5	0	0	0	0	0	0
5-year average (2011–2015)	16	6	3	529	227	33	0	792
10-year average (2006–2015)	13	4	2	338	158	22	9	530
Historical average (1988–2015)	14	5	1	237	270	41	52	600

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).
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, 1988–2016.

	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
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
2016	7	6	0	32	1	15	0	48
5-year average (2011–2015)	17	7	0	162	16	42	12	233
10-year average (2006–2015)	12	5	1	158	21	58	17	256
Historical average (1988–2015)	12	6	7	233	47	101	120	509

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).
NA = Data not available.

Table 12-14.–Estimated harvests of salmon for home use, Chenega Bay, 2014

	Estimated salmon harvest			
Species	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 household	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, 1960–2016.

	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

-continued-

Table 12-15.–Page 2 of 2.

Year	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
2006	11	9	0	20	30	0	0	50
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
2016	2	2	0	1	0	0	0	1
5-year average (2011–2015)	14	13	6	39	0	14	1	60
10-year average (2006–2015)	10	9	3	28	3	7	1	41
Historical average (1960–2015)	10	7	1	16	24	10	52	103

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).
NA = Data not available.

Table 12-16.–Subsistence salmon harvests by community, Prince William Sound general, 2016.

Community	Permits		Estimated salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Cordova	1	1	0	0	0	0	0	0
Eagle River	1	1	0	1	0	0	0	1
Total	**2**	**2**	**0**	**1**	**0**	**0**	**0**	**1**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 12-17.–Federal Subsistence salmon harvests by community, Prince William Sound/Chugach Subdistrict, 2016.

Community	Permits		Reported salmon harvest					
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Cordova	110	93	0	234	555	0	0	789
Total	**110**	**93**	**0**	**234**	**555**	**0**	**0**	**789**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

CHAPTER 13: THE SOUTHEAST REGION

Introduction

The Southeast region is divided by subsistence regulations 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 six 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. In 2016, permits were available at area offices. Department personnel or authorized designees also usually 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. Beginning in 2016, annual and daily possession limits were specified in regulation; area managers had discretionary authority only to change season length or open areas through issuing emergency orders. Beginning in 2016, . 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. 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 anywhere in the Southeast region; 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 two and six 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; a person cannot possess sport-caught and subsistence-caught/personal use-caught salmon on the same day; salmon taken under personal use or subsistence permits cannot be used for bait in commercial fisheries; 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 2016

In 2016, the total estimated subsistence and personal use salmon harvest for the Southeast region, based on returned permits, was 57,248 fish (Table 13-1). This is above the total estimated harvest for 2015 (48,331 salmon) as well as the most recent 5-year (54,494 salmon), 10-year (55,730 salmon), and historical averages (56,386 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 2016, sockeye salmon contributed the greatest amount to the overall harvest at 47,727 fish (83%), followed by 3,754 pink salmon (7%), 3,598 coho salmon (6%), 1,660 chum salmon (3%), and 508 Chinook salmon (1%) (Table 13-1; Figure 13-2). While the number of each species of salmon harvested differed from the 2015 harvest, the overall contribution of each species to the total harvest did not change significantly: the 2016 harvest was slightly weaker in pink salmon and stronger in chum salmon. Harvests of all species except for pink salmon increased from 2015 estimates. For a comparison, in the commercial fisheries Southeast Alaska, the 2016 total harvest was well below the 10-year average; sockeye and Chinook salmon harvests were above their 10-year averages, while harvests of coho, chum, and pink salmon were below (Conrad and Gray 2017). 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 2016 as well. The estimated subsistence/personal use salmon harvests by management area were as follows: Haines 13,411 (23%), Sitka 13,351 (23%%), Ketchikan 10,214 (18%), Juneau 8,081 (14%), Petersburg 6,823 (12%), and Yakutat 5,368 (9%) (Table 13-3, Figure 13-3). Compared to 2015, harvests in Ketchikan and Yakutat decreased; harvests in the other management areas increased from 2015 harvests, with the largest increase seen in Sitka and Haines estimated harvests.

The number of permits issued per year, on average, for the 10-year time period of 2006–2015, has been 3,221 (Table 13-2). In 2016, a smaller than average number of permits was issued, with a total of 3,175 permits issued and 2,664 returned. This corresponds to a regionwide response rate of 84%, on par with the recent 5-year (88%) and 10-year (84%) averages. In this report, 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 office. 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 continued a slightly decreasing trend and was estimated at 594 in 2016.[1]

Regulations

In the Yakutat area, regulations do not specify daily or annual limits or restrictions to allowable subsistence gear. The weekly subsistence fishing period during the commercial salmon net season is from 6:00 AM Friday to 6:00 PM Saturday. On the Situk River, subsistence fishers are 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 10, 2016 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 2016 was 5,368 salmon, including 3,954 sockeye salmon (74%), 990 coho salmon (18%), 328 Chinook salmon (6%), and 95 pink salmon (2%) (Table 13-3). An estimated 86 permits were fished in the Yakutat Management Area (Table 13-3). Compared to 2015, 12 fewer permits were estimated fished, and overall harvests decreased by slightly over 400 salmon. Most of the decrease came from harvests of sockeye salmon, but pink salmon harvests also decreased slightly; coho, Chinook, and chum salmon harvests remained essentially the same.

Residents of Yakutat were issued 112 subsistence permits, with 92 returned (82%). Fewer permits were fished and a smaller proportion returned than in 2015. The estimated total subsistence salmon harvest for the community of Yakutat in 2016 was 4,842 fish, down from 5,297 salmon in 2015, mostly resulting from a decrease in the sockeye salmon harvest. The 2016 harvest composition was 3,518 sockeye salmon (73%), 906 coho salmon (19%), 324 Chinook salmon (7%), and 94 pink salmon (2%) (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 21, 2018. 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 10, 2016. Accessed August 21, 2018. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/657413598.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)(13)(A)).

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 2016, the combined population of these communities was 3,535, a decrease of approximately 95 individuals over the 2015 estimate.[3] The populations of the Haines Borough and Skagway are predominantly non-Native, while Klukwan has a predominantly Alaska Native population.

Regulations

Regulations for the Haines Management Area limit where salmon may be taken for subsistence uses to the Chilkat River, Chilkat Inlet, Lutak Inlet, and Chilkoot River. These areas combined have the following possession and annual limits: for sockeye salmon, a possession limit of 25 fish and an annual limit of 50 fish; for coho salmon, a possession limit of 20 fish and annual limit of 40; and for pink and chum salmon, combined, a possession limit of 75 fish and an annual limit of 100. The subsistence permit provided for an open season of June 1–September 30. Preseason, a news release announced the closure of the marine subsistence fishery in Chilkat Inlet through July 1, 2016 and in a portion of the Chilkat Inlet from July 2 through July 15 due to a low preseason forecast for Chilkat River king salmon abundance.[4] In addition, the subsistence gillnet fishery in a portion of the Chilkat River was closed from June 15 through July 31. Subsistence salmon fishing is closed in the salt waters of Lynn Canal during closed periods of the commercial salmon net fishery, except subsistence fishing is allowed in a portion of these waters the Saturday before and the day before any commercial drift gillnet openings in the waters of Section 15-A.

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 one 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 2016 was 13,411 salmon, including 11,280 sockeye salmon (84%), 1,127 pink salmon (8%), 632 chum salmon (5%), 357 coho salmon (3%), and 15 Chinook salmon (<1%) (Table 13-3). The overall salmon harvest was approximately 4,000 fish more than the 2015 harvest estimate of 9,151. Harvests of sockeye salmon nearly doubled over the 2015 harvest estimate, while pink salmon decreased by approximately half. Harvests of coho, chum,

3. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. 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 4, 2016. Accessed August 22, 2018. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/650210662.pdf

and Chinook salmon did not change substantially. An estimated 456 permits were fished in the Haines Management Area in 2016, an increase from the 367 estimated permits fished in 2015.

In the Haines Borough, 460 permits were issued and 431 were returned (94%). 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, 12 permits were issued and nine were returned (75%). Thirty residents of Skagway were issued permits and 28 returned them (93%). No permits were issued to Excursion Inlet residents. The estimated salmon harvest by Haines, Klukwan, and Skagway residents combined (12,100 salmon total) included 10,119 sockeye salmon (84%), 1,092 pink salmon (9%), 554 chum salmon (5%), 322 coho salmon (3%), and 13 Chinook salmon (<1%) (Table 13-4). Not all permits were necessarily fished in the Haines area. In 2015, 379 permits were returned and 8,140 salmon in total were reported. Compared to 2015 totals, harvests of sockeye salmon increased the most, nearly doubling in 2015, while harvests of pink salmon decreased the most, by more than 1,000 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 2016 there were an estimated 495 permits fished in the Juneau Management Area with an estimated harvest of 8,081 (Table 13-3). About 30 more permits were fished than in 2015 and approximately 800 more fish were harvested. Sockeye salmon harvests constituted 90% 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 in Basket Bay west of 134 53.88 W. long (5 AAC 01.716 (a)(10)(A), 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 (5 AAC 01.716 (a)(10)), and in waters of Section 13C (5 AAC 01.716 (a)(11)).

The residents of Angoon are the principal subsistence fishers in this area. In 2016, Angoon had a population of 410, a slight decrease over the 2015 population estimate.[5] 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

Possession and annual limits for Angoon area subsistence sockeye salmon fisheries are specified in regulation (5 AAC 01.745 (h) and (g)) and range from a low of 15 fish in possession at Basket Bay to the most liberal areas of Sitkoh Bay and Hasselborg River-Salt Lake with 50 fish in possession and annually. Kanalku, Basket, and Sitkoh bays all opened to subsistence sockeye salmon fishing on June 1, closing first in Kanlaku and Basket bays on July 31 and then at Sitkoh Bay on August 31. Hasselborg River–Salt Lake system was open from July 1–August 15. There is a subsistence coho salmon fishery that occurs in Hasselborg River–Salt Lake from July 1–October 31 with a possession and annual limit of 20 fish. Coho salmon harvested in other streams within the Angoon area could be taken from June 1–October 31, with

5. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. http://live.laborstats.alaska.gov/pop/index.cfm

limits of 20 in possession and 40 annually from all combined streams. Pink salmon could be harvested 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 2016 was 1,353 salmon, including 1,235 sockeye salmon (91%), 92 coho salmon (7%), and 25 pink salmon (2%) (Table 13-3). More sockeye salmon were harvested in 2016 than in 2015 and harvests of coho salmon nearly tripled. The harvest of pink salmon decreased. An estimated 73 permits were fished in the area, compared to 55 permits fished in 2015.

The estimated salmon harvest for the community of Angoon in 2016, based on 91 permits issued and 73 returned (80%), totaled 1,396 salmon, more than double the 2015 harvest estimate. The 2015 harvest comprised 1,203 sockeye salmon (86%), 167 coho salmon (12%), 19 chum salmon (1%), and 13 pink salmon (1%) (Table 13-4). Not all permits were necessarily fished in the Angoon area. The number of permits issued in Angoon in 2016 was similar to the number issued in 2015. Harvest composition of the two years was similar; sockeye salmon harvest accounted for a smaller percent of the total harvest in 2015 and coho salmon a greater percentage.

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 sockeye salmon in 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 (5 AAC 01.716 (a)(11)(B)(i); and a positive C&T finding for salmon other than sockeye salmon in the waters of District 13 (5 AAC 01.716 (a)(11)(A) and in the waters of sections 14B and 14C (5 AAC 01.716 (a)(12)(B)).

The residents of Hoonah are the principal subsistence users of the waters in the area. In 2016, Hoonah had a population of 790, essentially the same as the 2015 estimated population.[6]

Regulations

Possession and annual limits for subsistence sockeye salmon fishing in Hoonah area streams ranged from 10 fish in possession and annually at Neva Creek to 50 fish in possession and annually at Surge and Hanus bays and Hoktaheen Cove (5 AAC 01.745(g)(1)(B) and (h)(1)(B)). The permit specified open seasons 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. Inseason, an emergency order was released which reopened the sockeye salmon subsistence fishery at Hoktaheen Cove, Takanis Bay, and Surge Bay through August 6 due to a trend of later returns of salmon in to the area.[7] 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. 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. Gaffs, spears, beach 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.

6. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. http://live.laborstats.alaska.gov/pop/index.cfm
7. Alaska Department of Fish and Game Division of Commercial Fisheries, "West Yakobi Island subsistence salmon fishery extension announcement," news release, July 22, 2016. Accessed August 22, 2018. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/713758750.pdf

Harvest Assessment Program

The estimated salmon harvest in the Hoonah area subsistence fisheries in 2016 was 293 salmon, significantly less than the 2015 estimate of 2,459 salmon. The 2016 harvest included 233 sockeye salmon (79%), 57 coho salmon (19%), and three chum salmon (1%) (Table 13-3). Harvests of all salmon species decreased compared to 2015, but sockeye salmon harvests decreased the most, from 2,022 salmon harvested in 2015. An estimated 35 permits were fished in the Hoonah area in 2016 in comparison to 105 permits fished in 2015.

For the community of Hoonah, in 2016, 111 permits were issued and 85 were returned (77%) with a total estimated harvest of 1,055 salmon. Permits may not have been fished in the Hoonah area. The harvest consisted of 999 sockeye salmon (95%), 29 pink salmon (3%), 21 coho salmon (2%), and seven chum salmon (1%) (Table 13-4). The same number of permits were issued to Hoonah residents in 2015 and 2016, but the salmon harvest was slightly lower by 100 fish. The harvest of sockeye salmon in 2016 was essentially the same as in 2015, but the number of coho and pink salmon decreased.

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 2016, Gustavus was the largest community with 558 residents. The combined population of the other three communities was 232. Gustavus grew slightly from 2015 while populations in Elfin Cove, Tenakee Springs, and Pelican were unchanged.[8]

Regulations

Permit regulations applying to fishers in this area can be found under the Hoonah, Angoon, Haines, and Juneau subsections.

Harvest Assessment Program

In 2016, the number of salmon reported on permits issued to residents of Elfin Cove, Gustavus, Pelican, and Tenakee Springs was modest (Table 13-4). Twenty-four permits were issued to Gustavus residents, five permits were issued to Pelican residents, 2 permits were issued to residents of Elfin Cove, and one was issued to a Tenakee Springs resident. The majority of these permits were returned. No harvest was recorded on the returned Tenakee Springs permit; an estimated 56 sockeye salmon were harvested in Pelican and nine sockeye salmon in Elfin Cove. Additionally four coho salmon were harvested by Pelican residents and 2 coho salmon by Elfin Cove residents. The estimated harvest for Gustavus was 224 total salmon, a decrease of more than half from 2015, when 517 fish were estimated. The harvest consisted of 209 sockeye salmon (94%), seven coho salmon (3%), four chum salmon (2%) and three pink salmon (1%) (Table 13-4). Not all permits were necessarily fished in the Juneau Management Area.

8. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. http://live.laborstats.alaska.gov/pop/index.cfm

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 32,723, a decrease of several hundred residents since 2015.[9]

Regulations

Regulations specifying annual and possession limits under personal use regulations can be found at 5 AAC 77.682. In the Juneau area, the limit for sockeye salmon in possession in Sweetheart Creek is 25 fish with no annual limit, and in the Taku River the total annual limit is five sockeye salmon for a household of one person and 10 sockeye salmon for a household of two or more people. The Taku River is open to personal use fishing upstream of the Taku River Lodge to the United States/Canada border and only from July 1 through July 31. Sweetheart Creek is open from June 1 through October 31. 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. There is a possession limit of six fish for any coho salmon taken incidentally under the terms of a personal use permit.

In the Taku River only set gillnets could be used, and they could not exceed 15 fathoms in length. The permit holder had to be present at the net while it was in use. In Sweetheart Creek, the use of spearguns and hook and line fishing for salmon was prohibited. 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 2016 was 6,435 salmon, consisting of 5,777 sockeye salmon (90%), 433 pink salmon (7%), 189 coho salmon (3%), 34 Chinook salmon (1%), and 2 chum salmon (<1%) (Table 13-3). This was a higher harvest than the 2015 harvest of 3,815 salmon. Harvests of sockeye salmon increased, while there were small decreases in the estimated harvest of pink and coho salmon. An estimated 387 permits were fished in the Juneau area personal use fisheries in 2016, compared to 306 permits fished in 2015.

The estimated personal use and subsistence salmon harvest for the community of Juneau (including the communities of Douglas and Auke Bay), based on 667 permits issued and 584 returned (88%), totaled 9,076 salmon, including 8,117 sockeye salmon (89%), 506 pink salmon (6%), 335 coho salmon (4%), 80 chum salmon (1%), and 38 Chinook salmon (<1%) (Table 13-4). Not all permits were fished solely in the Juneau area. Similar numbers of permits were issued but fewer were returned in 2016 than in 2015. Overall salmon harvests increased by approximately 2,500 fish. Harvests of sockeye salmon increased by nearly 3,000 fish, driving the overall increase as harvests of coho and pink salmon decreased, and harvest of chum and Chinook salmon increased by a few fish each.

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 Section 13-A south of the latitude of Cape Edward and the waters along the western shore of Yakobi Island east of a line from Cape

9. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. http://live.laborstats.alaska.gov/pop/index.cfm

Spencer light to Surge Bay light, in waters of Section 13-B north of the latitude of Redfish Cape, and in waters of Section 13-C (5 AAC 01.716(a)(11)(B)). 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)(11)(A)). 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 2016, the city and borough of Sitka had a population of 8,914, essentially the same as in 2015.[10] 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

The season for sockeye salmon for all Sitka locations opened June 1 and closed between July 20 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. An emergency order was released July 22, 2016 which reopened the sockeye salmon subsistence fishery at Hoktaheen Cove and Takanis Bay through August 6 due to a trend of later returns of salmon in to the area.[11] 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 vary from 10 fish in possession and 20 fish annually at Gut Bay to 100 fish in possession and no annual limit at Necker Bay (5 AAC 01.745 (g)(1)). Sitkoh, Takanis, Surge, Klag, and Hanus bays, Hoktaheen Cove, and Whale Bay have possession and annual limits of 50 sockeye salmon. Lake Anna, Ford Arm and Ford Arm Lake, 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.

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. In 2016, an emergency order was released on July 14 liberalizing harvest limits in the Redoubt Bay and Lake subsistence fishery to 25 sockeye salmon in possession and 100 sockeye salmon annually.[12]

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 limit of 50 fish and no annual limit. Pink salmon could be harvested from the same waters

10. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. http://live.laborstats.alaska.gov/pop/index.cfm
11. Alaska Department of Fish and Game Division of Commercial Fisheries, "West Yakobi Island subsistence salmon fishery extension announcement," news release, July 22, 2016. Accessed August 22, 2018. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/713758750.pdf
12. Alaska Department of Fish and Game Division of Commercial Fisheries, "Redoubt Bay and Lake subsistence and sport sockeye salmon fishery announcement," news release, July 14, 2016. Accessed August 22, 2018. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/704094208.pdf

under subsistence fishing permit conditions from July 15–September 30, with a possession limit of 100 fish and no annual limit. 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.

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 2016 was 13,351 salmon, consisting of 12,242 sockeye salmon (92%), 548 pink salmon (4%), 375 coho salmon (3%), 170 chum salmon (1%), and 16 Chinook salmon (<1%). This was an increase over the 2015 harvest estimate of 7,110 fish and was similar to the 2014 harvest estimate. Contributions of each species to the overall harvest remained similar. An estimated 405 permits were fished in the Sitka Management Area in 2016, compared to 241 permits in 2015.

As reported in Table 13-4, the estimated salmon harvest for the community of Sitka in 2016, based on 521 permits issued and 456 returned (88%), was 9,846 salmon, including 9,026 sockeye salmon (92%), 420 pink salmon (4%), 310 coho salmon (3%), 80 chum salmon (1%), and 10 Chinook salmon (<1%). Not all permits were necessarily fished solely in the Sitka Management Area. The number of permits issued and returned, as well as overall harvests, increased from 2015. At the species level, harvests of sockeye increased the most (from 6,614 fish in 2015). Harvests of pink, chum, and Chinook salmon also increased, while coho salmon harvests decreased slightly. Four permits were issued to residents of Port Alexander; three were returned providing an estimate of 129 sockeye salmon harvested, similar to the 2015 harvest estimate of 100 sockeye salmon.

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 310 state subsistence permits were fished in the Petersburg Management Area in 2016. The total estimated salmon harvest was 7,817, with 85% of the harvest coming from sockeye salmon (Table 13-3). Approximately 30 more permits were fished in 2016 than in 2015 and about 1,500 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 District 9 north of the latitude of Swain Point (5 AAC 01.716 (a)(8)(A)), in the waters of District 10 west of a line from Pinta Point to False Point Pybus (5 AAC 01.716 (a)(9)(A)), and in the waters of District 5 north of a line from Point St. Albus to Cape Pole (5 AAC 01.716 (a)(4)). 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 2016, Kake had an estimated population of 605, a decrease of 15 residents from 2015 estimates.[13] Kake residents shared the use of the southern coastal waters of Admiralty Island with residents of Angoon and

13. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. http://live.laborstats.alaska.gov/pop/index.cfm

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

The 2016 subsistence salmon permit provided for an open season for sockeye salmon in Alecks Creek and Shipley Bay, Bay of Pillars, Falls Lake, and Gut Bay. The season opened in each of these systems on June 1 and closed between July 20 and August 15. Falls Lake had a closed period between July 13 and 23. Any systems not listed on the permit opened to subsistence sockeye salmon fishing on June 1 and closed July 31. Possession limits detailed in regulation specify possession limits ranging from 10 to 50 fish and annual limits from 20 to 50 fish.

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 2016 was 2,508 salmon, including 2,276 sockeye salmon (91%), 104 pink salmon (4%), 62 chum salmon (2%), 58 coho salmon (2%), and eight Chinook salmon (<1%). An estimated 48 permits were fished in the Kake area subsistence fisheries in 2016. This compares to an estimated 74 permits fished in 2015 with a total harvest of 1,658 salmon. Harvests of all species increased slightly in 2016, except Chinook salmon, which decreased by 8 fish.

The estimated subsistence salmon harvest for the community of Kake in 2016, based on 129 permits issued and 110 returned (85%), was 2,443 salmon. The harvest consisted of 2,242 sockeye salmon (92%), 104 pink salmon (4%), 57 chum salmon (2%), 33 coho salmon (1%), and six Chinook salmon (<1%) (Table 13-4). Not all permits were necessarily fished solely in the Kake area. Fewer permits were issued in 2016 than in 2015 but the total harvest increased from an estimated 2015 harvest of 1,618 salmon. Harvests of sockeye salmon increased the most, from 1,439 salmon in 2015, but harvests of all other species except for Chinook salmon also increased.

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 (excluding enhanced Chinook, chum, and coho salmon within the waters of the Anita Bay Terminal Harvest Area) in District 7 (5 AAC 01.716 (a)(6)) and District 8 (5 AAC 01.716 (a)(7)). These waters include Thoms Place, Harding River, Mill Creek, and the Stikine River. Personal use fisheries are authorized on some salmon stocks in this area that do not have a positive C&T finding.

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

2016, the population of the Petersburg borough (including Hobart Bay CDP and Kupreanof) was 3,177 and that of Wrangell was 2,456.[14] Both estimates are very similar to the 2015 estimates.

Regulations

The 2016 subsistence salmon 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 are 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 2–June 25. Harvest limits are set at six fish daily and 18 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 12 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 six 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 2016 was 1,588 salmon, including 1,499 sockeye salmon (94%), 47 pink salmon (3%), 23 coho salmon (3%), 17 chum salmon (1%), and 2 Chinook salmon (<1%) (Table 13-3). Compared to 2015, the overall harvest was greater. At the species level, sockeye salmon composed a greater proportion of the harvest than in 2015 and coho salmon a smaller proportion. An estimated 76 permits were fished in 2016, 16 more than in 2015.

As reported in Table 13-4, the estimated subsistence/personal use salmon harvest for the community of Petersburg in 2016, based on 173 permits issued and 157 returned (91%), was 2,606 salmon, including 1,989 sockeye salmon (76%), 471 coho salmon (18%), 84 pink salmon (3%), 46 chum salmon (2%), and 16 Chinook salmon (1%). Not all permits were necessarily fished solely in the Petersburg area. More permits were issued in 2016, and the overall salmon harvest was similar to the 2015 harvest. Approximately 100 more sockeye salmon and 250 more coho salmon were harvested in 2016, while slightly fewer fish of the other species were harvested.

As shown in Table 13-3, the estimated salmon harvest in the Wrangell area subsistence/personal use fisheries in 2016 was 1,335 salmon, which included 694 sockeye salmon (52%), 458 coho salmon (34%), 109 chum salmon (8%), 61 pink salmon (5%), and 12 Chinook salmon (1%). Compared to the 2015 harvest estimate of 1,065 salmon, the estimated overall harvest increased, driven almost entirely by an increase in coho

14. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. http://live.laborstats.alaska.gov/pop/index.cfm

salmon harvest from 2 in 2015. Harvest of sockeye salmon decreased from 904 fish in 2015. An estimated 91 permits were fished in 2016 compared to 74 in 2015.

The estimated subsistence salmon harvest for the community of Wrangell in 2016, based on 191 permits issued and 172 returned (90%), was 2,579 salmon, including 2,248 sockeye salmon (87%), 107 chum salmon (4%), 85 pink salmon (3%), 79 coho salmon (3%), and 60 Chinook salmon (2%) (Table 13-4). Not all permits were necessarily fished solely in the Wrangell area. Harvests were greater than the estimated 2015 harvest of 2,395 fish; harvests of sockeye, Chinook, and chum salmon increased by approximately 315 fish, total, from 2015, and harvests of pink and coho salmon decreased.

2016 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. There were no regulatory changes or inseason special actions during the 2016 season.

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 and 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 eight inches.

(A) You may take Chinook salmon from May 15 through June 20. The annual limit is five 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 five and one-half inches, except during the Chinook season when the maximum gillnet mesh size is eight 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 2015, in 2016, 136 fishing permits were issued, with 65% going to Wrangell households and 35% to Petersburg households (Table 13-5). All 136 issued permits were returned and 95 permits recorded fishing activity. The Stikine River subsistence harvest totaled 2,386 salmon, 5% above the 2015 harvest, 19% above the 5-year average harvest, and 68% above the historical harvest (Table 13-6). The 2016 harvest consisted of 2,166 sockeye salmon (91%), 65 pink salmon (3%), 73 coho salmon (3%), 59 Chinook salmon (2%), and 23 chum salmon (1%) (Table 13-6). There were also 11 Dolly Varden char and three steelhead trout harvested.[15] Compared to 2015, a similar number of permit holders caught a similar number of salmon overall. Harvests of sockeye salmon increased while harvests of Chinook, chum, pink, and coho salmon all decreased slightly from 2015.

Residents of Petersburg were issued 47 permits in 2016; all were returned. Based on the permit data, residents of Petersburg harvested 660 salmon in the federal fishery, approximately 28% of the entire harvest. The catch comprised 605 sockeye salmon (92%), 29 pink salmon (4%), 13 Chinook salmon (2%), nine chum salmon (1%), and four coho salmon (1%) (Table 13-5). In Wrangell, based on 89 permits issued and returned, 1,726 salmon were harvested. The catch consisted of 1,561 sockeye salmon (90%), 69 coho salmon (4%), 46 Chinook salmon (3%), 36 pink salmon (2%), and 14 chum salmon (1%) (Table 13-5). Compared to 2015, Petersburg residents harvested 300 fewer fish while Wrangell residents harvested 400 more fish. In Petersburg, harvests of each salmon species declined and in Wrangell only harvests of sockeye salmon, and to a lesser extent, Chinook salmon increased.

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

15. Robert Larson, USFS. Stikine River subsistence salmon fishery: 2016 season summary. United States Department of Agriculture Forest Service, unpublished report, 2016.

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 (5 AAC 01.716 (a)(4)), in the waters of Section 6-A 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)(5)). Harvests in these waters are included in the Petersburg area subsistence-personal use fisheries category in Table 13-3.

In 2016, Point Baker had a population of 14 and Port Protection had a population of 52; both estimates are similar to 2015 estimates.[16]

Regulations

The Point Baker drift gillnet subsistence sockeye salmon fishery occurs in the waters of Sumner Strait within three 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 8–July 31. Only drift gillnet gear, not to exceed 50 fathoms in length, was allowed. Harvest was limited to 25 sockeye salmon 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 is a 100-fish possession limit for pink salmon, with no annual limit. For chum salmon, 50 fish are 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, no permits were issued in Port Protection and 2 were issued in Point Baker. Both permits were returned with a total harvest of four pink salmon (Table 13-4).

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 340 permits fished in the Ketchikan Management Area in 2016, less than the 380 permits fished in 2015. The total estimated salmon harvest was 10,214, approximately 2,000 less salmon than in 2015 (Table 13-3). Sockeye salmon harvests contributed 71% of this harvest; in 2015 sockeye salmon contributed 86% to the overall salmon harvest.

Craig, Klawock, and Hydaburg Subsistence Fisheries

Background and History

Hydaburg area waters with a positive C&T finding for salmon include Section 3-A (5 AAC 01.716(a)(3)(A)) and the waters of District 2 in Nichols Bay north of 54º 42.12′ N lat. (5 AAC 01.716 (a)(2)(B)). Craig–Klawock area waters with a positive C&T finding for salmon include Section 3-B east of a line from Point Ildefonso to Tranquil Point and the waters of 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 (5AAC 01.716 (a)(3)(B)(iii)); and Section 3-C in the waters of Karheen Passage north of 55º 48′ N lat. and east of 133º 20′ W long. and in the waters of Sarkar Cove and Sarkar Lake (5 AAC 01.716 (a)(3)(C)).

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).

16. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. http://live.laborstats.alaska.gov/pop/index.cfm

In 2016, Craig had a population of 1,100, Klawock had a population of 813, and Hydaburg had a population of 404.[17] The population estimate for Craig is lower than in 2015, but estimates for Klawock and Hydaburg are similar.

Regulations

The 2016 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. Karta River, Klakas Lake, and Sarkar were open from June 1 to July 31. The possession limit in each of the three 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 20 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 2016 was 4,540 salmon, including 3,666 sockeye salmon (81%), 644 coho salmon (14%), 166 pink salmon (4%), and 64 chum salmon (1%) (Table 13-3). The 2016 harvest increased from 2,744 fish in 2015. Sockeye and coho salmon harvests increased the most, by 1,400 fish and 330 fish, respectively. Pink salmon harvests also increased slightly, and chum salmon harvests decreased by 10 fish. An estimated 112 permits were fished in the area in 2016, up from 81 fished permits in 2015 and more similar to the 2014 estimate of fished permits

As reported in Table 13-4, 98 permits were issued to residents of Craig and 63 (64%) were returned. The total estimated salmon harvest of Craig residents was 882, 700 fewer fish than the 2015 harvest estimate. By species, the estimated harvest consisted of 725 sockeye salmon (82%), 114 coho salmon (13%), 36 pink salmon (4%), and eight chum salmon (1%). The total estimated salmon harvest for Klawock, based on 94 permits issued and 59 returned (63%), was 3,268 fish, an increase from the 2015 harvest estimate of 2,877 salmon. The 2016 harvest consisted of 2,544 sockeye salmon (78%), 495 coho salmon (15%), 172 pink salmon (5%), and 56 chum salmon (2%). Harvests of sockeye salmon by Klawock residents remained the same as 2015 while harvests of the other three salmon species increased. The total estimated salmon harvest for Hydaburg, based on 49 permits issued and 27 returned (55%), was 769 salmon, the majority of which were sockeye salmon (673; 88%). Hydaburg residents also harvested an estimated 83 coho salmon (11%) and 13 chum salmon (2%). Estimated harvests in 2016 were lower than in 2015 for overall harvest as well as for sockeye, pink, and chum salmon. The coho harvest tripled compared to 2015. Not all harvests by residents of these three communities necessarily occurred in the Craig-Klawock-Hydaburg area.

17. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21,2018. http://live.laborstats.alaska.gov/pop/index.cfm

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)(2)(A)). 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 2016, Coffman Cove had a population of 204, Edna Bay's population was 41, Hollis had a population of 114, Kasaan's population was 89, the population of Naukati Bay was 107, Thorne Bay's population was 530, and the population of Whale Pass was 45.[18] Little population change occurred in these communities since 2015.

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 20 fish annual limit. All streams with a positive C&T determination are 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 is 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 2016 an estimated 73 permit holders fished in the Kasaan area subsistence fisheries with an estimated salmon harvest of 1,580 salmon. In 2015, 149 permits were fished in the area with a harvest of 4,993 fish. The 2016 harvest included 1,087 sockeye salmon (81%), 279 coho salmon (18%), 166 pink salmon (13%), and three chum salmon (<1%). Sockeye salmon harvests in 2016 were a quarter of the estimated 2015 harvest. Pink and chum salmon harvests also decreased, while coho salmon harvest increased from an estimated 83 salmon in 2015.

Based on 13 permits issued to residents of Kasaan and 10 returned (77%) in 2016, an estimated 221 salmon were harvested, the majority consisting of sockeye salmon (186; 84%) as well as 25 coho salmon and 10 pink salmon (Table 13-4). Thorne Bay residents were issued 10 permits, seven of which were returned (70%), resulting in a harvest estimate of 83 sockeye salmon and 17 coho salmon (Table 13-4). One permit was issued to Naukati Bay residents and returned, with no harvest recorded. In Hollis, 22 permits were issued and 17 were returned (77%). An estimated 326 salmon were harvested, including 162 sockeye salmon (50%), 129 pink salmon (40%), 34 coho salmon (10%), and one chum salmon (<1%). In Coffman Cove, five permits were issued and 2 were returned (40%) with no salmon harvest reported. No permits were issued in Whale Pass. Fewer permits were issued in each community. Estimated harvests in all communities except Thorne Bay were smaller in 2016 than in 2015, by 500 fish in Hollis and 150 fish in Kasaan to 50 fish in Naukati Bay; Thorne Bay harvest increased by 25 fish. Not all permits were fished solely in their respective areas.

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

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 within 500 yards of the terminus of Sockeye Creek, and in Hugh Smith Lake (5 AAC 01.716 (a)(1)(B)).[19]

The communities of Ketchikan and Saxman are the principal users of the fisheries in the Ketchikan area. In 2016, the population of the Ketchikan borough, excluding Saxman, was 13,333. Saxman, located within the Ketchikan Gateway Borough, had a population of 416.[20] 2016 estimates show a similar population in both communities as in 2015.

Regulations

Regulations and the 2016 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 20 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 2–June 26, Thursdays through Sundays, with a limit of six sockeye salmon in possession and 18 annually. Other streams in the Ketchikan Management Area that were open to personal use fishing were open June 1–July 31 with a limit of 10 sockeye salmon in possession and a 20 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 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 2016 was 4,094 fish, including 2,462 sockeye salmon (60%), 943 pink salmon (23%), 634 chum salmon (7%), 61 Chinook salmon (1%), and 13 coho salmon (<1%) (Table 13-3). An estimated 155 personal use permits were fished. In comparison, the 2015 harvest was of 3,488 salmon, with a greater percentage of the harvest comprising sockeye salmon and a smaller percentage coming from pink salmon.

As reported in Table 13-4, the total estimated salmon harvest for the community of Ketchikan (including Ward Cove), based on 277 permits issued and 191 returned (69%), was 4,155, including 2,437 sockeye salmon (59%), 904 pink salmon (22%), 615 chum salmon (15%), 159 coho salmon (4%), and 41 Chinook salmon (1%). In Saxman, based on 21 permits issued and 15 returned (71%), a total of 487 salmon were harvested. Of the total, sockeye salmon constituted the largest proportion at 409 fish (84%) followed by pink salmon with 69 fish (414) and 10 chum salmon (2%). Two permits were issued to Metlakatla residents.

19. The positive C&T findings in District 1 include salmon stocks found within the Ketchikan Nonsubsistence Area.
20. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage." Accessed August 21, 2018. http://live.laborstats.alaska.gov/pop/index.cfm

One permit was returned and showed no harvest. More permits were issued in each community, but harvests decreased from 2015 estimates by approximately 250 fish in Ketchikan and remained the same in Saxman. In Ketchikan, the estimated harvest of sockeye salmon decreased by over 1,000 fish, but harvests of the other salmon species increased.

Retention of Salmon Taken in Commercial Fisheries in 2016

Commercial fishermen, both residents and non-residents, may retain legally harvested salmon for their own use including personal consumption or for bait but not for sale (5 AAC 39.010(b)), a practice commonly referred to as "home pack". Any retained fish must be reported on an ADF&G fish ticket at the time of landing (5 AAC 18.355(b). For some households in Southeast Alaska, "home-pack" is the primary source of salmon.

In 2016, commercial fishermen in the Southeast Region reported on fish tickets that they retained for personal or home use a total of 19,078 salmon from their commercial harvests (Table 13-7). This included 9,991 pink salmon (52%), 3,634 coho salmon (19%), 3,197 sockeye salmon (17%), 1,654 Chinook salmon (9%), and 602 chum salmon (3%).

Federal Subsistence Fisheries of the Southeast Region

Federal regulations apply on inland waters within or adjacent to Admiralty Island National Monument, Misty Fjords National Monument, the Tongass National Forest, and Wrangell-St. Elias National Park and Preserve, excluding marine waters except the Makhnati Island Area. Federal C&T determinations have been made for salmon in all waters of the Southeast Region. In the Southeast Region, residents of Juneau and Ketchikan are non-federally qualified users and may not participate in federal subsistence salmon fisheries. A federal permit is required to harvest salmon from federal waters; permits are available from area U.S. Forest Service offices and National Park Service. Regulations concerning the harvest of salmon from federal waters are generally similar to, but in some cases more permissive than, state subsistence regulations. For example, rod and reel is a recognized subsistence gear type under federal regulation. Harvest limits in the federal salmon fishery mirror harvest limits in adjacent state subsistence or personal use fisheries, except for the Stikine River, as detailed above.

In 2016, a total of 342 federal permits were issued and 112 permits were fished (Table 13-8). In total, 1,518 fish were reported harvested under federal subsistence permits, not including the Stikine River harvest earlier reported. The federal subsistence harvest included 679 sockeye salmon, 389 coho salmon, 305 pink salmon, nine chum salmon and three chinook salmon. The federal nonsalmon fish harvest was composed of 63 cutthroat trout, 35 steelhead trout, 32 Dolly Varden, and three rainbow trout.

Other Subsistence Fisheries in the Southeast Region

Residents of Southeast Alaska and Yakutat harvest a diverse assortment of marine species for subsistence uses. Along with salmon, residents harvest many types of finfishes including halibut, sablefish, lingcod, herring, herring eggs, plus many species of marine invertebrates. Halibut, herring eggs, sablefish, eulachon, trout, and crab have permit programs or harvest assessments in place. For those species that do not, the only estimates of subsistence harvests come from periodic household surveys conducted by the Division of Subsistence and are available in an online database, the Community Subsistence Harvest Information System (CSIS)[21]. Subsistence fishing for halibut is managed by the National Marine Fisheries Service. 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 Southeast Alaska region from 2003–2012 (Fall and Koster 2014); 2014 (Fall and Lemons 2016); and 2016 (Fall and Koster 2018). Due to a reduction in funding, since 2012 Pacific halibut subsistence harvest estimates are only collected biannually. While a permit is not required to harvest herring eggs on substrate besides kelp (for which a permit is required), a harvest monitoring program has been in place since 2002 for the harvest of herring eggs from Sitka Sound. Results from that monitoring program can be found in Sill

21. http://www.adfg.alaska.gov/sb/CSIS/

and Cunningham (2017) . For shellfish, under specific situations, permits are required for taking king crab; all other shellfish can be taken without a permit. Regulations concerning subsistence shellfish fisheries can be found at 5 AAC 02.100.

Table 13-1.–Subsistence and personal use salmon harvests by district, Southeast region, 2016.

Fishing location	Name	Permits fished		Estimated salmon harvest					
		Reported	Estimated	Chinook	Sockeye	Coho	Chum	Pink	Total
District 1	Ketchikan-Behm Canal	213	307	41	2,462	13	634	943	4,094
District 2	Clarence Strait-East Prince of Wales Island	92	130	0	1,087	279	3	211	1,580
District 3	Inside Waters-West Prince of Wales Island	158	252	0	3,666	644	64	166	4,540
District 5	Sumner Strait	4	6	0	95	3	4	0	103
District 6	East Sumner Strait-North Frederick Sound	72	84	2	1,404	20	13	47	1,486
District 7	East Etolin Island-Wrangell Island-Ernest Sound	87	107	12	619	4	90	37	762
District 8	Stikine River	47	54	0	75	454	20	24	573
District 9	South Chatham Strait-West Frederick Sound	52	61	8	2,252	58	60	99	2,476
District 10	East Frederick Sound	1	1	0	23	0	2	6	32
District 11	Juneau-Taku Inlet-Stephens Passage	408	465	34	5,777	189	2	433	6,435
District 12	Angoon-North Chatham Strait-East Chichagof	72	88	0	1,235	92	0	25	1,353
District 13	Sitka-Outer Baranof and Chichagof-Peril Strait	527	606	8	11,397	366	110	476	12,357
District 14	Icy Strait-Glacier Bay	50	57	0	233	57	3	0	293
District 15	Lynn Canal-Chilkat Inlet	1,202	1,300	15	11,280	357	632	1,127	13,411
Yakutat Forelands	Yakutat Forelands	1	1	0	1	0	0	0	1

-continued-

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Yakutat Bay-Troll	Yakutat Bay-Troll	120	145	63	3,636	966	0	91	4,756
Yakataga	Yakataga	86	105	265	317	24	0	4	610
Subtotal, state permit fisheries		**–**	**–**	**449**	**45,561**	**3,525**	**1,637**	**3,689**	**54,862**
Stikine River	Stikine River Federal Fishery	95	95	59	2,166	73	23	65	2,386
Total		**–**	**–**	**508**	**47,727**	**3,598**	**1,660**	**3,754**	**57,248**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).
– 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, 1985–2016.

	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
2016	3,175	2,664	508	47,727	3,598	1,660	3,754	57,248
5-year average (2011–2015)	3,372	2,960	844	45,307	3,305	1,197	3,841	54,494
10-year average (2006–2015)	3,221	2,698	1,086	46,781	3,090	1,274	3,499	55,730
Historical average (1985–2015)	3,524	2,481	925	46,807	2,537	2,951	3,166	56,386

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

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 use areas, Southeast region, 2016.

	Permits fished		Estimated salmon harvest					
Area	Reported	Estimated	Chinook	Sockeye	Coho	Chum	Pink	Total
Yakutat Management Area	71	86	328	3,954	990	0	95	5,368
Haines Management Area	423	456	15	11,280	357	632	1,127	13,411
Juneau Management Area	430	495	34	7,245	338	6	459	8,081
Juneau Personal Use Area	340	387	34	5,777	189	2	433	6,435
Angoon Subsistence Area	60	73	0	1,235	92	0	25	1,353
Hoonah Subsistence Area	30	35	0	233	57	3	0	293
Sitka Management Area	316	364	8	11,397	366	110	476	12,357
Petersburg Management Area	276	310	82	6,635	611	211	278	7,817
Petersburg Subsistence-Personal Use Area	64	76	2	1,499	23	17	47	1,588
Wrangell Subsistence-Personal Use Area	76	91	12	694	458	109	61	1,335
Kake Subsistence Area	41	48	8	2,276	58	62	104	2,508
Stikine River Federal Subsistence Fishery	95	95	59	2,166	73	23	65	2,386
Ketchikan Management Area	229	340	41	7,215	936	701	1,320	10,214
Ketchikan Personal Use Area	108	155	41	2,462	13	634	943	4,094
Kasaan Subsistence Area	51	73	0	1,087	279	3	211	1,580
Craig-Klawock-Hydaburg Subsistence Area	70	112	0	3,666	644	64	166	4,540
Total	–	–	**508**	**47,727**	**3,598**	**1,660**	**3,754**	**57,248**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).
– 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, Southeast region, 2016.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Akhiok	2	1	0	0	0	0	0	0
Anchorage	14	12	0	89	4	0	1	93
Angoon	91	73	0	1,203	167	19	7	1,396
Auke Bay	4	4	1	41	2	22	0	66
Barrow	3	2	0	210	0	0	0	210
Coffman Cove	5	2	0	0	0	0	0	0
Craig	98	63	0	725	114	8	36	882
Denali National Park	1	1	1	14	0	0	0	15
Douglas	47	47	3	430	51	0	15	499
Eagle River	2	1	0	0	0	0	0	0
Elfin Cove	2	2	0	9	2	0	0	11
Fairbanks	18	16	0	263	12	3	0	279
Gustavus	24	22	0	209	7	4	3	224
Haines	460	431	13	9,275	297	533	943	11,060
Hollis	22	17	0	162	34	1	129	326
Homer	1	0	0	0	0	0	0	0
Hoonah	111	85	0	999	21	7	29	1,055
Hydaburg	49	27	0	673	83	13	0	769
Juneau	616	533	34	7,646	282	58	491	8,511
Kake	129	110	6	2,242	33	57	104	2,443
Kasaan	13	10	0	186	25	0	10	221
Ketchikan	274	188	41	2,437	159	615	904	4,155
Klawock	94	59	0	2,544	495	56	172	3,268
Klukwan	12	9	0	388	13	17	13	432
Metlakatla	2	1	0	0	0	0	0	0
Naukati Bay	1	1	0	0	0	0	0	0
Palmer	4	4	0	2	0	0	0	2
Pelican	5	5	0	56	4	0	1	61
Petersburg	173	157	16	1,989	471	46	84	2,606
Point Baker	2	2	0	0	0	0	4	4
Port Alexander	4	3	0	129	0	0	0	129
Saxman	21	15	0	409	0	10	69	487
Sitka	521	456	10	9,026	310	80	420	9,846
Skagway	30	28	0	456	12	4	135	608
Tenakee Springs	1	1	0	0	0	0	0	0
Thorne Bay	10	7	0	83	17	0	0	100
Trapper Creek	1	1	0	35	0	0	3	38
Ward Cove	3	3	0	0	0	0	0	0
Wasilla	2	1	0	30	0	0	0	30

-continued-

Table 13-4.–Page 2 of 2.

	Permits		Estimated salmon harvest					
Community	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Wrangell	191	172	60	2,248	79	107	85	2,579
Yakutat	112	92	324	3,518	906	0	94	4,842
Total	**3,175**	**2,664**	**508**	**47,727**	**3,598**	**1,660**	**3,754**	**57,248**

Source ADF&G Division of Subsistence, ASFDB 2017 (ADF&G 2018).

Table 13-5.–Subsistence salmon harvests by community for the Federal Stikine River subsistence salmon fishery, Southeast region, 2016.

	Permits		Estimated salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
Petersburg	47	47	13	605	4	9	29	660
Wrangell	89	89	46	1,561	69	14	36	1,726
Total	**136**	**136**	**59**	**2,166**	**73**	**23**	**65**	**2,386**

Source M. Hutten, USFWS, unpublished data, 2017.

Table 13-6.–Historic subsistence salmon harvests for the Federal Stikine River subsistence salmon fishery, Southeast region, 2004–2016.

Year	Permits issued	Estimated salmon harvest					
		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	125	71	1,844	131	46	171	2,263
2016	136	59	2,166	73	23	65	2,386
5-year average (2011–2015)	127	75	1,614	122	63	126	2,000
Historical average (2006–2015)	96	57	1,151	85	44	86	1,422

Source M. Hutten, USFWS, unpublished data, 2017.

Table 13-7.–Salmon removed from commercial catch for home use, Southeast region, 2016.

Year	Number of Permits	Salmon harvest					
		Chinook	Sockeye	Coho	Chum	Pink	Total
2016	463	1,654	3,197	3,634	602	9,991	19,078

Source ADF&G fish ticket database.

Table 13-8.–Subsistence salmon harvests, other Southeast Alaska federal subsistence fisheries, 2016.

Year	Permit	Permits issued	Permit used	Dolly Varden	Cutthroat trout	Steelhead	Rainbow trout	Chinook	Sockeye	Coho	Chum	Pink
2016	SE General	254	86	31	39	4	3	3	679	389	9	305
2016	POWKI[a] - Spring	64	22	1	23	29						
2016	POWKI[a] - Winter	24	4		1	2						

Source Federal Subsistence Management System Permits Database.

a. Prince of Wales and Kosciusko Islands steelhead trout fishery.

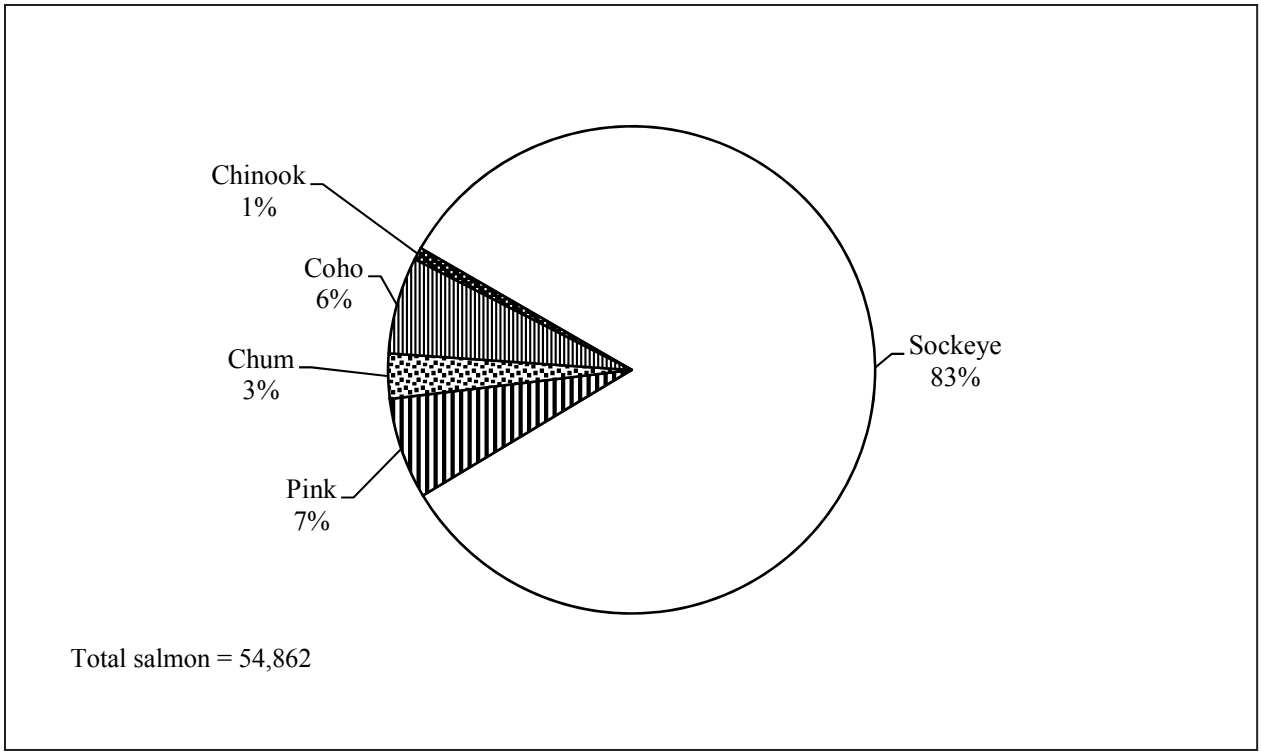

Figure 13-1.–Southeast region subsistence and personal use harvests by species, 2016.

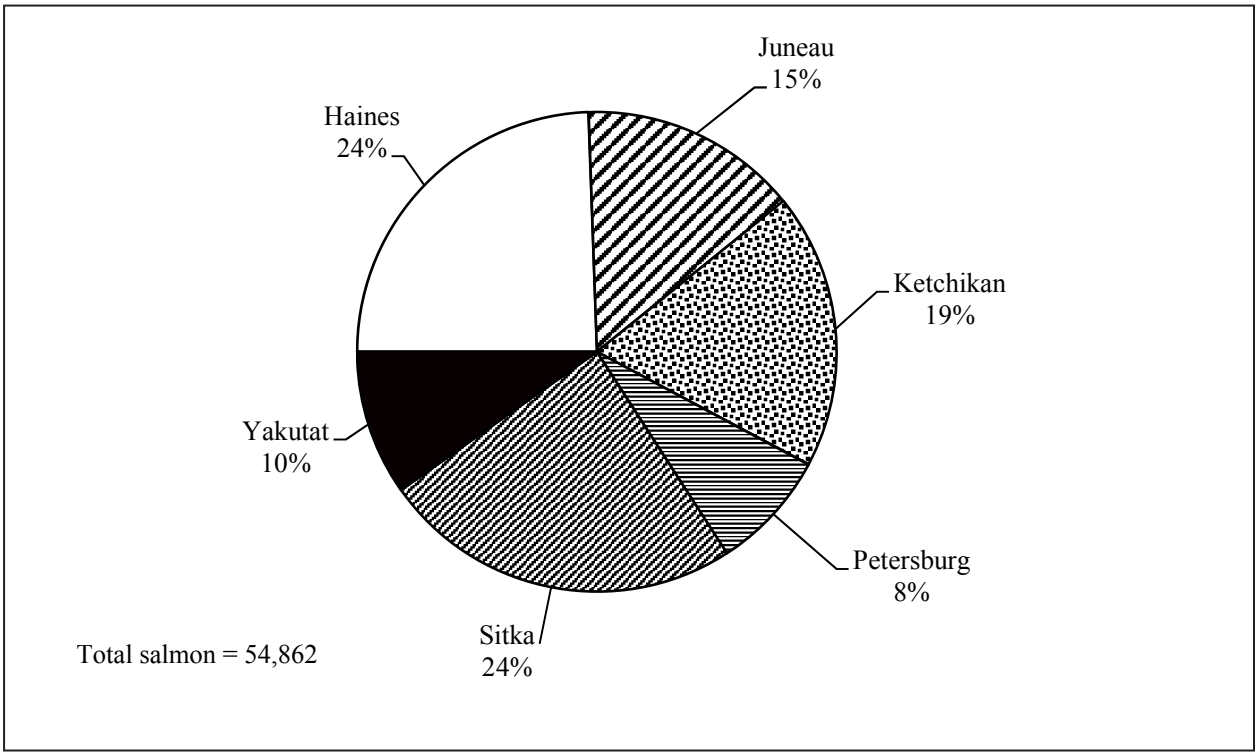

Figure 13-2.–Total salmon harvested by management area, Southeast region, 2016.

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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.

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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 2016 is the result of the work of a number of Division of Subsistence staff. Former division employees Dave Caylor, Jeannie Heltzel, and Brian Davis, and current employee David Koster helped design and update the Alaska Subsistence Fisheries Database. Data for 2016 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, Brooke McDavid, 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 18th 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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