

Subsistence Harvest Assessment of Salmon and Local Traditional Knowledge of Chinook Salmon in the Chignik Management Area, 2014–2016

by

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and

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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

<i>all atomic symbols</i>	
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
mid-eye-to-fork	MEF
mid-eye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

<i>all standard mathematical signs, symbols and abbreviations</i>	
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 ₀
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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TRADITIONAL KNOWLEDGE OF CHINOOK SALMON IN THE
CHIGNIK MANAGEMENT AREA, 2014–2016**

by

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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

The Chignik River supports the largest run of Chinook salmon on the south side of the Alaska Peninsula. All five species of Pacific salmon found in Alaska *Oncorhynchus spp.*—Chinook *O. tshawytscha*, sockeye *O. nerka*, coho *O. kisutch*, chum *O. keta*, and pink *O. gorbuscha*—are used for subsistence by Chignik Management Area (CMA) residents. This study investigated the subsistence uses and harvests of salmon in the CMA communities of Chignik Lake, Chignik Lagoon, Chignik Bay, and Perryville from 2014–2016. Data were collected in person using household harvest and assessment surveys as well as key respondent interviews. This report presents the data collected from the surveys, which show an overall decline in the amount and size of all salmon returning to the CMA area. The run timing of each species was also identified as having changed in recent years.

Analysis of data collected from key respondent interviews included reasons stated by community members for the decline of Chinook salmon in the CMA area. Participants in all communities identified ineffective state management of salmon stocks, inadequate regulations for ocean trawlers, and a changing global climate as reasons for diminishing salmon returns. The study was a collaboration between the Alaska Department of Fish and Game, Division of Subsistence; Bristol Bay Native Association, Natural Resources Department; and the councils of the study communities' tribes—Chignik Bay Tribal Council, Native Village of Chignik Lagoon, Chignik Lake Village, and Native Village of Perryville; as well as the Oregon State University Department of Anthropology for study year three data collection. The Chinook Salmon Research Initiative program study was funded largely under the Dingell-Johnson Act (D-J), the Alaska Sustainable Salmon Fund (AKSSF), and the Pacific Salmon Commission's (PSC) Chinook Technical Committee's Letter of Agreement (ADF&G Chinook Salmon Research Team 2013).

Key words: Chignik River, Chignik Management Area, Chinook salmon, king salmon, sockeye salmon, coho salmon, chum salmon, Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville, subsistence fisheries, commercial fisheries, processing salmon, fisheries management, climate change, Alaska Department of Fish and Game

1. INTRODUCTION

Chinook salmon *Oncorhynchus tshawytscha* are important to subsistence, commercial, and sport users throughout Alaska and Chinook salmon stocks (also commonly called “king salmon”; these two names are used interchangeably in this report) have been declining statewide resulting in hardships, both economic and social, for rural and urban Alaska communities. The Alaska Department of Fish and Game (ADF&G) manages all commercial Pacific salmon *Oncorhynchus spp.* fisheries within the Chignik Management Area (CMA; Area L). The CMA encompasses all coastal waters and inland drainages of the northwest Gulf of Alaska between Kilokak Rocks and Kupreanof Point (Figure 1-1). The Chignik River is the largest Chinook salmon-producing stream on the southern shore of the Alaska Peninsula and the only stream that supports a substantial escapement in ADF&G’s CMA (ADF&G Chinook Salmon Research Team 2013:30; Wilburn and Stumpf 2017:11). The Chignik River watershed is extensive and consists of both the marine and fresh waters of Chignik Lagoon, Chignik River, Chignik Lake, Black Lake, and several tributaries (Figure 1-2). In addition to Chinook salmon, the watershed supports two genetically distinct, but temporally overlapping, runs of adult sockeye salmon *O. nerka* and produces most of the sockeye salmon harvested for commercial and subsistence in the CMA (Wilburn and Stumpf 2017:5, 9). The Chignik River watershed also provides spawning habitat for coho *O. kisutch*, pink *O. gorbuscha*, and chum *O. keta* salmon.

Chinook salmon, as well as the other four species of salmon, are important components of the local economy for the communities that are situated within the CMA: Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville, and Ivanof Bay, and commercial fishing is the economic mainstay for these communities (Wilburn and Stumpf 2017:5). Chignik River Chinook salmon generally enter the Chignik River in early June; the run peaks by mid-July and is over by mid- or late August. The Chignik River Chinook salmon biological escapement goal (BEG) range is 1,300–2,700 fish from the average run (1978–2011) of 5,500 spawners (ADF&G Chinook Salmon Research Team 2013:30; Wilburn and Stumpf 2017:11). Escapement estimates, however, of spawning Chinook salmon to the Chignik River have been in gradual decline since 2006—with the lower BEG not achieved in 2013—and at the low end of the escapement goal for more years than not since 2006 (Wilburn and Stumpf 2017:33). Purse seines and hand purse seines are the only legal commercial salmon fishing gear allowed within the CMA (5 AAC 15.330). Commercial harvests of Chignik River-bound Chinook salmon, including incidental catches, are highly variable from year to year and dependent on the duration and timing of the sockeye salmon commercial fishery openers (ADF&G Chinook Salmon Research Team 2013:30, 55). Most Chinook salmon harvests occur in the CMA’s Chignik Bay District. Chinook salmon in the Chignik River are harvested under the rules of the subsistence and sport fisheries and Chinook salmon are also harvested incidentally in the Chignik River watershed, primarily in Chignik Lagoon, by the commercial CMA sockeye salmon purse seine fishery. Chinook salmon of undetermined stock origin are also harvested incidentally by commercial fishermen who fish outside the Chignik watershed, and a few migrating Chinook salmon are harvested by subsistence fishers off the beach near the community of Perryville (Figure 1-1).

Many residents from the CMA communities hold detailed knowledge of the saltwater and freshwater species and environments proximal to their homes; their knowledge was developed over generations of collected observations and experiences harvesting salmon and other wild resources. This report summarizes residents’ observations of changes in the local Chinook salmon stock, and perceived causes of those changes to explore declining annual Chinook salmon returns to spawn in the Chignik River and a decline in the overall Chinook salmon stock of the region. Specifically, participants were asked their understanding of why the Chignik River Chinook salmon run is in decline, what changes they have observed in Chinook salmon, and to identify potential solutions to the decline or additional avenues of research. Additionally, for this project the ADF&G Division of Subsistence gathered salmon harvest and use data from study participants for all salmon species for 2014, 2015, and 2016. Study participant households were chosen from the CMA communities of Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville. The community of Ivanof Bay, with an estimated population of seven residents according to the 2010 federal census, was not included due to high project and survey administration costs relative to the population of that community (U.S. Census Bureau n.d.).

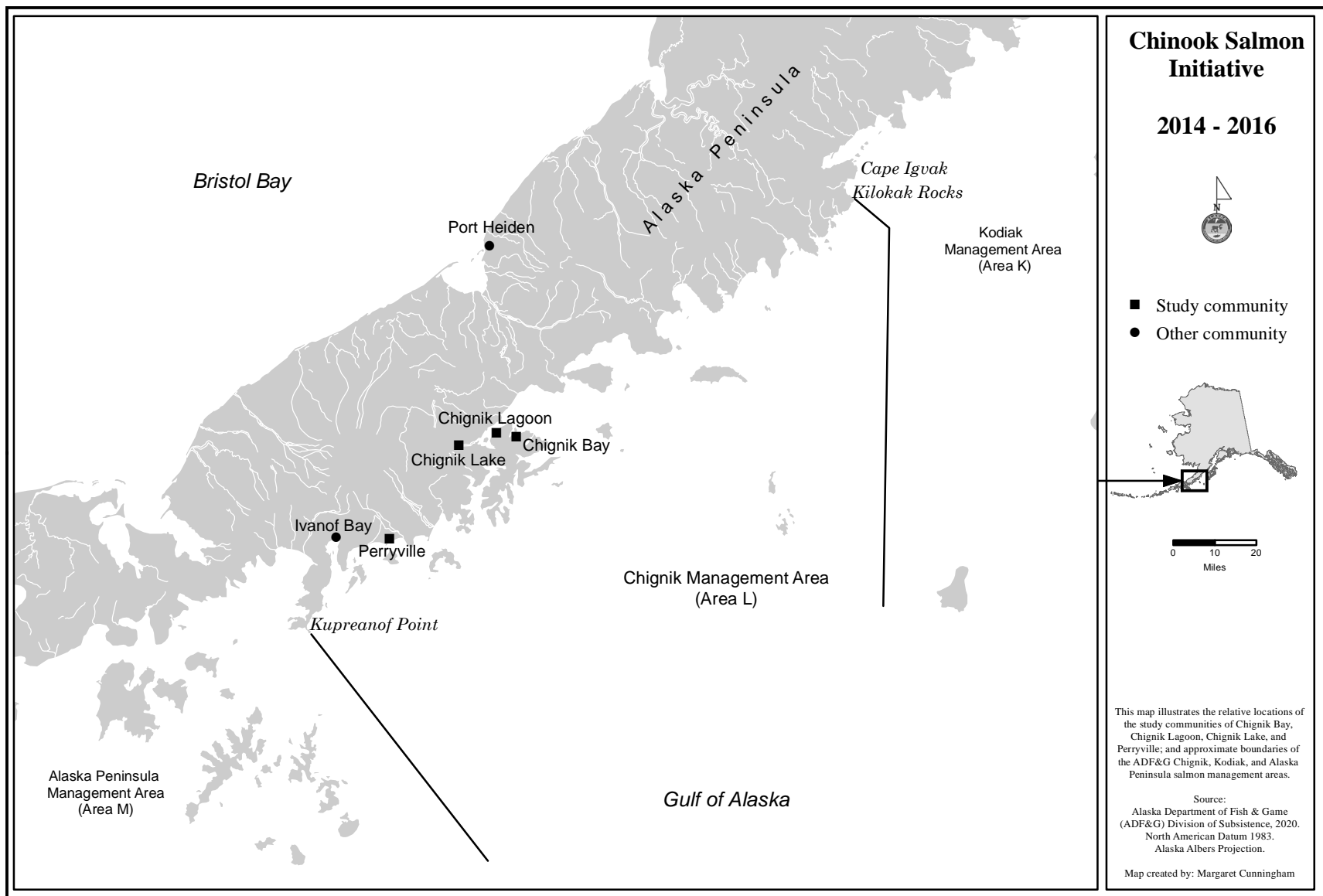


Figure 1-1.—Map of study communities, 2013.

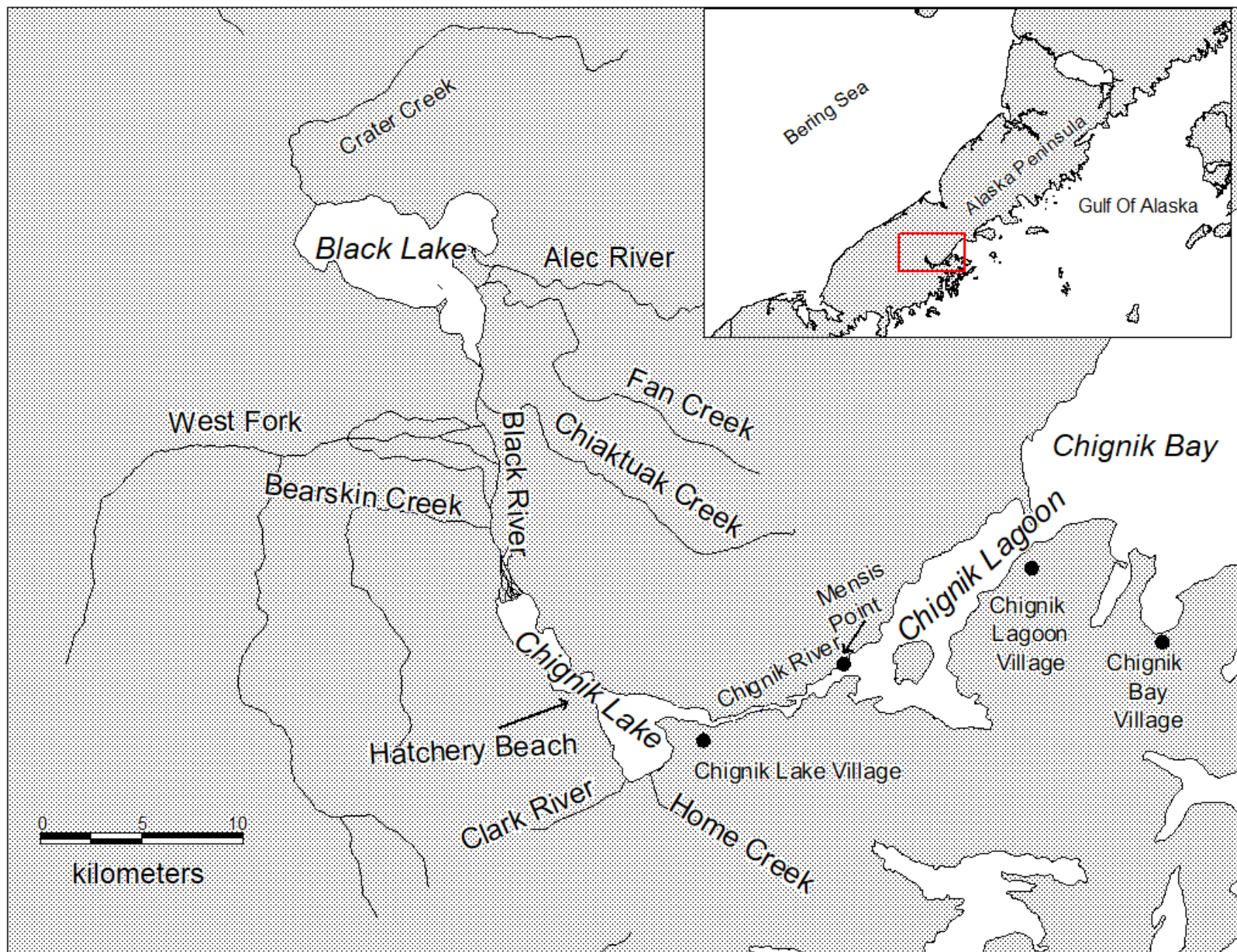


Figure 1-2.—Map of bodies of water in the Chignik River watershed.

PROJECT BACKGROUND

This study was part of the Alaska Chinook Salmon Research Initiative (CSRI) program. The State of Alaska, through the support of the governor and Alaska State Legislature, launched this initiative in 2012, which provided money for state and federal agencies, academia, and non-governmental organizations to assess the issue of declining Chinook salmon productivity and abundance. Weak runs for Chinook salmon had been returning to many Alaska rivers for a prolonged period, with widespread shortfalls persisting since 2007 (ADF&G Chinook Salmon Research Team 2013:6–8). Chinook salmon declines affect subsistence, commercial, and sport fishing opportunities. This prompted ADF&G to host the 2012 Chinook Salmon Symposium to identify knowledge gaps and research needs concerning salmon, the result of which was the creation of the *Chinook Salmon Stock Assessment and Research Plan, 2013* (ADF&G Chinook Salmon Research Team 2013). The research team that published the plan identified substantial Chinook salmon knowledge gaps throughout Alaska: stock assessments using inshore harvest data and escapement enumeration, as well as smolt abundance data; marine survey data and salmon life history process information; and local and traditional knowledge. The plan identified the Chignik River watershed and 11 other Alaska watersheds as systems hosting Chinook salmon indicator stocks and suggested studies to fill statewide data gaps. Each indicator stock was chosen to fill Chinook salmon information gaps, better understand factors for Chinook salmon stock declines, and improve management capabilities. The ADF&G Chinook Salmon Research Team recommended that, for each Chinook salmon indicator stock, there be stock assessment studies implemented. There were nine suggestions for improving stock assessment capabilities; facets of two of those suggestions were incorporated into research efforts by the Division of Subsistence for the Chignik indicator stock: comprehensively estimate annual total harvests of Chinook salmon and provide adequate local and traditional knowledge (LTK) concerning patterns and trends of use (ADF&G Chinook Salmon Research Team 2013:12–14).

For the Chignik River Chinook salmon stock specifically, the management team identified four areas of study: improve the existing subsistence harvest monitoring and assessment program; estimate the age-sex-size composition of adult Chignik River Chinook salmon; estimate smolt abundance of the Chignik River stock; and, lastly, estimate the regional origin of fish harvested in marine waters in the Chignik and South Peninsula management areas (ADF&G Chinook Salmon Research Team 2013:31).¹ The Division of Subsistence proposed research in response to the need for improving monitoring of subsistence harvests of CMA Chinook salmon. Salmon harvests in the CMA are estimated from annual permit returns and, in years when funding has allowed, postseason household surveys have been conducted in the CMA communities. The last year funding was available to conduct postseason household surveys was 2011. What follows in the remainder of this project background section is an overview of the harvest assessment program, which bears significant relevance to this research, and study development chronology.

Chignik Management Area Annual Subsistence Harvest Assessment Program

Only Alaska residents may subsistence fish for salmon (see 5 AAC 01.010(b)). The Division of Commercial Fisheries conducted its first subsistence salmon harvest assessment in the CMA in 1976 and managed the subsistence harvest monitoring program from 1976–1992 (Fall et al. 2019:122). Beginning in 1980, any fishers who chose to harvest their subsistence salmon from the CMA had to obtain a permit. Annual estimates of CMA subsistence salmon harvests are based on annual permit returns. 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 Division of Subsistence assumed responsibility of the harvest assessment program from 1993–2011. However, the permits issued prior to 1980 and for 1987, when the Division of Commercial Fisheries ran the program, could not be located. Data from returned permits were tabulated by species and fishing area and, since 1993, harvest data from returned permits have been expanded by community of residence to estimate the harvest by all permit holders.

1. Results from a genetic analysis study are published in Witteveen and Shedd (2016).

In the CMA, in addition to permit data, for 1993–2008 and 2011 (and 2014–2016 as part of this project), postseason subsistence salmon harvest surveys were conducted in each of the study communities to supplement harvest data collected through returned permits. Division of Subsistence staff and local research assistants (LRAs) from each community, who were trained and hired by the Division of Subsistence, administered these postseason surveys face-to-face. Household survey respondents were asked harvest questions like those included on the permit, as well as additional questions regarding late-season harvests and whether their subsistence needs were met. If a person had not returned a permit prior to being asked to conduct the survey, the permit was collected at that time if it could be located; if the permit could not be located, the harvest data collected on the survey were applied to the person's permit harvest report. In cases where a permit was returned before all salmon were harvested, the survey captured additional, late-season salmon harvests that were added to the person's permit. In many instances, survey participants had not obtained a permit prior to subsistence fishing; if this was the case, the survey participant was issued a postseason ex post facto permit and the harvest data collected on the household survey were added to the permit harvest report.

The harvest data collected from the postseason surveys were compiled and reconciled with the permit data, and an annual harvest estimate was calculated based on the expanded permit estimates integrated with additional household survey data not initially accounted for on permits. This resulted in a more reliable estimate of harvests of all species of salmon in the CMA subsistence fishery. Based on findings from postseason surveys that not all subsistence fishing households obtain permits each year, it is likely that harvests for 2009, 2010, 2012, and 2013 were underestimated because limited funding prevented administering household surveys in those years. To compensate for this underestimate, the average annual harvest from postseason surveys for 1999–2008 and 2011 was added to harvests from returned permits to estimate the total subsistence harvest for 2009, 2010, 2012, and 2013 (Fall et al. 2019:131). The Division of Subsistence has published reports that include annual salmon permit harvest results (see the latest annual report for 2017 results by Fall et al. [2020]) and has also conducted several previous subsistence research studies in the CMA. Results from sporadic household surveys and subsistence salmon ethnography studies have been published (Fall et al. 1995; Hutchinson-Scarborough et al. 2016; 2020; 2020; Hutchinson-Scarborough and Fall 1996; Morris 1987).

Note that starting in 2012, the Division of Commercial Fisheries resumed the responsibility of administering the harvest assessment program due to funding losses for the Division of Subsistence. During this project's study years (2014–2016), permits were available annually at the ADF&G Kodiak regional office and the Chignik River weir, as well as at Trident Seafoods in Chignik Bay and from vendors (usually the tribal administrators) in Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville. CMA subsistence salmon permits were not due to be returned by fishers through the mail to ADF&G until December 31 of the year in which the permit was issued. Subsistence fishers used permits to document salmon harvested by species, date, and location. Permit holders who did not return their permits were sent individual reminder letters from the ADF&G Kodiak office. In the study communities, subsequent postseason surveys were conducted by the Division of Subsistence.

Project Planning and Approvals

The initial setup of this project began in July 2013, which was several months following the publication of the research plan for the CSRI program. The first Investigation Plan (IP) submitted by the Division of Subsistence to address data gaps for the Chignik River watershed proposed reinstating postseason household surveys for 2013 salmon harvests and conducting key respondent interviews with active harvesters. The IP indicated that, if future funding became available, the study plan could be implemented annually for the duration of the CSRI program. However, due to limited staff capacity at the time for conducting research to collect data after the 2013 fishing season, the project was delayed. Later, following receipt of project funding appropriations, the Division of Subsistence was able to proceed with conducting postseason household surveys for salmon harvests for 2014 and 2015, and also conducting key respondent interviews (KRIs) to collect LTK for study year 2014.

ADF&G Division of Subsistence staff Lisa Hutchinson-Scarbrough, Subsistence Resource Specialist (SRS) II, and Meredith Marchioni, SRS III, were the Principal Investigators (PIs) for study year 2014; Hutchinson-Scarbrough was the sole PI for study year 2015. Prior to the start of fieldwork, in September 2014, PI Hutchinson-Scarbrough mailed, emailed, and also faxed the council president and council members of each federally recognized Alaska Native tribe in the communities of Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville to inform them of the project. The PI asked for verbal or written approval to visit the communities in November 2014 to provide a project overview presentation to council members and other interested community residents, and conveyed the intent to, if approved, identify and hire LRAs and immediately commence with household surveys and KRIs. The more standard process of taking a separate trip to introduce the project and get approval prior to the commencement of fieldwork was not planned for three primary reasons: the project budget was insufficient to provide for researcher travel to each community to conduct a separate information meeting; verbal approval to immediately proceed with study methods was provided by the tribal president of each study community's council; and, lastly, PI Hutchinson-Scarbrough had conducted numerous subsistence research projects in these communities for the Division of Subsistence over the course of 24 years and established an excellent rapport and mutual trust with each of these communities. These relationships were reinforced during a recent three-year ethnographic study conducted by PIs Hutchinson-Scarbrough and Marchioni.²

Table 1-1 identifies the dates that project information meetings were held in the study communities; these meetings introduced the project for two study years because, at that time, funding was already approved for the 2014 and 2015 study years. The PIs, Hutchinson-Scarbrough and Marchioni, along with Eric Schacht—an ADF&G intern and student at the University of Alaska—traveled to the study communities and presented project information and acquired final approval to conduct research in each community. Based on recommendations from the village councils, local researchers were identified, hired, and trained to assist with fieldwork; also, fishers and other residents who were knowledgeable about Chinook salmon were identified as potential key respondents to be interviewed. The information meetings covered a brief overview of the CSRI program, reasons for and methods of research, and a review of questions included in the household surveys and protocol to guide semi-structured KRIs. Additionally, researchers briefly reviewed the principles of ethical research and answered meeting participant questions. The two-year timeline to complete research for 2014 and 2015 harvests was also discussed, and researchers advised community attendants of the possibility of future research occurring only if more CSRI program funding became available.

Subsequently, the Alaska State Legislature approved additional monies for continuing Chinook salmon research, and this allowed for a third year of surveys and second year of KRIs to be conducted for this project in 2017 for the 2016 study year. Hutchinson-Scarbrough remained the sole PI for the project for study year 2016. Data collection for 2016 occurred in conjunction with another compatible subsistence research project funded through the U.S. Fish and Wildlife Service (USFWS), Office of Subsistence Management (OSM). The 2016 Fisheries Resource Monitoring Program project *Subsistence Salmon Networks in Select Bristol Bay and Alaska Peninsula Communities, 2016* (Hutchinson-Scarbrough et al. 2020)—also referred to in this report as the “sharing network project”—focused on salmon harvests and sharing by the residents of the same CMA study communities participating in the CSRI research as well as Port Heiden and Egegik. The sharing network project was conducted by the Division of Subsistence along with partner researchers from both Bristol Bay Native Association (BBNA) and Oregon State University (OSU), Department of Anthropology. Both the sharing network and CSRI projects shared several parallel research methods, including household salmon harvest surveys and KRIs for 2016. The PIs for both projects agreed to integrate research methods and collaborate on data collection efforts, including household surveys and KRIs, as well as data analysis efforts for both projects to minimize respondent burden and economize use of project funds from two funding sources. Because of the sharing network project and the additional year of funding that was acquired for the Chinook salmon research project, there was enough funding for holding dedicated project information overview meetings in each community prior to scheduling field research. Table 1-2

2. Results from the ethnographic study were published in Hutchinson-Scarbrough et al. (2016).

Table 1-1.—Staff and community member attendance, 2014 and 2015 project information meetings.

Community	Date	Attendance		
		Community residents	Staff	Staff affiliation
Chignik Bay	11/18/2014	18	Lisa Hutchinson-Scarborough	ADF&G staff
			Eric Schacht	ADF&G student intern
Chignik Lagoon	11/12/2014	10	Lisa Hutchinson-Scarborough	ADF&G staff
			Meredith Marchioni	ADF&G staff
			Eric Schacht	ADF&G student intern
Chignik Lake	11/10/2014	6	Lisa Hutchinson-Scarborough	ADF&G staff
			Meredith Marchioni	ADF&G staff
			Eric Schacht	ADF&G student intern
Perryville	11/14/2014	9	Lisa Hutchinson-Scarborough	ADF&G staff
			Eric Schacht	ADF&G student intern

Table 1-2.—Staff and community member attendance, 2016 project information meetings; and, 2014 and 2015 preliminary study results information meetings.

Community	Date	Attendance		
		Community residents	Staff	Staff affiliation
Chignik Bay	11/14/2016	12	Lisa Hutchinson-Scarborough	ADF&G staff
			Cody Larson	BBNA staff
			Amy Wiita	ADF&G staff
Chignik Lagoon	11/11/2016	6	Lisa Hutchinson-Scarborough	ADF&G staff
			Cody Larson	BBNA staff
			Amy Wiita	ADF&G staff
Chignik Lake	11/15/2016	8	Lisa Hutchinson-Scarborough	ADF&G staff
			Cody Larson	BBNA staff
			Amy Wiita	ADF&G staff
Perryville	11/13/2016	8	Lisa Hutchinson-Scarborough	ADF&G staff
			Cody Larson	BBNA staff
			Amy Wiita	ADF&G staff

identifies the dates that meetings were held in each of the CMA study communities that participated in both the CSRI and sharing network projects. Each community meeting presented information about the sharing network project and third year of fieldwork for the CSRI project, and also a review of the 2014 and 2015 household survey data results from the first two CSRI project study years. Resolutions of support to proceed with research were acquired from each village council after the project information meetings were held (Hutchinson-Scarborough et al. 2020:389–392).

As indicated in Table 1-3, which lists project staff for all three study years, coordinating efforts over multiple years required a large team of researchers and LRAs who assisted with identifying resident households, contacting households to be surveyed, assisting research staff with surveys and KRIs, providing logistical support for rural travel, and other necessary tasks for successful project implementation. Many LRAs assisted throughout the study years as well as ADF&G resource specialists, analysts, and student interns. Staff who conducted fieldwork for 2016 included ADF&G resource specialists and staff from the sharing network project's research partner agencies BBNA and OSU. Additionally, administrative support, quantitative data entry and analysis, qualitative data entry (i.e., interview transcription), and report development were supported by other ADF&G staff (Table 1-3).

STUDY OBJECTIVES

- Estimate the harvest for home use of Chinook and other salmon species in 2014, 2015, and 2016 by Chignik Area communities, including subsistence nets, rod and reel, and retention from households' commercial harvests, including number of fish by species, gear type, and date of harvest.
- Map where each species of salmon was caught in each study year.
- Document fishers' knowledge of the Chinook salmon decline and perceived causes for this decline.

RESEARCH METHODS

Ethical Principles for the Conduct of Research

Aligned with all research conducted by the Division of Subsistence, this project was guided by the research principles outlined in the *Alaska Federation of Natives Guidelines for Research*³ and by the *Principles for the Conduct of Research in the Arctic* (Social Science Task Force, U.S. Interagency Arctic Research Policy Committee 1995), the *Ethical Principles for the Conduct of Research in the North* (Association of Canadian Universities for Northern Studies 2003), as well as the Alaska confidentiality statute (AS 16.05.815). These principles stress community approval of research designs, informed consent, anonymity or confidentiality of study participants, community review of draft study findings, and the provision of study findings to each study community upon completion of the research.

Data Collection

This project collected both quantitative and qualitative data to evaluate potential improvements to the existing annual subsistence harvest data monitoring program. The ADF&G Chinook Salmon Research Team (2013:13–14) recommended comprehensively estimating annual total harvest of Chinook salmon and providing adequate LTK concerning patterns and trends of use of Chinook salmon; these recommendations guided the research methods employed during this project, each of which is described in this section.

Systematic Household Surveys

The primary method for collecting subsistence harvest and use information in this project was a systematic, in-person household survey. A key goal was to structure the survey instrument to collect demographic data, and salmon harvest and use data that are comparable with 1) information collected in previous household

3. Alaska Federation of Natives. "Alaska Federation of Natives Guidelines for Research," Alaska Native Knowledge Network, <http://ankn.uaf.edu/IKS/afnguide.html> (last modified August 15, 2006, accessed February 25, 2014).

Table 1-3.—Project staff.

Task	Name	Years	Organization
Statewide Research Director	Jim Fall	2013–2020	ADF&G Division of Subsistence
Regional Program Manager	Davin Holen	2013–2015	ADF&G Division of Subsistence
	Brian Davis	2016–2017	ADF&G Division of Subsistence
	Robin Dublin	2018–2021	ADF&G Division of Subsistence
	Lisa Hutchinson-Scarborough	2013–2021	ADF&G Division of Subsistence
Principal Investigator	Meredith Marchioni	2013–2015	ADF&G Division of Subsistence
Administrative Support	Zayleen Kalalo	2015–2020	ADF&G Division of Subsistence
	Vanessa Oquendo	2014	ADF&G Division of Subsistence
	Lehua Otto	2015–2016	ADF&G Division of Subsistence
	Jennifer Severance	2015–2017	ADF&G Division of Subsistence
	Pam Amundson	2017–2021	ADF&G Division of Subsistence
Data Management Lead	David Koster	2013–2015, 2017–2021	ADF&G Division of Subsistence
	Megan Hellenthal	2016	ADF&G Division of Subsistence
Programmer	Margaret Cunningham	2014–2016	ADF&G Division of Subsistence
Data Entry	Margaret Cunningham	2014–2015	ADF&G Division of Subsistence
	Alex DePue	2016	ADF&G Division of Subsistence, student intern
	Nick Jackson	2014–2015	ADF&G Division of Subsistence
	Zayleen Kalalo	2014–2015	ADF&G Division of Subsistence
	Erica Mitchell	2015	ADF&G Division of Subsistence, student intern
	Vanessa Oquendo	2015	ADF&G Division of Subsistence
	Lehua Otto	2016–2017	ADF&G Division of Subsistence
	Anna Petersen	2016	ADF&G Division of Subsistence, student intern
	Kayla Schommer	2014	ADF&G Division of Subsistence, student intern
	Margaret Cunningham	2015–2021	ADF&G Division of Subsistence
	Nick Jackson	2014	ADF&G Division of Subsistence
	Margaret Cunningham	2015–2021	ADF&G Division of Subsistence
Data Analysis—Quantitative	David Koster	2016–2021	ADF&G Division of Subsistence
	Terri Lemons	2015–2017	ADF&G Division of Subsistence
	Erica Mitchell	2015	ADF&G Division of Subsistence, student intern
	Lisa Hutchinson-Scarborough	2015–2021	ADF&G Division of Subsistence
Data Analysis—Qualitative	Meredith Marchioni	2015	ADF&G Division of Subsistence
	Susan Finch	2018–2019	Vendor
Interview Transcriptions	Lisa Hutchinson-Scarborough	2018–2021	ADF&G Division of Subsistence
	Alex DePue	2018–2019	ADF&G Division of Subsistence, student intern
	Margaret Cunningham	2015–2021	ADF&G Division of Subsistence
Cartography	Margaret Cunningham	2015–2021	ADF&G Division of Subsistence
Editorial Review Lead	Mary Lamb	2019–2021	ADF&G Division of Subsistence

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Table 1-3.--Page 2 of 2.

Task	Name	Years	Organization	Community
Field Research Staff	Margaret Cunningham	2016	ADF&G Division of Subsistence	Chignik Lake
	Andrew Gerkey	2017	Oregon State University, Dept. of Anthropology	Chignik Bay, Chignik Lake, Chignik Lagoon, Perryville
	Cody Larson	2017	Bristol Bay Native Association	Chignik Bay, Chignik Lake, Chignik Lagoon, Perryville
	Lisa Hutchinson-Scarbrough	2014–2017	ADF&G Division of Subsistence	Chignik Bay, Chignik Lake, Chignik Lagoon, Perryville
	Meredith Marchioni	2014	ADF&G Division of Subsistence	Chignik Lagoon, Chignik Lake
	Erica Mitchell	2016	ADF&G Division of Subsistence, student intern	Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville
	Shane Scaggs	2017	Oregon State University, student intern	Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville
	Eric Schacht	2014	ADF&G Division of Subsistence, student intern	Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville
	Amy Wiita	2017	ADF&G Division of Subsistence	Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville
Local Research Assistants	Billy Anderson	2017	Chignik Bay Tribal Council	Chignik Bay
	Ilane Ashby	2016	Chignik Bay Tribal Council	Chignik Bay
	Debbie Carlson	2014	Chignik Bay Tribal Council	Chignik Bay
	Angela Daugherty	2014, 2017	Chignik Bay Tribal Council	Chignik Bay
	Minnie Skonberg	2016	Chignik Bay Tribal Council	Chignik Bay
	Melissa Stangel	2017	Chignik Bay Tribal Council	Chignik Bay
	Jody Anderson	2014	Native Village of Chignik Lagoon	Chignik Lagoon
	Michelle Anderson	2014	Native Village of Chignik Lagoon	Chignik Lagoon
	Jeremy Billadeau	2016	Native Village of Chignik Lagoon	Chignik Lagoon
	Alvin Pedersen	2016, 2017	Native Village of Chignik Lagoon	Chignik Lagoon
	Hannah Overton	2017	Native Village of Chignik Lagoon	Chignik Lagoon
	Justin Smith	2017	Native Village of Chignik Lagoon	Chignik Lagoon
	Mitchell Lind, Jr.	2016	Chignik Lake Village Council	Chignik Lake
	Mitchell Lind, Sr.	2014, 2016, 2017	Chignik Lake Village Council	Chignik Lake
	Richard Takak	2016	Chignik Lake Village Council	Chignik Lake
	Daniel Kosbruk	2017	Native Village of Perryville	Perryville
	Jaylon Kosbruk	2014, 2016	Native Village of Perryville	Perryville
	Taylor Lind	2017	Native Village of Perryville	Perryville
	Desire Shangin	2014, 2016	Native Village of Perryville	Perryville
	Victoria Tague	2017	Native Village of Perryville	Perryville

surveys in these communities, 2) data collected on CMA annual subsistence permits, and 3) data in ADF&G's Community Subsistence Information System (CSIS⁴) database. Appendix A is an example of the survey instrument used in this project; the example in the appendix was used for the 2015 study year. The standard survey form remained relatively the same for all three study years, though some of the open-ended assessment questions about salmon use changed based on the need for additional information regarding use of sockeye salmon specifically from the early and late runs. Also, for 2016, additional research questions were added to the survey form to accommodate the sharing network project objectives; the results for the additional research questions asked for the sharing network project are not included in this report but can be found in Hutchinson-Scarborough et al. (2020).

The household survey asked respondents to provide basic demographic information, including number of people in the household, ages, gender, relationships to the head of household, and how many years each member had lived in the community. Salmon resource harvest and use data were collected by asking respondents to report the number of salmon harvested by species, gear type, date, and location of harvest (spatial data collection methods are described in more detail below). Commercial fishing households were asked how many salmon were removed from commercial harvests for home use (referred to as "home pack"), including how many salmon were given away to other households or crew members. Estimated salmon harvests by study community households are reported in numbers of salmon and in pounds usable weight; the estimates include resources harvested by any member of the surveyed household during the study year. "Use" of salmon means any fish harvested, given away, or used by a household, and salmon acquired from other harvesters. Households were also asked if they used, gave away, or received salmon. Those households that used salmon were asked whether their use of specific salmon resources was less, the same, or more that year compared to recent previous years; if use was less or more, households were asked, "Why was your use different?" and they were also asked if they got enough to meet their needs. Additionally, the household survey included a series of questions regarding stock health, salmon behavior, and escapement for Chinook salmon; sockeye salmon; and coho, pink and chum salmon combined (referred to as "other salmon"). The survey form for all study years asked respondents to provide additional questions, comments, or general concerns regarding local resources or resource management. Researchers took notes as surveys were executed to record valuable qualitative information to complement responses to survey form answers. All respondents were informed that, in accordance with research principles, to maintain anonymity their names would not be included in this report.

Each community in the study was defined using U.S. Census Bureau boundaries. Eligible households were defined as those living within the community for at least three months in the study year. A census of all households was attempted for each community. During every survey effort, a disposition was applied to each residence that researchers attempted to contact. The disposition categories included:

- Household contains residents who are eligible to participate in the survey based on length of residency (three months or more): survey was attempted.
- Household occupants are nonresident based on length of residency (less than three months): survey was not conducted.

If researchers were initially unsuccessful at contacting an eligible household, at least two more attempts to survey the household were made. When a reasonable effort was made to survey the household and no contact could be made, this household was assigned a "no contact" disposition.

In 2014, sample achievement ranged from 64% of households interviewed in Chignik Lagoon to 87% of households interviewed in Perryville (Table 1-4). Refusal rates of households declining to participate in the survey ranged from 0% in Chignik Bay and Chignik Lake to 6% in Chignik Lagoon. Completing a survey took from a minimum of five minutes to a maximum of 1 hour and 21 minutes; the average survey length spanned 14–31 minutes for all communities combined (Table 1-5).

4. ADF&G Community Subsistence Information System: <http://www.adfg.alaska.gov/sb/CSIS/> (hereinafter cited as CSIS).

Table 1-4.—Estimated households and sample achievement, study communities, 2014–2016.

Sample information	Chignik Bay			Chignik Lagoon			Chignik Lake			Perryville		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Number of dwelling units	30	32	26	25	26	25	32	31	26	39	39	39
Interview goal	30	29	27	25	26	26	26	29	33	39	39	37
Households interviewed	25	22	24	16	19	20	19	28	28	34	33	26
Households failed to be contacted	5	5	2	8	5	5	7	1	4	4	4	4
Households declined to be interviewed	0	2	1	1	2	1	0	0	1	1	2	7
Households moved or occupied by nonresident	0	3	4	0	0	0	6	2	2	0	0	8
Total households attempted to be interviewed	30	29	27	25	26	26	26	29	33	39	39	37
Refusal rate	0.0%	8.3%	4.0%	5.9%	9.5%	4.8%	0.0%	0.0%	3.4%	2.9%	5.7%	21.2%
Final estimate of permanent households	30	29	27	25	26	26	26	29	33	39	39	37
Percentage of total households interviewed	83.3%	75.9%	88.9%	64.0%	73.1%	76.9%	73.1%	96.6%	84.8%	87.2%	84.6%	70.3%
Interview weighting factor	1.20	1.32	1.13	1.56	1.37	1.30	1.37	1.04	1.18	1.15	1.18	1.42
Sampled population	64	54	68	45	56	55	55	72	84	99	100	77
Estimated population	76.8	71.2	76.5	70.3	76.6	71.5	75.3	74.6	99.0	113.6	118.2	109.6

Source ADF&G Division of Subsistence household surveys, 2015–2017.

Table 1-5.—Survey duration, study communities, 2014–2016.

Community	Study year	Interview length (in minutes)		
		Average	Minimum	Maximum
Chignik Bay	2014	14	5	37
	2015	25	9	88
	2016	39	8	130
Chignik Lagoon	2014	31	15	81
	2015	51	12	135
	2016	44	12	105
Chignik Lake	2014	25	6	65
	2015	37	5	114
	2016	41	10	112
Perryville	2014	22	10	50
	2015	32	6	69
	2016	41	8	85

Source ADF&G Division of Subsistence household surveys, 2014–2017.

In 2015, sample achievement ranged from 73% of households interviewed in Chignik Lagoon to 97% of households interviewed in Chignik Lake (Table 1-4). Refusal rates of households declining to participate in the survey ranged from 0% in Chignik Lake to 10% in Chignik Lagoon. Completing a survey took from a minimum of five minutes to a maximum of 2 hours and 15 minutes; the average survey length spanned 25–51 minutes for all communities combined (Table 1-5).

In 2016, sample achievement ranged from 70% of households interviewed in Perryville to 89% of households interviewed in Chignik Bay (Table 1-4). Refusal rates of households declining to participate in the survey ranged from 3% in Chignik Lake to 21% in Perryville, which was the highest refusal rate for any community in any study year. Completing a survey took from a minimum of eight minutes to a maximum of 2 hours and 10 minutes; the average survey length spanned 39–44 minutes for all communities combined (Table 1-5).

Mapping Locations of Fishing Activities

During household interviews, the researchers asked respondents to indicate the locations of their fishing activities during the study year. In addition, interviewers asked the respondents to mark on maps the sites of each harvest, the species harvested, the amounts harvested, and the months of harvest. ADF&G staff established a standard mapping method. Points were used to mark harvest locations of salmon caught by any gear type (except commercial removals) during the study year. Some lines or polygons were also drawn in order to depict when the harvesting activity did not occur at a specific point; for example, lines were used to depict courses taken while seining or trolling for fish.

Fishing areas and harvest locations were documented on iPads⁵ using a data collection application developed by HDR, Inc., an environmental research firm located in Anchorage, using ArcGIS Runtime SDK for iOS. The ESRI (Environmental Systems Research Institute) ArcGIS Collector application was customized for Division of Subsistence data collection needs. Search and harvest area markings were drawn on a U.S. Geographical Survey topographic relief map downloaded on the iPad. The iPad allowed the user to zoom in and out to the appropriate scale, and the ability to document harvesting activities wherever they occurred in the state of Alaska. Once a feature was input, an attribute box was filled out by the researcher that noted the species harvested, the amounts harvested, month(s) of harvest, how the harvest area was accessed, and harvest method. Once data collection was complete, the data were uploaded using WiFi through ArcGIS Online to the ESRI cloud server for storage. Researchers did note that when using the electronic tool for data collection, respondents at times marked a general location and not an entire area where harvest efforts occurred. For example, a point feature might have been input that marked a general area where purse seine gear was used by the respondent when a polygon feature could have been input to mark an entire area where purse seine fishing occurred.

Paper maps were also available to be used as a reference for respondents or for collecting spatial data. These maps were 11x17-inches at a scale of 1:250,000 and 1:500,000 and only documented the area within the survey area. Very few paper maps were used, and research staff digitized markings on paper maps using the iPad application. Once a survey was complete, researchers conducted a quality control exercise by matching the map data to the survey form to ensure all map data had been documented. Note that, particularly if the WiFi connection was unstable, the research team experienced problems while uploading data and later concluded that some collected data were lost. The communities and years where this occurred include: Chignik Bay (2016), Chignik Lagoon (2014 and 2016), Chignik Lake (2014 and 2016), and Perryville (2015). The quality control exercise, which helped to identify data losses, was completed before the surveys were submitted to the Information Management section at the Division of Subsistence.

Key Respondent Interviews

Using household surveys, assessments were collected to document local knowledge about Chinook salmon from residents of the study communities in the CMA regarding stock health, salmon behavior, and

5. Product names are given because they are established standards for the State of Alaska or for scientific completeness; they do not constitute product endorsement.

escapement. Another research method—key respondent interviews—was implemented to gather further local knowledge to provide context for the data recorded on surveys as well as to address the fourth study objective. LTK can be useful for providing context to stock downturns and evidence of long-term changes in local environmental conditions and correlations between biological and climatic events (ADF&G Chinook Salmon Research Team 2013:14). LTK was collected to provide a broader knowledge base for fishery managers working to strengthen Chinook salmon runs statewide. During both semi-structured and non-structured KRIs, researchers focused on learning about patterns and trends of use of the Chignik Chinook salmon stock, including long-term changes in the biology of fish (e.g., size, appearance, behavior); local environmental conditions; habitat changes; cyclic, natural, and uncommon seasonal variations; run timing; and management of Chinook salmon.

While researchers were in study communities, they consulted with representatives of the tribal council of each community as well as LRAs to identify people to interview about Chinook salmon who were subsistence, commercial, or sport fishermen, or knowledgeable elders. In addition, PIs Hutchinson-Scarbrough and Marchioni, after having recently completed a subsistence ethnography in these communities for 2010–2012, had some respondents in mind who they thought could provide valuable insight about Chinook salmon.

During the 2014 and 2016 research study years combined, there were 38 KRIs conducted with 30 respondents: 22 semi-structured, in-depth, audio-recorded interviews; and 16 non-structured interviews. There were not any KRIs conducted in 2016 for the 2015 study year due to budget, time, and staff limitations. ADF&G PIs Hutchinson-Scarbrough and Marchioni conducted the interviews in 2014 while household surveys were administered for the 2014 study year. In 2017, for the 2016 study year, Hutchinson-Scarbrough conducted a total of 10 in-depth KRIs in all four communities combined, eight of which—two in each study community—were done in conjunction with KRIs being conducted for the sharing network project described earlier. Combining interviews was prudent because many of the recommended respondents for the sharing network project were the same informants Hutchinson-Scarbrough identified to be interviewed for the Chinook salmon research project. Though the interview protocols differed for each project, they also sought responses on some of the same topics; as a result, it was beneficial to gather information jointly for the two studies.

All interviews were conducted with the permission of the informant. Recorded, semi-structured interviews were guided by a pre-established interview protocol (Appendix B). This protocol was developed by PIs Hutchinson-Scarbrough and Marchioni for the collection of local and traditional knowledge about Chinook salmon based on the study objectives—particularly the fourth objective. Interviews were conducted using an open-ended approach: residents were asked general, neutral questions that usually led to respondents addressing more specific topics. The shorter, non-structured interviews generally were not voice recorded; instead, researchers documented input from respondents in hand-written notes that were near-verbatim accounts of what respondents said. These non-structured interviews often only touched on specific topics the informant was particularly knowledgeable about, such as describing how Chinook salmon are processed, or abundance of Chinook salmon in a particular location 50 years ago.

In addition to gathering qualitative data through the KRI protocol, ADF&G staff also took notes during the household surveys, KRIs, and community data review meetings to provide additional context to findings for this report. Recorded interviews were transcribed verbatim. All respondents were informed that, in accordance with research principles, to maintain anonymity their names would not be included in this report. Key respondents received a small stipend to thank them for their contributions to the project and sharing their knowledge.

Commercial Fish Ticket and Subsistence Salmon Permit Data

The Division of Commercial Fisheries collects fish tickets when commercial salmon harvests are delivered to fish processors. The number of commercially caught salmon retained for home use is reported on fish tickets and recorded in *OceanAK*, an Oracle database maintained by ADF&G.

The Division of Commercial Fisheries (Kodiak office location) was responsible for issuing permits to subsistence fishers, providing permits to vendors in study communities, compiling returned permits, and

obtaining the list of permits issued from the vendors. For any permits issued that were not returned, the Division of Commercial Fisheries mailed reminder letters to the permit holder. When these permits were received, they were included in the above-mentioned harvest assessment program process. The Division of Commercial Fisheries then sent all returned permits and permit rosters to the Division of Subsistence Information Management team, where data were entered into a database.

Household Survey Implementation

Table 1-6 depicts the dates field research occurred in each study community for each study year, as well as the names of project staff who participated in each field research trip. Fieldwork timing and household survey sample achievement are summarized below. LRAs were helpful and their efforts contributed to attaining generally high sample achievement in each community for every study year: in all but two instances, 73% or more households were sampled. Unless otherwise noted, before leaving a community, surveys were reviewed in the field for completeness and clarity by researchers who then coded surveys in preparation for data entry.

Chignik Bay

2014 Study Year

During November 18–19, 2014, one researcher and one student intern with the Division of Subsistence conducted field research in Chignik Bay (Table 1-6). Training for two LRAs was conducted on November 18. The two ADF&G staff members each worked with one of the LRAs to contact households and conduct the household surveys. Surveys went quickly without issues: 83% of all households were surveyed (Table 1-4). Out of a total of 30 households, 25 were surveyed, and five were unable to be contacted.

2015 Study Year

During February 4–5, 2016, one researcher and one student intern with the Division of Subsistence conducted field research in Chignik Bay (Table 1-6). Training for two LRAs was conducted on February 4. The two ADF&G staff members each worked with one of the LRAs to contact households and conduct the household surveys. Surveys were completed in two days without issues and 76% of all households were interviewed (Table 1-4). Out of a total of 29 households, 22 were surveyed and five were unable to be contacted. Two households (8%) declined to be surveyed; this was the highest participation refusal rate for this community during the three years of survey administration.

2016 Study Year

During February 14–17, 2017, two researchers from the Division of Subsistence, a researcher and student intern from OSU, and one researcher from BBNA conducted fieldwork in Chignik Bay (Table 1-6). Training with three LRAs was conducted on February 15. Four researchers and the student intern each worked with an LRA to contact the households and conduct the household surveys. Despite snowy, inclement weather, during the four days of fieldwork 89% of households were surveyed (Table 1-4). Out of 27 total households, 24 were surveyed, two failed to be contacted, and one household (4%) declined to participate.

Chignik Lagoon

2014 Study Year

During November 12–14, 2014, two researchers and one student intern with the Division of Subsistence conducted field research in Chignik Lagoon (Table 1-6). Training for two LRAs was conducted on November 12. Each researcher and the student intern worked with one of the LRAs to contact households and conduct the household surveys. There were, unfortunately, a higher number of households than usual that were out of town during the days of the survey so only a 64% sample was achieved (Table 1-4). Out of a total of 25 households, 16 were surveyed, eight were unable to be contacted (most being out of town), and one household declined to be surveyed.

Table 1-6.—Research staff, local research assistants, and survey administration dates listed by study year and community, 2014–2016.

Community	Dates	Staff	Local research assistants
<i>2014</i>			
Chignik Bay	11/18 to 11/19, 2014	L. Hutchinson-Scarborough and E. Schacht	D. Carlson and A. Daugherty
Chignik Lagoon	11/12 to 11/14, 2014	L. Hutchinson-Scarborough, M. Marchioni, and E. Schacht	J. Anderson and M. Anderson
Chignik Lake	11/10 to 11/12, 2014	L. Hutchinson-Scarborough, M. Marchioni, and E. Schacht	M. Lind, Sr.
Perryville	11/14 to 11/18, 2014	L. Hutchinson-Scarborough and E. Schacht	J. Kosbruk and D. Shangin
<i>2015</i>			
Chignik Bay	2/4 to 2/5, 2016	L. Hutchinson-Scarborough and E. Mitchell	I. Ashby and M. Skonberg
Chignik Lagoon	2/1 to 2/3, 2016	L. Hutchinson-Scarborough and E. Mitchell	J. Billadeau and A. Pedersen
Chignik Lake	1/26 to 1/29, 2016	L. Hutchinson-Scarborough, M. Cunningham, and E. Mitchell	M. Lind, Sr., M. Lind, Jr., and R. Takak
Perryville	1/29 to 1/31, 2016	L. Hutchinson-Scarborough and E. Mitchell	J. Kosbruk and D. Shangin
<i>2016^a</i>			
Chignik Bay	2/14 to 2/17, 2017	L. Hutchinson-Scarborough, C. Larson, A. Wiita, A. Gerkey, and S. Scaggs	B. Anderson, A. Daugherty, and M. Stangel
Chignik Lagoon	2/17 to 2/20, 2017	L. Hutchinson-Scarborough, C. Larson, A. Wiita, A. Gerkey, and S. Scaggs	H. Overton, A. Pedersen, and J. Smith
Chignik Lake	2/11 to 2/14, 2017	L. Hutchinson-Scarborough, C. Larson, A. Wiita, A. Gerkey, and S. Scaggs	M. Lind, Sr.
Perryville	2/6 to 2/11, 2017	L. Hutchinson-Scarborough, C. Larson, A. Wiita, A. Gerkey, and S. Scaggs	T. Lind, D. Kosbruk, and V. Tague

a. 2016 study year combined with the Bristol Bay sharing networks project.

2015 Study Year

During February 1–3, 2016, one researcher and one student intern with the Division of Subsistence conducted field research in Chignik Lagoon (Table 1-6). Training for two LRAs was conducted on February 1. The two staff from ADF&G, including one student intern, each worked with one of the LRAs to contact households and conduct the household surveys. Out of a total of 26 households, 19 (or 73%) were interviewed (Table 1-4). There were five households that were not contacted and two declined to participate.

2016 Study Year

During February 17–20, 2017, two researchers from ADF&G Division of Subsistence, one researcher and one student intern from OSU, and one researcher from BBNA conducted fieldwork in Chignik Lagoon (Table 1-6). Training with three LRAs was conducted on February 18. Four researchers and the student intern each worked with an LRA to contact households and conduct the household surveys and 77% of all households were surveyed (Table 1-4). Out of 26 households in the community, 20 households were surveyed, five were unable to be contacted, and one household declined to participate.

Chignik Lake

2014 Study Year

During November 10–12, 2014, two researchers and one student intern with the Division of Subsistence conducted field research in Chignik Lake (Table 1-6). Training for one LRA was conducted on November 10. All three staff from ADF&G worked with the one LRA or worked independently—being very familiar with this community and not in need of assistance to contact households—and conducted household surveys. There were several households out of town during the survey and 73% of all households were surveyed (Table 1-4). Out of a total 26 households, 19 were interviewed, and seven were unable to be contacted but no households declined to participate in the survey.

2015 Study Year

During January 26–29, 2016, one researcher, one analyst, and one student intern from the Division of Subsistence conducted field research in Chignik Lake (Table 1-6). Training for three LRAs was conducted on January 27. The staff from ADF&G, including one student intern, each worked with one of the LRAs to contact households and conduct the household surveys. Surveys went quickly without issues and 97% of all households were surveyed (Table 1-4). Out of a total 29 households, all but one was surveyed; the one household not surveyed was not contacted during three separate attempts.

2016 Study Year

During February 11–14, 2017, two researchers from ADF&G Division of Subsistence, one researcher and one student intern from OSU, and one researcher from BBNA conducted fieldwork in Chignik Lake (Table 1-6). Training with one LRA was conducted on February 12. Four researchers and the student intern each worked with the one LRA or worked independently—being very familiar with this community and not in need of assistance—to contact households and conduct the household surveys. During the four days of fieldwork, 85% of 33 total households were surveyed: 28 households were surveyed, four of the five other households were unable to be contacted, and one declined to participate (Table 1-4).

Perryville

2014 Study Year

During November 14–18, 2014, one researcher and one student intern with the Division of Subsistence conducted field research in Perryville (Table 1-6). Training for two LRAs was conducted on November 14. The researcher and student intern each worked with an LRA to contact households and conduct the household surveys and 89% of all households were surveyed (Table 1-4). Out of a total of 39 households, 34 were surveyed, four were unable to be contacted, and one declined to be surveyed.

2015 Study Year

During January 29–31, 2016, one researcher and one student intern with the Division of Subsistence conducted field research in Perryville (Table 1-6). Training for two LRAs was conducted on January 29. The researcher and student intern each worked with an LRA to contact households and conduct the household surveys and 85% of all households were surveyed (Table 1-4). Out of a total of 39 households, 33 were surveyed, four were unable to be contacted, and two declined to participate.

2016 Study Year

During February 6–11, 2017, two researchers from ADF&G Division of Subsistence, one researcher and one student intern from OSU, and one researcher from BBNA conducted fieldwork in Perryville (Table 1-6). This was the first community where the survey was conducted by staff who were combined from two different projects to consolidate fieldwork efforts. As such, staff met on February 6 to review the survey form and to ensure everyone was clear about how to ask questions on the survey form and how to properly record the data. Training with three LRAs was conducted on February 7, and surveys were conducted from February 8–11, 2017. Four researchers and the student intern each worked with an LRA to contact households and conduct the household surveys. During the six days of fieldwork, 70% of all households were surveyed (26 of 37 households) and four were unable to be contacted (Table 1-4). There were seven households that declined to participate, which was the highest refusal rate (21%) experienced in any community for any of the three study years.

Data Analysis and Review

Survey Data Entry and Analysis

Surveys were coded for data entry by research staff in the field before leaving the community in which surveys were administered for consistency. Responses were coded following standardized conventions used by the Division of Subsistence to facilitate data entry. Division of Subsistence Information Management staff set up database structures within the Microsoft SQL Server at the ADF&G office in Anchorage to hold the survey data. The database structures included rules, constraints, and referential integrity to ensure that data were entered completely and accurately. Data entry screens were available on a secured internal network. Daily incremental backups of the database occurred, and transaction logs were backed up hourly. Full backups of the database occurred twice weekly. This process ensured that no more than one hour of data entry would be lost in the unlikely event of a catastrophic failure. All survey data were entered twice, and each set compared to one another, in order to minimize data entry errors.

Once data were entered and confirmed, information was processed with the use of Statistical Package for the Social Sciences (SPSS) software, version 21. Initial processing included the performance of standardized logic checks of the data. Logic checks are often needed in complex data sets where rules, constraints, and referential integrity do not capture all of the possible inconsistencies that may appear. Harvest data collected as numbers of fish were converted to pounds usable weight using standard factors (see Appendix C for conversion factors).

Division of Subsistence staff also used SPSS for analyzing the survey information. Analyses included review of raw data frequencies, cross tabulations, table generation, estimation of population parameters, and calculation of confidence intervals for the estimates. Missing information was dealt with on a case-by-case basis according to standardized practices, such as minimal value substitution or using an averaged response for similarly characterized households. Typically, missing data are an uncommon, randomly-occurring phenomenon in household surveys conducted by the division. In unusual cases where a substantial amount of survey information was missing, the household survey was treated as a “non-response” and not included in community estimates. Division researchers documented all adjustments.

Harvest estimates and responses to all questions were calculated based upon the application of weighted means (Cochran 1977). These calculations are standard methods for extrapolating sampled data. As an example, the formula for harvest expansion is:

$$H_i = \bar{h}_i S_i \quad (1)$$

$$\bar{h}_i = \frac{h_i}{n_i} \quad (2)$$

where:

H_i = the total estimated harvest (numbers of resource or pounds) for the community i ,

\bar{h}_i = the mean harvest of returned surveys,

h_i = the total harvest reported in returned surveys,

n_i = the number of returned surveys, and

S_i = the number of households in a community.

As an interim step, the standard deviation (SD) (or variance [V], which is the SD squared) was also calculated with the raw, unexpanded data. The standard error (SE), or SD of the mean, was also calculated for each community. This was used to estimate the relative precision of the mean, or the likelihood that an unknown value would fall within a certain distance from the mean. In this study, the relative precision of the mean is shown in the tables as a confidence limit (CL), expressed as a percentage. Once SE was calculated, the CL was determined by multiplying the SE by a constant that reflected the level of significance desired, based on a normal distribution. The value of the constant is derived from the student's t distribution, and varies slightly depending upon the size of the community. Though there are numerous ways to express the formula below, it contains the components of a SD, V, and SE:

$$C.L.\%(\pm) = \frac{t_{\alpha/2} \times \frac{s}{\sqrt{n}} \times \sqrt{\frac{N-n}{N-1}}}{\bar{x}} \quad (3)$$

where:

S = sample standard deviation,

n = sampled households,

N = total number of households in the community,

$t_{\alpha/2}$ = student's t statistic for alpha level ($\alpha=0.95$) with $n-1$ degrees of freedom, and

\bar{x} = sample mean.

Small CL percentages indicate that an estimate is likely to be very close to the actual mean of the sample. Larger percentages mean that estimates could be further from the mean of the sample.

The corrected final data from the household survey was added to the Division of Subsistence CSIS. The CSIS is a publicly accessible database maintained by the Division of Subsistence and includes community-level study findings.

Population Estimates and Other Demographic Information

As noted above, a goal of the research was to collect demographic information for all year-round households in each study community in each study year. For this study, “year-round” was defined as being domiciled in the community when the surveys took place and for three months or more as their principal residence during the study year. These residency criteria stayed the same for each of the three study years. Because not all households were interviewed, population estimates for each community were calculated by multiplying the average household size of interviewed households by the total number of year-round households, as identified by Division of Subsistence researchers in consultation with community officials and other knowledgeable respondents.

According to the 2010 federal census, the population of the study communities ranged from 73 to 113 residents (U.S. Census Bureau n.d.). The five-year (2012–2016) American Community Survey (ACS)

estimated average population encompasses all the study years for which research was conducted in every study community (U.S. Census Bureau n.d.). Based on the ACS average estimates, Chignik Bay had the lowest average population of the study communities of 40 (70% Alaska Native); Chignik Lagoon was similar with a population of 59 (76% Alaska Native). Chignik Lake had an average population of 71, and the average for Perryville was 94. Chignik Lake and Perryville had 94% and 98% Alaska Native populations, respectively. Population estimates based on the survey results by the Division of Subsistence will be discussed in more detail in Chapter 3.

There may be several reasons for differences among the population estimates for each community generated from the division's surveys and other demographic data developed by the 2010 federal census, the U.S. Census Bureau's ACS, and the Alaska Department of Labor and Workforce Development (ADLWD 2019; U.S. Census Bureau n.d.). Sampling strategy, timing of survey administration, and eligibility criteria for inclusion in the sample may each explain differences in the population estimates.

Map Data Entry and Analysis

As discussed above, maps were generated based on data collected using an iPad or on 11x17-inch paper maps and transferred to an iPad. Map features were matched to the survey form to ensure that all harvest data that were successfully uploaded using WiFi were recorded accurately. Using all data uploaded to the ESRI cloud server, ADF&G Information Management staff created salmon search and harvest location maps in ArcGIS using a standard template for reports. Although each household survey included a mapping component, not every household shared fishing and harvest locations with researchers. Note that the legend for each map contains a specific sample size for spatial data collection in relation to the total sample achieved in the community. Each map is a partial representation of areas used for salmon fishing and harvesting in each study year due to sampling as well as the issues previously described regarding spatial data losses. Maps depict salmon search and harvest areas at the community level. To ensure confidentiality, the maps produced for the report do not distinguish between overall search areas and specific harvest locations. Maps for all three study years were reviewed during community review meetings conducted in October 2018 to ensure accuracy as well to provide community attendees the opportunity to identify any data the community would like kept confidential; note that at each community review meeting, there were no concerns or issues with maps.

Key Respondent Interview Analysis

Most of the interviews that were audio recorded were transcribed verbatim (see Table 1-3 for list of interview transcribers). Detailed interview notes were taken when an interview was conducted regardless of whether it was audio recorded to capture information provided by a respondent, including writing quotes. All collected qualitative data, including transcriptions, researcher notes from non-structured KRIs, respondents' comments written on household surveys, and other relevant field notes written by researchers were coded to identify all prominent themes linked to Chinook salmon. Themes that emerged included methods of harvesting and processing Chinook salmon; observed changes to the Chinook salmon run and condition of fish; observed environmental changes in freshwater and saltwater habitats; practices for recording Chinook salmon removed as home pack; management of the Chinook salmon stock; and perceived effects of the commercial, sport, and subsistence fisheries, as well as other human factors, on Chinook salmon.

Commercial Fish Ticket and Subsistence Salmon Permit Data Analysis

The Division of Commercial Fisheries fulfilled an *OceanAK* database query request submitted by the Division of Subsistence for the reported number of retained commercially caught salmon by study community commercial fishermen. These data were obtained for comparison purposes against household survey results regarding use of commercially retained salmon for home use and the number of retained fish.

Additionally, subsistence salmon permit data were provided by the Division of Commercial Fisheries prior to postseason household surveys being conducted by the Division of Subsistence. Harvest amounts reported on subsistence permits were analyzed and initial harvest estimates were generated for comparison purposes. Following the completion of the annual postseason household surveys for each study year, permit and

survey data were carefully compared, integrated, and expanded into final estimated subsistence harvests for each year, as described in an earlier section of this chapter.

Community Data Review Meetings

In accordance with the ethical principles of research identified earlier, the Division of Subsistence arranged for community reviews of draft study findings of household surveys. These meetings allowed community members the opportunity to review the data collected and comment on whether data appeared accurate or not. Also, staff could answer questions from community members about the project or findings, as well as learn from attendees whether there were reservations about publishing any data findings, such as not including a harvest location that members do not want commercial harvesters to learn about that could lead to depleted resource availability. However, as previously noted, there were no concerns or issues with maps. Additionally, any comments from the public gathered during data review meetings that were relevant to Chinook salmon were recorded by staff in field notes and analyzed with the other qualitative data collected.

As mentioned previously, community project data review presentations showing preliminary findings for the 2014 and 2015 study years occurred concurrently with presentations that provided overviews about the sharing network project and third year of fieldwork for the CSRI project. Table 1-2 lists dates that those meetings occurred, which took place in either a building owned by a community's village council or in a community center, and also cites attendance information for community residents and project staff. A Microsoft PowerPoint presentation about early study results from 2014 and 2015 displayed data regarding sample achievement; estimated salmon harvest amounts based on household surveys or returned subsistence permits; harvest composition; assessments about changes to salmon use; and assessments about salmon stock health, behavior, and escapement. There were few questions asked about the data by those community members who attended the meetings. As indicated previously, map data of search harvest locations in 2014 and 2015 were not presented at these meetings. CSRI project PI Hutchinson-Scarborough reminded the communities that a third year of data collection would occur simultaneously with the data collection effort for the sharing network project.

Preliminary research findings for the 2016 study year were presented at data review meetings in October 2018 in each CSRI project study community at a village council's office building or community center (Table 1-7). The meetings were arranged in advance with each community's tribal council by Cody Larson from BBNA, a project partner for the sharing network study, because the household surveys for 2016 collected data for both projects. Larson provided each community with flyers that were posted to announce the date, location, and subject of each data review meeting. A Microsoft PowerPoint presentation highlighted the preliminary survey results and associated fishing and harvest maps for the shared projects and also earlier study years of the CSRI project, as well as sharing network diagrams for the project funded by OSM. CSRI project PI Hutchinson-Scarborough presented the preliminary household survey findings and associated spatial results that applied to both projects in Chignik Bay, Chignik Lagoon, and Perryville; Larson from BBNA presented the same preliminary data at the meeting in Chignik Lake and assisted Hutchinson-Scarborough at meetings in Chignik Bay and Chignik Lagoon. Sharing network data were presented by Andrew Gerkey or Shane Scaggs, the researcher and student intern from OSU, the other sharing network project partner. All four project representatives who attended the first data review meeting intended to travel and present the data findings to all the communities together, but after the data review meeting in Chignik Bay, bad weather caused flight cancellations that grounded the team in Chignik Bay and delayed the schedule for proceeding to the remaining communities. When travel was again possible, the team split up: one person each from ADF&G and OSU went to Perryville, and one each from BBNA and OSU went to Chignik Lake. The data review meeting held for Chignik Lagoon and a second meeting held at Chignik Lake occurred on the same date: one representative from each of the three partners conducting the sharing network project went to Chignik Lagoon, and research staff from OSU and BBNA returned to Chignik

Table 1-7.—Staff and community member attendance, 2016 preliminary study results information meetings.

Community	Date	Attendance		
		Community residents	Staff	Staff affiliation
Chignik Bay	10/23/2018	12	Andrew Gerkey	OSU staff
			Lisa Hutchinson-Scarborough	ADF&G staff
			Cody Larson	BBNA staff
			Shane Scaggs	OSU student intern
Chignik Lagoon	10/29/2018	6	Lisa Hutchinson-Scarborough	ADF&G staff
			Cody Larson	BBNA staff
			Shane Scaggs	OSU student intern
Chignik Lake	10/27/2018	3	Andrew Gerkey	OSU staff
	and 10/29/ 2018	and 12	Cody Larson	BBNA staff
Perryville	10/27/2018	12	Lisa Hutchinson-Scarborough	ADF&G staff
			Shane Scaggs	OSU student intern

Lake. Community members did not provide any notations indicating errors in the harvest and assessments data or maps presented for this project.

Other Project Overviews

Hutchinson-Scarborough and Marchioni attended the December 2015 ADF&G CSRI Principal Investigators Symposium in Anchorage and presented a Microsoft PowerPoint presentation with preliminary results of the 2014 project research. In addition, the PIs presented a project overview presentation at the Chignik Regional Aquaculture Association's board meeting in Anchorage in February 2015, and a brief project overview was published by ADF&G in the newsletter *Chinook News*; see "Chignik River" by Russel and Marchioni in *Chinook News*, Winter 2015, Issue 2, p. 2–3 (http://www.adfg.alaska.gov/static/home/library/pdfs/chinooknews/cn_winter2015_n2.pdf).

FINAL REPORT ORGANIZATION

The findings from quantitative data collected for this study using household surveys are organized first by survey topic and then generally by study community and study year, and qualitative results are grouped into a separate chapter. But, before either survey or interview results are presented, Chapter 2 provides a broad overview of the regulatory structure for salmon fisheries in the CMA, which contributes to shaping salmon use and harvest patterns in the study communities. Chapter 3 begins with a short background section for each study community to describe historical key settlement changes. What follows in Chapter 3 are tables and figures, and accompanying narrative, on demographic characteristics, household characteristics for salmon uses (including sharing) and harvests (including taking home pack and fishing gear types used), fishing and harvest locations, and self-assessments regarding changes to salmon use and having enough salmon. Chapter 4 summarizes comparisons of survey results to permit data to shed light on participation in reporting home pack and subsistence salmon harvests. Qualitative data are presented separately in Chapter 5, which provides a summary of findings based on direct statements from the key respondents during interviews; these data are complemented by responses to stock assessment questions that were in the surveys, and also other field notes. The report concludes with a discussion of findings, recommendations for resource managers, and suggestions for further research. After the report was finalized, ADF&G provided a copy of the report to the tribal council of each study community.

2. SUBSISTENCE SALMON REGULATION OVERVIEW OF THE CHIGNIK MANAGEMENT AREA

BACKGROUND

In Alaska, subsistence fishing is regulated through a dual management system between the State of Alaska and the federal government, depending which entity manages a given area. The federal government regulates federal subsistence fisheries on federal public lands and federally reserved waters in Alaska, and the Alaska Administrative Code (Title 5: Fish and Game) contains descriptions of fisheries and waters that are regulated by the State of Alaska under authority of Alaska statutes. The Federal Subsistence Board (FSB) creates and modifies regulations for federal subsistence fisheries and federal law allows subsistence harvests only by residents of rural areas as defined by the FSB. The Alaska Board of Fisheries (BOF) has the authority to create and modify regulations for state-managed fisheries. Under state law, all Alaska residents may participate in state-managed subsistence fisheries regardless of where they reside. State and federal jurisdictions overlap in many areas of the state. The Chignik Management Area (CMA) contains both state-managed and federally-managed fisheries. The overview below includes key state regulatory developments regarding subsistence fishing, followed by summaries of the state and federal subsistence fishing regulations in effect during this project's study years of 2014–2016 for the CMA.

CHIGNIK MANAGEMENT AREA BOUNDARY

The CMA, as defined for the state-managed fisheries, includes all waters of Alaska on the south side of the Alaska Peninsula bounded by a line extending 135° southeast to a point at the southern entrance to Imuya Bay near Kilokak Rocks at lat 57° 10.34' N, long 156° 20.22' W, then due south, and a line extending 135° southeast from the tip of Kupreanof Point at lat 55° 33.98' N, long 159° 35.88' W (5 AAC 01.450) (Figure 1-1).

PROVIDING FOR SUBSISTENCE SALMON USES IN THE CMA

Managing Findings for Amounts Reasonably Necessary for Subsistence (ANS)

Subsistence uses of wild resources are defined by the State of Alaska as “noncommercial, customary and traditional uses” for a variety of purposes. Purposes 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 byproducts of fish and wildlife resources harvested for personal or family consumption, and for the customary trade, barter, or sharing for personal or family consumption (AS 16.05.940(34)).

Under Alaska's subsistence statute (AS 16.05.258), the BOF must identify fish stocks that are customarily and traditionally taken or used for subsistence (known as a positive C&T finding), and, if there is a harvestable surplus of these stocks, adopt regulations that provide reasonable opportunities for subsistence uses of these stocks to take place. Whenever it is necessary to restrict harvests due to low stock runs, subsistence uses have a preference over other uses of the stock.

Once the BOF has made a positive C&T finding, their next step is to determine the amount of the harvestable surplus that is reasonably necessary for subsistence (an ANS finding). ANS findings are one tool the BOF has for evaluating subsistence regulations to determine if reasonable opportunities are being provided for subsistence (customary and traditional) uses. “Reasonable opportunity” is defined as “an opportunity, as determined by the appropriate board, that allows a subsistence user to participate in a subsistence hunt or fishery that provides a normally diligent participant with a reasonable expectation of success of taking of fish or game” (AS 16.05.258(f)). The BOF can reexamine subsistence regulations if subsistence harvests consistently fall below the ANS. This may indicate that regulations are not providing a reasonable opportunity, or that characteristics of the stock or population have changed, or that the ANS needs adjusting due to changing use patterns. These findings can also be revised when a management issue arises and more precision is needed.



2016 CHIGNIK AREA SUBSISTENCE SALMON FISHING PERMIT

Permit expires December 31, 2016

PERMIT # _____

This permit is valid in the Chignik Management Area Only.

Name: _____
Address: _____

I hereby certify that I am an Alaska resident, and any fish taken will be used for subsistence purposes only.

Permittee signature _____ Date _____

Email address: _____ Renew permit for next year: ☐

The catch report table below must be filled out (even if the permit was not used) and returned to a local Alaska Department of Fish and Game office prior to December 31, 2016. Failure to return the permit could result in future permits being denied (5 AAC 01.015 (C)).

SUBSISTENCE SALMON HARVEST REPORT

Number of salmon by species:

DATE	SPECIFIC LOCATION	KING	SOCKEYE	COHO	PINK	CHUM

- ALL PERSONS MUST HAVE A VALID SUBSISTENCE PERMIT IN POSSESSION WHILE TAKING OR ATTEMPTING TO TAKE SUBSISTENCE SALMON.
- COMPLETE THE SUBSISTENCE HARVEST REPORTS IMMEDIATELY UPON LANDING SALMON. UNSUCCESSFUL TRIPS SHOULD ALSO BE RECORDED.
- THE LIMIT IS 250 SALMON PER PERMIT. ADDITIONAL PERMITS MAY BE ISSUED IF ADDITIONAL SALMON ARE NEED FOR SUBSISTENCE.

REFER TO THE CURRENT SUBSISTENCE REGULATION BOOK FOR COMPLETE REGULATIONS

Return permit to: Chignik Salmon Management, ADF&G, 351 Research Court, Kodiak, AK 99615 by December 31, 2016.

Department representative _____ Date _____

(SEE OPPOSITE SIDE FOR SUBSISTENCE REGULATIONS)

SELECTED SUBSISTENCE REGULATIONS

These listed regulations are not inclusive of all the regulations that apply to subsistence salmon fishing in the Chignik Area.

Figure 2-1.—Sample Chignik Management Area subsistence salmon permit, 2016.

Figure 2-1.—Page 2 of 2.

5 AAC 01.015. SUBSISTENCE FISHING PERMITS AND REPORTS. (b)(3) Permits must be retained in the possession of the permittee and be readily available for inspection while taking fish. A person who transports subsistence-taken fish shall have a subsistence fishing permit in their possession.

5 AAC 01.460. FISHING SEASONS. Fish, other than rainbow trout and steelhead trout, may be taken at any time, except as may be specified by a subsistence fishing permit. Rainbow trout and steelhead trout, taken incidental in other subsistence finfish net fisheries, are lawfully taken and may be retained for subsistence purposes.

5 AAC 01.470. LAWFUL GEAR AND GEAR SPECIFICATIONS. (a) Salmon may be taken by seines and gillnets, or with gear specified by a subsistence fishing permit, except that salmon in Chignik Lake may not be taken with purse seines. A gillnet may not be set while staked, anchored, or otherwise fixed in a stream while it obstructs more than one-half of the width of the waterway.

5 AAC 01.475. WATERS CLOSED TO SUBSISTENCE FISHING. Salmon may not be taken (1) from July 1 through August 31, in the Chignik River from a point 300 feet upstream from the Chignik weir to Chignik Lake; (2) in Black Lake or any tributary to Black Lake or tributary to Chignik Lake except in the Clark River and Home Creek from their confluence with Chignik Lake upstream one mile.

AAC 01.480. SUBSISTENCE FISHING PERMITS.

- a. Salmon, trout and char may only be taken under the authority of a subsistence fishing permit.
- b. Not more than 250 salmon may be taken for subsistence purposes unless otherwise specified on the subsistence fishing permit.
- c. A record of subsistence-caught fish must be kept on this permit. The record must be completed immediately upon taking subsistence-caught fish and must be returned to the local representative of the department no later than December 31 of the year issued.

5 AAC 01.485. RESTRICTIONS ON COMMERCIAL FISHERMAN. (a) In the Chignik Area, a commercial salmon fishing license holder may not subsistence fish for salmon during the 12 hours before the first commercial salmon fishing period and the 12 hours following the closure of a commercial salmon fishing period. However, a commercial salmon fishing license holder may subsistence fish for salmon during a commercial salmon fishing period.

SPECIAL PERMIT PROVISIONS

1. The adipose fin must be removed from all subsistence-caught salmon immediately upon capture.
2. A commercial license holder may not fish for both subsistence and commercial salmon at the same time. Further, a commercial salmon vessel may not carry both the subsistence and commercially caught salmon at the same time.
3. A commercial fishing vessel may not simultaneously carry both commercial seine and subsistence gillnet gear.
4. Commercial fisherman may always remove salmon from their commercial catch for home pack. Record the number of salmon taken by species for home pack use on your fish ticket.
5. This permit can be withdrawn at any time.

NOTICE TO FISHERMAN:

Before you fish, be sure you know whose land you are on and check the regulations. State regulations apply on all state, private, and federal lands where authorized. Private landowners may restrict entry on their land. Federal lands may be closed to fishing except by certain rural residents. Persons standing on state or private lands should be sure their fishing activities are legal under state regulations. If you have questions regarding the federal subsistence fisheries, please contact the Federal Office of Subsistence Management at 1-800 478-1456.

Return permit by December 31, 2016 to: Alaska Department of Fish and Game, Chignik Salmon Management, 351 Research Court, Kodiak, AK. 99615. Questions or concerns please contact your local Fish and Game Office: Chignik (907) 845-2243 (May 15 to September 15) or Kodiak (907) 486-1830.

Phrasing the intent of ANS findings as providing for “subsistence needs” can be misinterpreted. The ANS is not intended to be a minimum number linked to harvests by a subset of users with low incomes to meet a bare level of survival, nor does it reflect how many salmon, for example, are needed by subsistence users (this can vary from year to year). ANS findings are allocations of the harvestable surplus to subsistence uses, but subsistence fisheries generally do not close when the subsistence harvest reaches the upper range of the ANS.

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 established 19,000 salmon as the amount reasonably necessary to provide for subsistence uses (an ANS finding); this number was based on areawide estimates of total salmon harvests by all local communities derived from systematic household surveys for 1984 and 1989, and for Chignik Bay and Chignik Lake in 1991, and also subsistence permit returns (Hutchinson-Scarborough and Fall 1996:1, 4–5, 11). In 2002, the BOF modified the initial ANS finding to accommodate more precise findings for particular stocks after recognizing that different fishing patterns for salmon exist in the CMA, and thus different metrics were needed in order to assess if reasonable opportunity was being given to harvest these specific salmon for subsistence uses (Hutchinson-Scarborough et al. 2010:2). The revised ANS factored harvests for early-run (until September 15) and late-run (September 15 or later) sockeye salmon separately, and established separate ANS findings for the other salmon species in the CMA. The ANS revised by the BOF in 2002 stood until 2019.¹ As such, during the study years, for the Chignik Bay, Central, and Eastern districts combined, the ANS was 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 (Bouwens and Poetter 2006:16). Also, in the Perryville and Western districts combined, the ANS was 1,400–2,600 coho salmon and 1,400–2,600 salmon other than coho salmon.

Although applicable to managing the subsistence fishery after the study period, it is important to note that the ANS was revised in 2019 using subsistence harvest data from the study years in the BOF deliberation process to make that change. At the February 21–26, 2019, Alaska Peninsula/Chignik/Bering Sea-Aleutian Islands Finfish BOF meeting, the ANS for early- and late-run sockeye salmon in the Chignik Bay, Central, and Eastern districts combined (including the Chignik River watershed) was updated to reflect the current understanding of run timing of the sockeye salmon early and late runs as determined based on in-season genetic sampling. According to submitted meeting documents, 50% of early-run and 50% of late-run sockeye salmon escapement occurs in early- to mid-July, which is the timing that fisheries managers use for managing escapement objectives for each sockeye salmon run. The BOF amended the ANS in 2019 for early- and late-run sockeye salmon for the Chignik Bay, Central, and Eastern districts combined (including the Chignik River watershed) based on subsistence harvest estimates from permit returns and subsistence household surveys spanning 2001 through 2018 but excluding estimates from nearly 10 years in which harvests did not achieve the lower bound of the ANS.² The changed ANS now stands at 2,900–5,400 early-run sockeye salmon (sockeye salmon harvested from May–July 4) and 3,200–6,000 late-run sockeye salmon (harvested on or after July 5). The ANS findings established in 2002 for the other species of salmon for all CMA locations were not amended, nor were they amended for sockeye salmon in the Perryville and Western districts (combined); all current ANS findings are published in 5 AAC 01.466.

1. Alaska Department of Fish and Game. 2019. “Alaska Board of Fisheries Meeting Information: Alaska Peninsula/Chignik/Bering Sea-Aleutian Islands Finfish: February 21–26, 2019, Record Copy (RC) 101,” http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2018-2019/akpen/rcs/rc101_ADF&G_Subsistence_ANS_Options_Chignik_Area_Sockeye_Data.pdf (accessed May 2020).
2. Alaska Department of Fish and Game. 2019. “Alaska Board of Fisheries Meeting Information: Alaska Peninsula/Chignik/Bering Sea-Aleutian Islands Finfish: February 21–26, 2019, Record Copies (RCs) — Other meeting documents & documents submitted at the meeting (RC 101),” <https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=02-21-2019&meeting=anchorage> (accessed May 2020).

Managing Escapement Goals to Provide for Subsistence

At the November 2004 meeting, 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) in order to enhance late-season subsistence opportunities in Chignik Lake (Bouwens 2005:6; Stichert 2007a:15). At a meeting in December 2013, the BOF adopted a board-generated proposal to codify a management measure first established through board intent language adopted in 2004 that sought to ensure inriver harvest opportunities upriver from the Chignik River weir to provide for late-run subsistence harvests. Following passage of that proposal, ADF&G managed for the escapement of 50,000 sockeye salmon, composed of 25,000 fish in August and 25,000 fish from September 1–15, in addition to late-run escapement needs.³

The BOF, at the February 2016 meeting addressing finfish regulations in the Alaska Peninsula, Aleutian Islands, and Chignik management areas, adopted a proposal to amend 5 AAC 15.357(b)(3)(B) to read “the department shall manage the commercial fishery to allow for the passage of at least 75,000 sockeye salmon above the Chignik River weir, in addition to late-run sockeye salmon escapement needs, to provide an inriver harvestable surplus above the Chignik River weir in August and September of at least 25,000 fish in August and 50,000 fish from September 1 through September 30.”⁴ The increase to the inriver run goal from 50,000 fish to 75,000 fish in August and September is to provide for late-season subsistence needs (Wilburn and Stumpf 2017:10).

At the February 21–26, 2019, Alaska Peninsula/Chignik/Bering Sea-Aleutian Islands Finfish BOF meeting, Proposal 147 was accepted⁵ to amend the Chignik Area Salmon Management Plan to reduce the inriver harvestable surplus goal for sockeye salmon established by the BOF in 2016. The inriver harvestable surplus goal was changed from 25,000 fish in August and 50,000 fish in September to 20,000 fish total: 10,000 salmon in August and 10,000 salmon in September (5AAC 15.357 (b)(3)(B)).

EARLY STATE REGULATIONS

State regulations for subsistence salmon fishing are often tied to commercial fishing operations in the CMA. ADF&G Division of Commercial Fisheries manages salmon commercial fisheries and subsistence fisheries in the Westward Region⁶ where the Chignik Management Area (Area L) is located. For example, commercial salmon license holders and crew members have been and are subject to subsistence fishing participation restrictions. Following is an overview of key changes to first subsistence and then commercial fishing regulations, and then an overview of the subsistence fishing opportunities that applied to commercial fishery participants as those various key changes were applied to subsistence and commercial fisheries regulations.

Beginning in 1980, subsistence fishers harvesting salmon in the CMA were required to obtain a permit (Fall et al. 2019:122). Early subsistence regulations from prior to 1985 allowed fishing with seine and gillnet gear in all waters open to subsistence fishing and allowed a seasonal limit of 250 salmon per subsistence permit

3. Alaska Department of Fish and Game. 2013. “Alaska Board of Fisheries Meeting Information: Chignik Finfish – December 5–6, 2013, Meeting Summary (Meeting Summary),” <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=12-05-2013&meeting=chignik> (accessed June 2020).
4. Alaska Department of Fish and Game. 2016. “Alaska Board of Fisheries Meeting Information: Alaska Peninsula/Aleutian Island/Chignik Finfish – February 23–29, 2016, Meeting Summary (Draft Meeting Summary) and Record Copy (RC) — Submitted during the meeting (RC105),” <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=02-23-2016&meeting=anchorage> (accessed June 2020).
5. Alaska Department of Fish and Game. 2019. “Alaska Board of Fisheries Meeting Information: Alaska Peninsula/Chignik/Bering-Aleutian Islands Finfish – February 21–26, 2019, Meeting Summary, Meeting Proposals (Proposal 147), and Record Copies (RCs) — Other meeting documents & documents submitted at the meeting (RC 101),” <https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=02-21-2019&meeting=anchorage> (accessed June 2020).
6. Alaska Department of Fish and Game, “Westward [Region],” <http://www.adfg.alaska.gov/index.cfm?adfg=fishingCommercialByArea.southwest> (accessed November 2019).

(Morris 1987:183–186). Closed waters to subsistence fishing were established in the CMA, and a series of changes to the closed waters have occurred to protect spawning fish. In 1984, no subsistence fishing was allowed upstream from the ADF&G weir site or counting tower in the Chignik River, in Chignik Lake, Black Lake, or any tributary to these lakes; but, regulations were changed in 1985 to provide for subsistence fishing in Chignik Lake by gillnets or hand seines (Morris 1987:185). Note that purse seines could be used in all waters open to subsistence fishing except in Chignik Lake (Fall et al. 2001:69; Morris 1987:183–186). 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 (Bouwens 2004:14). Effective in 2005, the BOF in November 2004 opened the Chignik River 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 2007a:15). During its January 2008 meeting, the BOF adopted regulatory changes to subsistence fishing in the CMA that allowed subsistence salmon fishing in the Chignik Lake tributaries of 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 was restricted so that when gillnets are fixed, anchored, or otherwise held in place, the gear may not obstruct more than one-half of the stream that is open to subsistence salmon fishing (Stichert 2008:4). The Chignik Lake Village Council submitted a regulatory proposal to the BOF at the meeting in January 2011 regarding CMA subsistence fishing gear and closed waters.⁷ Proposal 96 stated that regulations unnecessarily disallowed traditional and sustainable subsistence practices in closed waters. 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 and spear in specific areas (including in some of the waters being requested for opening to subsistence fishing). The Division of Subsistence provided written and oral reports to the BOF for the meeting that included background information and relevant subsistence research data that supported the proposal (Hutchinson-Scarborough et al. 2010). The BOF took no action on the proposal.⁸ The FSB met a few days after the BOF meeting and took up a similar proposal, FP11-10, which the FSB voted to adopt into federal regulations for qualified residents of the CMA (U.S. Fish and Wildlife Service 2011:169). Information about the federal subsistence fishery in the CMA is provided later in this chapter.

Prior to 2002, the CMA commercial fishery was managed by ADF&G as a competitive, limited entry permit fishery.⁹ From 2002 to 2005, the CMA commercial salmon fishery was managed based on two management plans: the Chignik Area Salmon Management Plan (competitive fishery) and the Chignik Area Cooperative Purse Seine Salmon Fishery Management Plan (cooperative fishery) (Stichert 2007a). The cooperative fishery plan was determined to be illegal by the Alaska Supreme Court in March 2005, but in May 2005 the BOF reestablished a modified cooperative management plan by emergency regulation in response to the court’s decision (Stichert 2007b:3). The court recognized that the timing of its decision did not allow cooperative members to revert to independent, competitive fishing to participate in the 2005 season and allowed the fishery to operate under the modified regulation while the court deliberated over the issue. However, in early 2006, the court issued an opinion on the original decision that the cooperative fishery was illegal unless the Alaska State Legislature amended the Limited Entry Act to allow it (Knapp 2007:38–42). Since 2006, the CMA commercial fishery has been managed solely under the Chignik Area Salmon Management Plan (see 5 AAC 15.357) as a competitive fishery in accordance with the Limited Entry Act and managed by the Commercial Fisheries Entry Commission (CFEC).

7. Alaska Department of Fish and Game. 2011. “Alaska Board of Fisheries Meeting Information: Chignik Finfish – January 16–19, 2011, Meeting Documents (Proposals),” <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=01-16-2011&meeting=anchorage> (accessed June 2020).

8. Alaska Department of Fish and Game. 2011. “Alaska Board of Fisheries Meeting Information: Chignik Finfish – January 16–19, 2011, Meeting Documents (Actions Taken),” <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=01-16-2011&meeting=anchorage> (accessed June 2020).

9. In 1973, the Alaska Legislature passed the Limited Entry Act, which formed competitive salmon fisheries in Alaska.

As mentioned previously, commercial salmon fishery participants who also want to subsistence fish have been subject to restrictions on subsistence salmon fishing opportunities (for current stipulations, see 5 AAC 01.485—Restrictions on Commercial Fishermen). For example, effective in 1993, the BOF changed subsistence salmon fishing restrictions for commercial salmon license holders to allow spring subsistence salmon fishing in May and June up until 48 hours before the first commercial salmon fishing opening and then commercial salmon fishery participants could not subsistence fish until after September 30 (Hutchinson-Scarborough and Fall 1996:11). Previously, commercial salmon fishermen could not subsistence fish between June 10 and September 30, although they were allowed to remove salmon from a commercial catch for home use, and continued to be able to do so after the change in 1993, as long as the number of salmon taken but not sold was reported on an ADF&G fish ticket at the time of landing (see 5 AAC 15.355(b)) (Fall et al. 2001:69; Hutchinson-Scarborough and Fall 1996:11). After development of the cooperative fishery in 2002, ADF&G management staff added special provisions to the 2003 and 2004 subsistence salmon permits that increased subsistence harvest opportunities for commercial fishing license holders (Bouwens 2004:100–101; Bouwens et al. 2006:12, 92–93; Fall et al. 2009:83). In addition to obtaining a subsistence permit, commercial harvesters wishing to subsistence fish after the first commercial opening were allowed to do so after registering to subsistence fish with ADF&G staff working at the weir and in accordance with special provisions published on the subsistence permit (Bouwens 2004:100–101; Bouwens et al. 2006:92–93). Subsistence permit conditions provided subsistence fishing opportunities for cooperative commercial license holders during competitive fishery openings and for competitive commercial license holders during cooperative fishery openings (see special permit provisions 5 and 6). Additionally, per subsistence permit special provision 7, cooperative commercial license holders who were not actively engaged in commercial fishing could subsistence fish during both cooperative and competitive commercial openings—with gillnet gear only—after registering with ADF&G to do so. At its 2004 meeting, the BOF adopted regulations (see Proposal 43¹⁰) that went into effect in 2005 to change 5 AAC 01.485 to increase subsistence fishing opportunities for commercial salmon fishing license holders. The updates reflected much of the special provisions that were on the subsistence permits in 2003 and 2004 (Bouwens 2004:100–101; Bouwens et al. 2006:92–93; Stichert 2007a:5); however, the cooperative fishery shortly thereafter no longer existed, as described earlier. Subsequently, 5 AAC 01.485 was changed and limited commercial salmon license holders so that they may not subsistence fish for salmon during the 12 hours before or the 12 hours following a commercial salmon fishing period; however, commercial salmon license holders may choose to subsistence fish instead of commercial fish for salmon during a commercial salmon fishing period.

STATE REGULATIONS IN STUDY YEARS 2014–2016

Following is an overview of the salmon fishing opportunities in the CMA during this study’s project period, including conditions that were adopted throughout the prior 20 years that were described above as well as statewide subsistence salmon fishing provisions.

State of Alaska regulations governing subsistence salmon fishing in the CMA require that, to fish, an individual must obtain an annual subsistence salmon permit (see Figure 2-1 for an example of the permit from study year 2016) and must be an Alaska resident (5 AAC 01.480(a) and 5 AAC 01.010(b)). Annually, permits are available locally at the Chignik ADF&G weir facility and from local CMA community vendors, or from the ADF&G Kodiak office. There is an annual limit of 250 salmon per permit (5 AAC 01.480(b)), although ADF&G will issue an additional permit if more fish are needed for subsistence according to a provision stated on the CMA subsistence permit (Figure 2-1). Annually, the permit holder must record daily subsistence salmon harvests directly on the permit and return it to ADF&G by December 31 of that year (5 AAC 01.480(c)). Catch information obtained from subsistence permits is compiled annually and used to assess regional subsistence salmon fisheries, although permits do not require harvests to be reported by gear type.

10. Alaska Department of Fish and Game. 2004. “Alaska Board of Fisheries Meeting Information: Chignik Finfish – November 14–16, 2004, Meeting Documents (Proposals) and Meeting Summary (Meeting Summary),” <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=11-14-2004&meeting=anchorage> (accessed June 2020).

A subsistence salmon permit holder who does not hold a commercial salmon fishing license may subsistence fish for salmon at any time (Wilburn 2019:9). Commercial salmon license holders may subsistence fish for salmon during the commercial fishing season at any time except for 12 hours preceding and 12 hours following the end of a commercial salmon fishing period (5 AAC 01.485).¹¹ Commercial fishers may also retain fish from lawfully taken commercial catches for personal use, including use for bait, which is known as “home pack” (5 AAC 39.010(a)). Salmon retained for home pack are required to be reported on the commercial fish ticket at the time of landing (5 AAC 39.010(b)); commercially harvested fish retained for home use are not supposed to be recorded on subsistence permits. Home pack harvest estimates based on returned fish tickets are included by species in the ADF&G Division of Commercial Fisheries CMA annual finfish management report. Division of Subsistence household surveys collect data on salmon harvests using all gear types, including home pack amounts, and estimated harvests based on survey results from 2014–2016 will be presented later in this report.

Subsistence fishing may be closed by emergency order by the commissioner or an authorized designee of ADF&G based on local stock abundance and escapement objectives (AS 16.05.060). In 2014, 2015, and 2016 there were no subsistence fishery emergency orders or closures for the CMA.¹²

Under state regulations, as mentioned previously, all waters within the CMA are open year-round for subsistence fishing except for the following areas or conditions, or if closed by emergency order.

- Subsistence salmon fishing is permitted in the Chignik River; however, salmon may not be taken 300 feet upstream from the ADF&G weir to the outlet of Chignik Lake from July 1–August 31; this reach is closed to protect spawning Chinook salmon (5 AAC 01.475(1)).
- Subsistence fishing is closed within 300 feet (100 yards) upstream and downstream of the Chignik weir when it is operational (5 AAC 01.010(e)).
- 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)).
- Subsistence salmon may be caught using gillnets or seines; however, purse seine gear is not allowed for taking subsistence salmon in Chignik Lake (5 AAC 01.470(a)).
- 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 (5 AAC 01.470(a)).
- All subsistence salmon fishing gear must be marked with a buoy listing the first initial, last name, and address of the person operating the gear (5 AAC 01.010(h)).
- Subsistence fishermen must carry their subsistence permit with them while subsistence fishing (5 AAC 01.015(b)(3)).

There is no personal use fishery for salmon in the CMA. Sport fishing by Alaska residents and nonresidents who have a sport fishing license is allowed according to regulations in 5 AAC 65.001–5 AAC 65.051 for the Alaska Peninsula and Aleutian Islands Area and also statewide sport fishing provisions in 5 AAC 75.001–5 AAC 75.995. There are some sport fishing restrictions in both fresh and salt waters in the Alaska Peninsula and Aleutian Islands Area; a sport fishing regulations summary is posted on the ADF&G website¹³ annually.

11. Note that, as mentioned in the previous section of this chapter, 5 AAC 01.485 was amended in 2016, the last study year.

12. *Commercial Fishery Announcements (Includes Subsistence and Personal Use)*, s.v. “Management Area: Chignik; District: All Districts; Species: Salmon; Gear: All Gear Classes; Fishery Type: Subsistence; Effective Year: 2014, 2015, and 2016” (by Alaska Department of Fish and Game), <https://www.adfg.alaska.gov/index.cfm?adfg=cfnews.search> (accessed May 2020).

13. Alaska Department of Fish and Game. n.d. “Sport Fishing Regulations: Southwest Alaska.” http://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.sw_sportfish (accessed June 2020).

FEDERAL REGULATIONS IN STUDY YEARS 2014–2016

Federal subsistence fisheries are authorized in portions of the CMA for the permanent residents of the CMA communities. The federal government has, since 1990, regulated subsistence fishing for federal public lands and waters in Alaska to meet the requirements of the rural subsistence priority identified in Title VIII of the Alaska National Interest Lands Conservation Act. Federal management of subsistence fisheries on Alaska rivers and lakes and limited marine waters that are within and adjacent to federal public lands is under the purview of the secretaries of the U.S. departments of Agriculture and the Interior and regulations are published in both 36 CFR 242 and 50 CFR 100. 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 Subsistence Management Program n.d.).

Federal and state subsistence regulations in the CMA generally parallel each other; however, federal regulations authorize additional gear, harvest locations, harvest and possession limits, and harvest seasons in portions of the CMA not authorized by the state. Particularly with regard to allowable gear in specified locations, differences between federal and state regulations are more apparent. As one example, under federal regulations for qualified rural residents, salmon may be taken without a permit by snagging (by hand line or rod and reel), by using a spear or bow and arrow, or by capturing by bare hand (36 CFR 242.27(e)(8)(vi)); these gear allowances are in addition to other federal gear and location rules that match state regulations. Several FSB actions that occurred in recent years before the study period relate to some of the differences between state and federal subsistence regulations (U.S. Fish and Wildlife Service 2011:169; 2013:232–254).¹⁴

Starting in 2013, the federal program established a limited harvest assessment program that required obtaining a federal permit to harvest salmon in specific locations and seasons by specific methods on the federal lands and waters of the CMA.¹⁵ During the study years, few federal permits were issued to residents of the Chignik Area: 10 in 2014, two in 2015, and three in 2016 (Jon Gerken, Branch Chief–Fisheries, U.S. Fish and Wildlife Service, Anchorage, personal communication).

The following is a list of the 2014–2016 federal subsistence regulations for the harvest of salmon within the Chignik Area:

- Fishers must be a resident of one of the communities located within the Chignik Area.
- Salmon may be taken by seine, gillnet, rod and reel, or other gear specified on a subsistence fishing permit, except in Chignik Lake, where purse seines are not allowed. Salmon may also be taken without a permit by snagging (by hand line or rod and reel); by using a spear, bow and arrow; or by capturing by bare hand.
- Salmon may be taken without a permit in the open waters of Clark River and Home Creek by snagging (hand line or rod and reel); by spear, bow and arrow; or captured by hand. The daily harvest and possession limits using these methods are five per day and five in possession.
- Salmon may be taken by gillnet in the waters of Clark River and Home Creek from their confluence with Chignik Lake upstream one mile.
- Within the Chignik watershed, depending upon the area that is open to fishing, in addition to a state subsistence fishing permit, fishers may be required to also have a federal subsistence permit.

14. “Subsistence Management Regulations for Public Lands in Alaska—2011-12 and 2012-13 Subsistence Taking of Fish and Shellfish Regulations; Final Action,” 76 *Federal Register* 45 (March 8, 2011), pp. 12578–12579.

15. *Federal Register* 78, no. 61 (March 29, 2013): 19107–19125: <https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07198.pdf> (accessed November 2019).

- If a subsistence fisher holds a commercial fishing license, she or he may subsistence fish for salmon only as specified on a subsistence fishing permit.
- If a permit is required, a record of subsistence-caught fish must be kept on the permit. The record must be completed immediately upon taking subsistence-caught fish and must be returned no later than the due date listed on the permit. Under the authority of a federal subsistence fishing permit:
 - Salmon may be taken in the Chignik River with rod and reel from a point 300 ft upstream of the ADF&G weir to Chignik Lake from January 1 through August 9, with no daily harvest or possession limit.
 - Salmon may be taken by gillnet in Black Lake or any tributary to Black or Chignik lakes.

Federal subsistence salmon regulations for the Chignik Area are published in 36 CFR 242.27(e)(8). Additional information about the federal subsistence fishery is available by contacting the U.S. Fish and Wildlife Service, Office of Subsistence Management¹⁶ in Anchorage, Alaska. Additionally, a booklet providing a summary of federal subsistence fishing rules is published and accessible online: <https://www.doi.gov/subsistence/fisheries/>.

16. More information about the Federal Subsistence Management Program is available online: <https://www.doi.gov/subsistence>.

3. CHIGNIK MANAGEMENT AREA: BACKGROUND AND HOUSEHOLD SURVEY RESULTS

COMMUNITY BACKGROUND¹

The study communities of Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville located on the Alaska Peninsula are not connected by road but are all located within 40 miles of each other. The three Chignik communities that each share the name of the body of water to which they are adjacent—Chignik Lake, Chignik Lagoon, and Chignik Bay—are each separated by about 15 miles. The ADF&G Chignik River weir installed and operated each summer is located about halfway down the Chignik River: 1.5 miles from the community of Chignik Lake, three miles from Chignik Lagoon, and about 10 nautical miles from Chignik Bay.

Chignik Bay

The community of Chignik, also referred to as Chignik Bay (these two names may be used interchangeably throughout this report), is located on the south side of the Alaska Peninsula approximately 457 miles southwest of Anchorage. It is situated at the southern end of Chignik Bay at the head of Anchorage Bay (Figure 1-1). The community's backdrop involves a 3,000-foot mountain with the snow-capped Aleutian Range visible to the north. The mountains trap clouds, fog, and moisture, particularly on the Pacific side. Sand and strong winds associated with the region's frequent coastal storms inspired the Alutiiq people to name this community "Chignik" (spelled "*cihniq*"), which means "big wind" (Crowell et al. 2001).

The first reference to a settlement at Chignik Bay was by Ivan Petroff in 1880. He called it "*Kaluiak*" and described it as "a small village of about 30 'deer' [caribou] hunters" (Partnow 2001). In 1888, Chignik was established as a fishing community when fish prospectors from the Fisherman's Packing Company of Astoria, Oregon, set up a salmon saltery to prospect for fish (Davis 1986:91). In the 1890s, two canneries—Hume Brothers and Hume Company, and also the Pacific Steam Whaling Company—began operating in Chignik Bay (Tompkins and Meinhardt 2010:10). In 1905, Northwestern Fisheries Company purchased both canneries, but operated out of the Pacific Steam Whaling plant (Himes-Cornell et al. 2013; Morseth 2003:90, 94; Tompkins and Meinhardt 2010:10). Throughout the 20th century and until presently, numerous canneries and companies have operated out of Chignik Bay. By 2016, Trident Seafoods owned and operated the only remaining fish processing support facility in Chignik Bay. Trident Seafoods operated a shore-based cannery in Chignik Bay until 2008 when it burned down and has never been rebuilt; however, fish caught during the 2016 salmon season were processed by floating processors that tied up to the docks or anchored in Anchorage Bay.^{2,3}

Early cannery operations attracted immigrant workers from all over the world, including Scandinavia, Italy, China, Mongolia, Hawaii, and the Philippines; it was not until the 1920s that local Alutiiq people were offered employment by the canneries (Partnow 2001; Tompkins and Meinhardt 2010:11). Most individuals living in the Chignik area communities today identify themselves as descendants of the unions of Alutiiq people and immigrants from other villages along the coast of the Alaska Peninsula to Kodiak

1. Each of the study communities has been featured in previously published ADF&G Technical Papers that included a historical community background summary; as such, the following community background descriptions draw heavily from the latest Technical Paper publication, Hutchinson-Scarborough et al. (2016), that provided background information for these same study communities.
2. James Halpin, "Update on the Chignik Cannery Fire," *Anchorage Daily News*, July 21, 2008, <https://www.adn.com/voices/article/update-chignik-cannery-fire/2008/07/22/>, (accessed October 2019).
3. Trident Seafoods Corporation, "Our Story: Our Processing Plants—Chignik," <https://www.tridentseafoods.com/our-story/our-plants/> (accessed October 2019).

(Davis 1986:89; Partnow 2001:104; Tompkins and Meinhardt 2010:15–20). Since 1888, Chignik Bay has remained a center for commercial fishing and fish processing operations for the Chignik area. The fishing fleet has evolved from small boats and fish traps owned by the canneries to the privately owned hand and purse seine boats that are in operation today (Himes-Cornell et al. 2013:44–48; Partnow 2001:24; Sepez et al. 2005:301–304; Tompkins and Meinhardt 2010).

The Chignik canneries at one time processed shrimp, king crab, and Tanner crab (Hutchinson-Scarborough and Fall 1996:7). These fisheries increased the year-round fishing industry activity in Chignik Bay beginning in the 1970s as Kodiak shrimp and king crab harvests declined, and interest in the Chignik area increased (Jackson and Ruccio 2003:2). Each of these fisheries peaked in harvest by the late 1970s and began closing to commercial harvest beginning in 1981 (Stichert et al. 2016:10–14). The shrimp and king crab fisheries in the Chignik area have remained closed and have been classified by ADF&G as severely depressed, resulting in restrictions on subsistence harvests (ADF&G 1999).

The City of Chignik is part of the Lake and Peninsula borough and school district.⁴ Chignik Bay’s federally recognized tribe is the Chignik Bay Tribal Council; the tribal government is a member of the non-profit tribal consortium Bristol Bay Native Association (BBNA).⁵ The Alaska Native village corporation is Far West, Incorporated, and many tribal members are shareholders with the regional Bristol Bay Native Corporation (BBNC). Chignik Bay also was incorporated as a city in 1983. Chignik Bay maintains an Alutiiq culture and a subsistence way of life. Commercial fishing provides primary cash income.

Chignik Lagoon

The community of Chignik Lagoon is named because of its location on the south shore of Chignik Lagoon. The community is located about 460 miles southwest of Anchorage on the Pacific side of the Alaska Peninsula (Figure 1-1). Wind, fog, rain, and snow are common features of the area’s climate.

The community’s origins can be traced to Alaska Native (primarily Alutiiq), Scandinavian, and Russian ancestors, the latter of whom moved to the area from nearby Mitrofanía and Sutwik islands in the early 1900s (Morris 1987; Partnow 2001). Early accounts by a Russian priest describe a group of “Koniag Aleut” speakers who lived in five settlements situated along the shore of Chignik Lagoon and along the Chignik River in 1897. At that time, he described them as living in driftwood and thatch houses. He reported that they had used 20 bear skins to construct a prayer house and that they made money trading bear and fox skins (Morseth 2003).

The contemporary community of Chignik Lagoon developed as a fishing village because of the large sockeye salmon runs identified by northwest coast fish prospectors that came to Chignik in 1888. By 1889, three Oregon- and San Francisco-based seafood packing companies established canneries at the present site of the Chignik Lagoon community. By 1892, the three canneries had consolidated and were known as the “Chignik Bay Combination” and later became known as “Alaska Packers’ Association.” In addition, the Alaska Packers’ Association operated a coal mine on the Chignik River to assist the operations of the commercial fish processing industry and fisheries-related transportation (Knappen 1929). In 1896, there were 250 fishers and cannery workers employed by the Chignik Lagoon Alaska Packers’ Association. By 1897, most of the fishers were of Eastern European descent, and fish packers were of Chinese descent. It was not until the 1920s that local Alaska Natives were hired to work in the canneries and on the fish traps (Partnow 2001).

Another Alutiiq community located on the northeastern shore of Chignik Lagoon near the sand spit, known as “Old Village,” was originally occupied seasonally but grew into a year-round settlement that had a Russian Orthodox Church when the commercial salmon industry began to develop in 1889. In 1903, a summer school opened at the present site of the community of Chignik Lagoon. Chignik Lagoon became a

4. *Alaska Community Database Online*, s.v. “Chignik” (by Alaska Department of Commerce, Community, and Economic Development), <https://dcra-cdo-dcced.opendata.arcgis.com/> (accessed September 2019).

5. Bristol Bay Native Association, “Tribal Council List,” <https://bbna.com/our-communities/tribal-councils/tribal-council-list/> (accessed November 2019).

cultural and geographical boundary between the local Alaska Native community that lived primarily on the north side of Chignik Lagoon at “Old Village” and the newer community of mostly immigrant men residing on the south side of Chignik Lagoon at the present location of the community of Chignik Lagoon. In 1919, a flu epidemic decimated many of the Alaska Native residents, and “Old Village” was abandoned. Some of the survivors relocated to the present community of Chignik Lagoon, and others moved to Chignik Lake in 1960 and established a community there when a Russian Orthodox church and school were built.

Chignik Lagoon is part of the Lake and Peninsula borough and school district.⁶ Chignik Lagoon’s federally recognized tribe is the Native Village of Chignik Lagoon; its village corporation is the Chignik Lagoon Native Corporation. The tribal government is a member of BBNA and many tribal members are shareholders with the regional BBNC. The community maintains an Alutiiq culture and a subsistence way of life. Commercial fishing provides primary cash income.

Chignik Lake

The community of Chignik Lake is located on the south side of the Alaska Peninsula approximately 470 miles southwest of Anchorage near the outlet of Chignik Lake into the Chignik River. Wind, fog, rain, and snow are common features of the area’s climate. The lake is situated within a narrow pass that leads through the volcanic Aleutian Range from Bristol Bay near Port Heiden to the Pacific Ocean side of the Alaska Peninsula (Figure 1-1). The major watershed in the Chignik Management Area (CMA) serves as the freshwater rearing habitat for much of the salmon that spawn in the CMA. The Chignik watershed consists of different but linked habitats, including the Gulf of Alaska, Chignik Lagoon, Chignik River, Chignik Lake and its tributaries, and Black Lake and its tributaries (Sagalkin et al. 2013). Five species of Pacific salmon return to the Chignik watershed annually and must pass up the Chignik River to get to spawning areas. Sockeye salmon returns consist of both an early and a late run. These two sockeye salmon runs are genetically distinct, with the early run spawning primarily in Black Lake and its tributaries and the late run spawning in Chignik Lake and its tributaries (Templin et al. 1999). Chinook salmon spawn in the Chignik River, which is the only Chinook salmon-producing stream in the CMA. Pink, chum, and coho salmon spawn throughout the CMA, including in the Chignik watershed (Wilburn and Renick 2018:1, 5, 7–8). The residents of Chignik Lake use all five species of salmon that run up the river and fish are easily accessible from the waters bordering the community.

Although Chignik Bay and Chignik Lagoon were founded around fishing and fish processing, the Chignik Lake community can trace its lineage back to an individual named Dora Artemie Lind Andre (Hutchinson-Scarborough et al. 2016:14–15). The current location of the community of Chignik Lake during the early 20th century was used as a fall fishing and trapping camp for at least one family—that of Rodeonoff Artemie and his wife Natalia Abrom (Davis 1986:44–45). Rodeonoff Artemie was from Old Harbor on Kodiak Island, and Natalia Abrom was from Ugashik. They lived in Bear River, a now-abandoned village located on the Bristol Bay side of the Alaska Peninsula between Port Moller and Port Heiden. Bear River is where one of their daughters, Dora Artemie, was born in 1903 (Davis 1986:45). The Artemies and their children lived a seasonal lifestyle, living primarily in Chignik Lagoon at “Old Village” near the spit, but moving to Chignik Lake in the fall and winter where fish and game were more readily available and to trap. Dora married Frederick Lindholm (later shortened to Lind); Frederick Lind was born in 1901 in the once-populated village of Mitrofanina. Dora and her husband and children continued to winter at Chignik Lake using cabins both on Clarks River and Chignik Lake, but the children were sent to school in Port Heiden and Pilot Point (Davis 1986:45; Morris 1987:29). Dora’s husband passed away circa 1933⁷ and she remarried John Wanka Andre⁸ of Chignik Bay. Dora and her second husband settled at the present location of Chignik

6. *Alaska Community Database Online*, s.v. “Chignik Lagoon” (by Alaska Department of Commerce, Community, and Economic Development), <https://dcra-cdo-dcced.opendata.arcgis.com/> (accessed September 2019).

7. Geni.com, “Frederick Lind,” <https://www.geni.com/people/Frederick-Lind/6000000033432595048> (accessed November 2019).

8. Geni.com, “John Wanka Andre,” <https://www.geni.com/people/John-Andre/6000000044219052948> (accessed November 2019).

Lake in the 1960s. At this time, the first school in Chignik Lake was constructed by Dora's family as well as other people who had moved to Chignik Lake from Old Village, and also from communities located on the Bristol Bay and Pacific Ocean sides of the Alaska Peninsula, including Kanatak, Ilnik, and Port Moller. A Russian Orthodox church was also established in the 1960s. In addition to the church and school, the year-round availability of wild foods attracted several families from Perryville, Chignik Bay, and Chignik Lagoon that relocated to the Chignik Lake community. Many Chignik Lake families stayed at summer fish camps and homes along Chignik Lagoon, a tradition that continued until about 2002 (Hutchinson-Scarborough et al. 2016; Morris 1987). Chignik Lake residents have close connections with residents of Perryville, and, to a lesser extent, Chignik Lagoon and Chignik Bay (Partnow 2001). There is evidence that over the last decade there have been increased connections between Chignik Lake and Port Heiden due to employment opportunities for Chignik Lake residents in Port Heiden, or through marriages (Hutchinson-Scarborough et al. 2016).

Chignik Lake is part of the Lake and Peninsula borough and school district.⁹ Chignik Lake's federally recognized tribe is the Chignik Lake Village, and the Alaska Native village corporation is Chignik River Limited. The tribe is represented by the BBNA and many of their tribal members are shareholders with the regional BBNC. The community maintains an Alutiiq culture and a subsistence way of life. Commercial fishing provides primary cash income opportunities.

Perryville

The community of Perryville is located on the Pacific Coast of the Alaska Peninsula approximately 500 miles southwest of Anchorage (Figure 1-1). North of Perryville sits Mt. Veniaminof, an active volcano. Its snow-topped peaks supply melted water to create the Kametolook, Three Star, and Long Beach rivers.

Perryville's origins can be traced to the eruption of the Mt. Novarupta volcano on June 6, 1912. At the time of the eruption, the founders of Perryville were residing in the two small communities of Kaguyak (Douglas) and Katmai in what is now Katmai National Park and Preserve on the Pacific coastline of the Alaska Peninsula (Partnow 2001). When the volcano erupted, local families had already moved to summer fish camps on Kafia Bay to participate in commercial fish operations and there were no casualties from the eruption at Kaguyak or Katmai; however, the eruption forced the long-term evacuation of these communities (Morris 1987:43). The U.S. Coast Guard dispatched rescue resources to bring people to Kodiak Island, and, after a short stay, Captain K. W. Perry transported displaced residents on the cutter *Manning* to a new site (Morris 1987:43). The new settlement was initially called "Perry" after Captain K. W. Perry, and in 1930 the name changed to "Perryville" to comply with U.S. Postal Service community name requirements (Hutchinson-Scarborough et al. 2016:17).

Though Perryville's location and resources are not as closely situated to the Chignik watershed where most commercial salmon fishing occurs by comparison to most of the other study communities, this project—as well as previous research conducted by the Division of Subsistence—found several residents of Perryville have always participated in the CMA salmon fisheries. Many families have traditionally relocated in the summer to camps and homes located along the north side of Chignik Lagoon where fish were often put away for subsistence, and the camps also provided a summer home base for the family or member of the family who was commercial fishing. The number of families that continued to use summer camps has declined significantly over the last decade (Hutchinson-Scarborough et al. 2016; Hutchinson-Scarborough and Fall 1996; Morris 1987); however, as of 2013, three families continued to spend their summers in Chignik Lagoon at their summer camp while they also commercial fished for salmon (Hutchinson-Scarborough et al. 2016). According to researcher notes taken during survey administration for this project, the same families were still using these homes in the summer of 2016. The community has maintained a steady population and strong ties to the Alutiiq culture and a subsistence way of life. Perryville residents have close connections with residents of Chignik Lake, and, to a lesser extent, Chignik Lagoon and Chignik Bay (Hutchinson-Scarborough et al. 2016; Partnow 2001).

9. *Alaska Community Database Online*, s.v. "Chignik Lake" (by Alaska Department of Commerce, Community, and Economic Development), <https://dcra-cdo-dcced.opendata.arcgis.com/> (accessed September 2019).

Perryville is part of the Lake and Peninsula borough and school district.¹⁰ Perryville’s federally recognized tribe is the Native Village of Perryville, and Oceanside Corporation is the community’s local Alaska Native village corporation. Their tribal community is represented by the BBNA and many members are shareholders with the regional BBNC. Commercial fishing provides the primary cash income, as well as a few jobs with government or non-profit organizations.¹¹

POPULATION ESTIMATES AND DEMOGRAPHIC INFORMATION

Chignik Bay: 2014–2016

Chignik Bay’s population fluctuates greatly from winter to summer because of commercial fishing and fish processing operations. However, there is a core number of people who live in the community year-round and claim Chignik Bay as their residence. The 2010 decennial census identified 41 occupied households in Chignik Bay with a total population of 91 residents, of which 56 (62%) were Alaska Native (Figure 3-1; Table 3-1). The American Community Survey (ACS) conducted by the U.S. Census Bureau for 2014 identified that Chignik Bay had a five-year average total population of 86 people, of which 47 (55%) were Alaska Native; in 2015, the average population was 70 people, of which 38 (54%) were Alaska Native; and, in 2016, according to the ACS average estimate there were 40 residents, of which 28 (70%) were Alaska Native.

A survey of all Chignik Bay households was attempted, and sample achievement ranged 76%–89% of households surveyed (Table 3-1). Based on the demographic data collected from surveyed households for Chignik Bay, survey results estimated a total population in 2014 of 77 people residing in 30 households, of which 50 people (66% of population) identified themselves as being Alaska Native. In 2015, the population was estimated to be 71 people residing in 29 households, of which 46 people (77% of population) identified themselves as Alaska Native. The third year of the study, Chignik Bay’s estimated population for 2016 was like 2014 with 77 people residing in 27 households, of which 59 people (77% of population) identified themselves as Alaska Native. In comparison to the ACS average estimates, the division’s survey results estimated a slightly higher proportion of the population was Alaska Native in each study year (Figure 3-1).

The Alaska Department of Labor (ADL) estimated Chignik Bay’s 2014 population to be 82 people; in both 2015 and 2016, ADL’s population estimate was 95 people (Figure 3-2). The U.S. Census Bureau and the earliest ADL estimates, which started in 1984, both show that after decreasing through the 1950s and 1960s, the population of Chignik Bay grew following 1970 until it peaked in 1990 with a total population of 188. Since then, the population has fluctuated from as high as 178 in 1993 to as low as 77 in 2008. Note that the survey-based population estimates for the study years—71 to 77—are among the lowest since 2000. Several events likely contributed to population declines since 1990 in Chignik Bay; furthermore, it is likely several of the same factors also influenced population changes in the nearby study communities of Chignik Lagoon and Chignik Lake. To start, the Alaska recession in the mid- to late-1980s, and the 1989 *Exxon Valdez* oil spill, affected communities throughout the state (Fall et al. 1995). Within the Chignik region, in 1991, the Columbia Ward Fisheries fish processing facility closed, which was a support facility for the local fishing fleet and included a store located in Chignik Lagoon. Additionally, in the 2000s there were negative economic effects from the Chignik Salmon Cooperative—a harvesting cooperative sharing a commercial fishery allocation—that resulted in declining ex-vessel values of Chignik salmon harvests, and a shore-based cannery fire¹² in 2008 at Trident Seafoods in Chignik Bay (the cannery was never rebuilt) that resulted

10. *Alaska Community Database Online*, s.v. “Perryville” (by Alaska Department of Commerce, Community, and Economic Development), <https://dcra-cdo-dcced.opendata.arcgis.com/> (accessed September 2019).

11. Lake and Peninsula Borough. 2012. “Lake and Peninsula Borough Comprehensive Plan: Perryville Community Action Plan.” <http://www.lakeandpen.com/common/pages/DisplayFile.aspx?itemId=1577079> (accessed November 2019).

12. James Halpin, “Update on the Chignik Cannery Fire,” *Anchorage Daily News*, July 21, 2008, <https://www.adn.com/voices/article/update-chignik-cannery-fire/2008/07/22/>, (accessed October 2019).

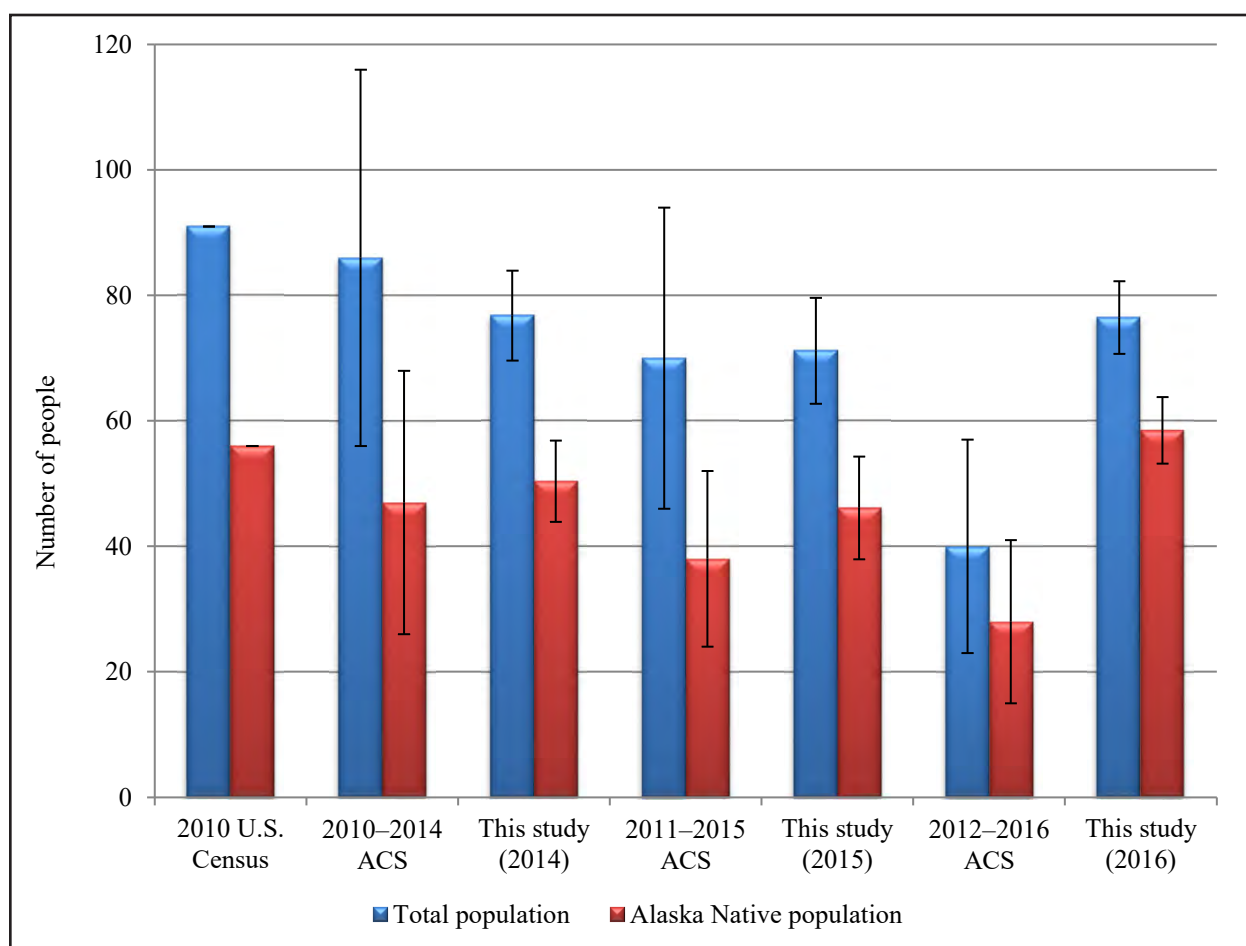


Figure 3-1.—Alaska Native and overall population estimates, Chignik Bay, 2010 and 2014–2016.

in loss of fish tax revenue and jobs to the City of Chignik (Hutchinson-Scarborough et al. 2016:180–181; Knapp 2007; Knapp and Hill 2003; Wilburn and Stumpf 2017:7).^{13, 14}

The study found that the ratio of males to females residing in Chignik Bay increased from 2014 to 2016. In 2014, there was a slightly lower population of 37 males (48%) compared to 40 females (52%) (Figure 3-3; Table 3-2). In 2015, there were slightly more males (37; 52%) than females (34; 48%) (Figure 3-4; Table 3-3). In 2016, the population was 41 males (53%) to 36 females (47%) (Figure 3-5; Table 3-4). The population exhibited a strong youth element: 17%–28% of the total population was 9 years old or younger in all three study years. Among adults, there tended to be more people belonging in the 55–59 and 30–34 age cohorts in each study year, but the oldest populated age cohorts spanned 80–89.

The mean household size in all three study years was similar with 2.6 in 2014, 2.5 in 2015, and 2.8 in 2016 (Table 3-1). The mean age of residents lowered throughout the study years—averaging 37 years old in 2014 and reducing to 32 in 2016—and each year there was at least one resident who was less than 1 year old. The average length of residency by household heads was not asked in 2014, but in 2015 the mean was 27 years with the maximum being 84 years; then, in 2016, the mean was 31 years with the maximum being 85 years.

13. *Alaska Board of Fisheries Meeting Information*, s.v. “Search for meetings: 2019, Anchorage, Alaska Peninsula/Aleutian Islands Areas (All Finfish); Meeting documents: On-Time Public Comments (On-Time Public Comment List, Alaska Board of Fisheries, Alaska Peninsula/Chignik/Bering Sea-Aleutian Islands, Finfish, Anchorage, AK, February 21–26, 2019; pages 57–58)” by Alaska Department of Fish and Game), <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo> (accessed November 2019).

14. Trident Seafoods Corporation. 2019. “Our Plants: Chignik.” <https://www.tridentseafoods.com/our-story/our-plants/> (accessed December 2019).

Table 3-1.—Sample and demographic characteristics, Chignik Bay, 2010 and 2014–2016.

Characteristics	Chignik Bay		
	2014	2015	2016
Sampled households	25	22	24
Eligible households	30	29	27
Percentage sampled	83.3%	75.9%	88.9%
Sampled population	64	54	68
Estimated community population	76.8	71.2	76.5
Range ^a	70 – 84	63 – 80	71 – 82
Household size			
Mean	2.6	2.5	2.8
Minimum	1	1	1
Maximum	6	6	7
Age			
Mean	36.9	35.3	32.1
Minimum ^b	0	0	0
Maximum	83	84	85
Median	38	34.5	31
Length of residency^c			
Total population			
Mean		20.8	21.1
Minimum ^b		0	0
Maximum		84	85
Heads of household			
Mean		27.2	30.8
Minimum ^b		0	1
Maximum		84	85
Alaska Native			
Estimated households ^d			
Number	21.6	22.4	23.6
Percentage	72.0%	77.3%	87.5%
Estimated population			
Number	50.4	46.1	58.5
Percentage	65.6%	64.8%	76.5%
Range ^a	44 – 57	38 – 54	53 – 64
U.S. Census 2010^e			
Households	41	41	41
Population	91	91	91
Alaska Native population	56	56	56

-continued-

Table 3-1.–Page 2 of 2.

Characteristics	Chignik Bay		
	2014	2015	2016
American Community Survey			
5-year average^e			
Population	86.0	70.0	40.0
Range ^f	56 – 116	46 – 94	23 – 57
Alaska Native population	47.0	38.0	28.0
Range ^f	26 – 68	24 – 52	15 – 41

Source ADF&G Division of Subsistence household surveys, 2015–2017.

a. Estimated range is 95% confidence interval.

b. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.

c. Length of residency not asked for 2014 surveys.

d. The estimated number of households in which at least one head of household is Alaska Native.

e. Source is U.S. Census Bureau (n.d.) for 2010 decennial census data, and for American Community Survey (ACS) five-year estimates for 2014 (2010–2014), 2015 (2011–2015), and 2016 (2012–2016).

f. ACS data range is the reported margin of error.

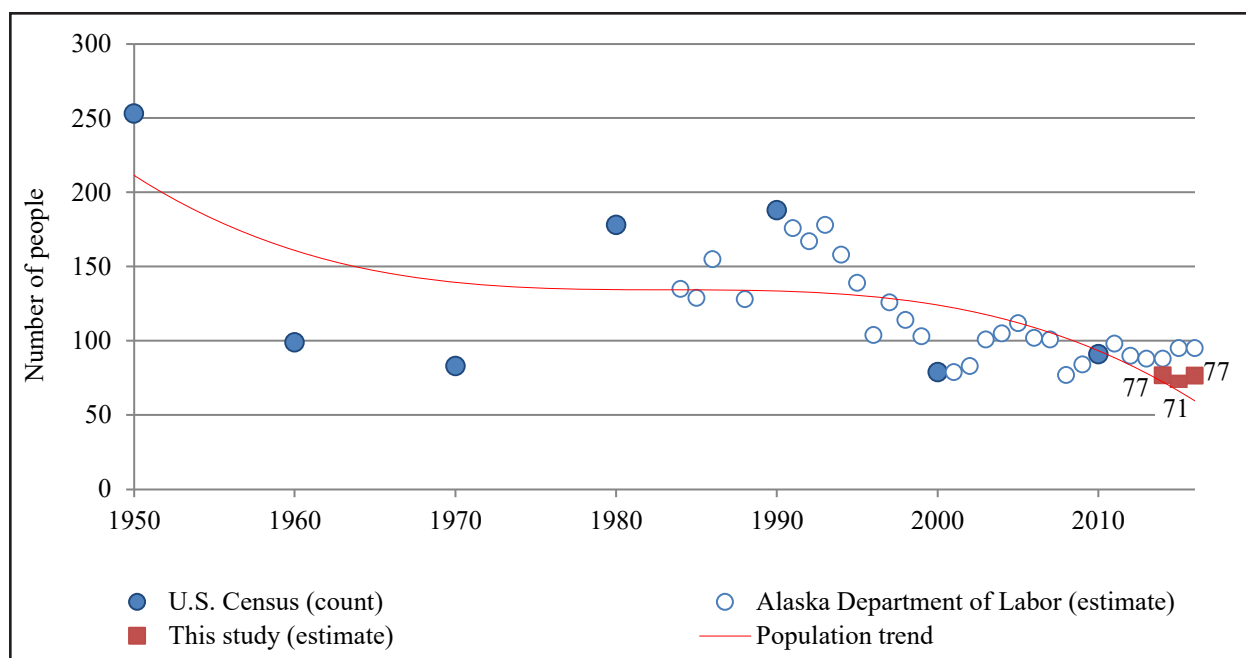


Figure 3-2.–Historical population estimates, Chignik Bay, 1960–2016.

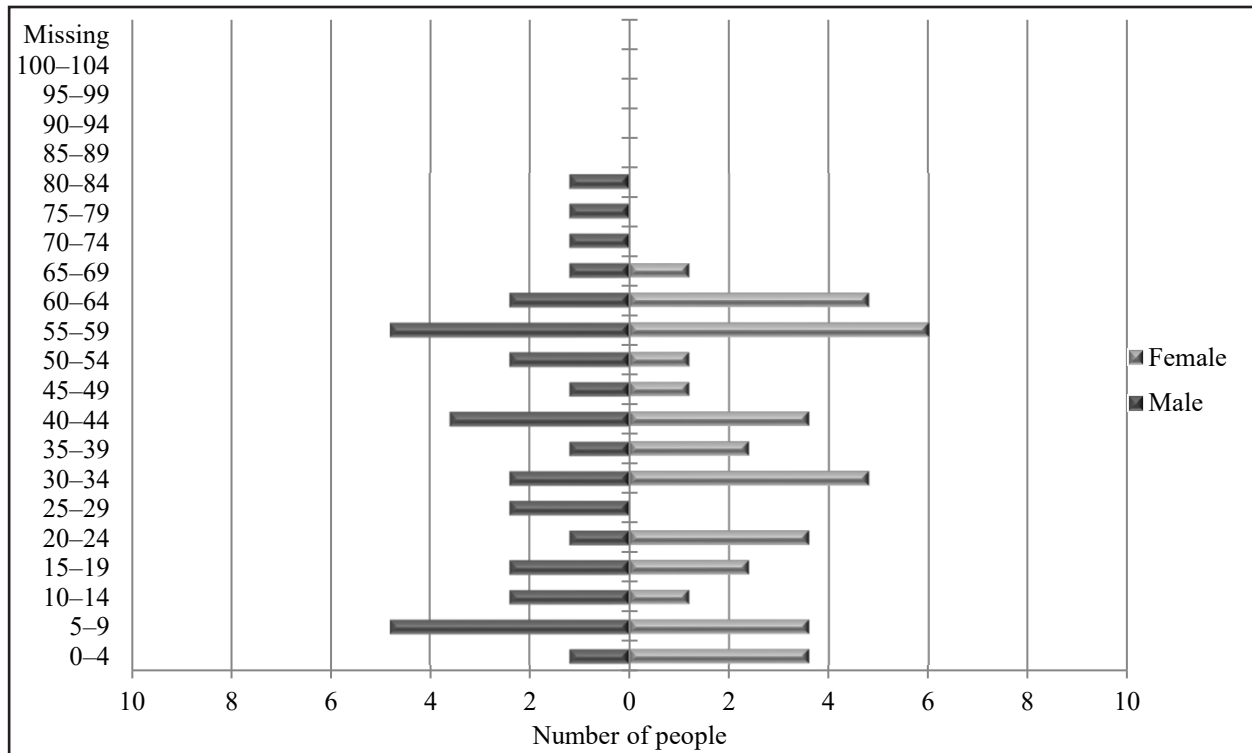


Figure 3-3.—Population profile, Chignik Bay, 2014.

Table 3-2.—Population profile, Chignik Bay, 2014.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0-4	1.2	3.2%	3.2%	3.6	9.1%	9.1%	4.8	6.3%	6.3%
5-9	4.8	12.9%	16.1%	3.6	9.1%	18.2%	8.4	10.9%	17.2%
10-14	2.4	6.5%	22.6%	1.2	3.0%	21.2%	3.6	4.7%	21.9%
15-19	2.4	6.5%	29.0%	2.4	6.1%	27.3%	4.8	6.3%	28.1%
20-24	1.2	3.2%	32.3%	3.6	9.1%	36.4%	4.8	6.3%	34.4%
25-29	2.4	6.5%	38.7%	0.0	0.0%	36.4%	2.4	3.1%	37.5%
30-34	2.4	6.5%	45.2%	4.8	12.1%	48.5%	7.2	9.4%	46.9%
35-39	1.2	3.2%	48.4%	2.4	6.1%	54.5%	3.6	4.7%	51.6%
40-44	3.6	9.7%	58.1%	3.6	9.1%	63.6%	7.2	9.4%	60.9%
45-49	1.2	3.2%	61.3%	1.2	3.0%	66.7%	2.4	3.1%	64.1%
50-54	2.4	6.5%	67.7%	1.2	3.0%	69.7%	3.6	4.7%	68.8%
55-59	4.8	12.9%	80.6%	6.0	15.2%	84.8%	10.8	14.1%	82.8%
60-64	2.4	6.5%	87.1%	4.8	12.1%	97.0%	7.2	9.4%	92.2%
65-69	1.2	3.2%	90.3%	1.2	3.0%	100.0%	2.4	3.1%	95.3%
70-74	1.2	3.2%	93.5%	0.0	0.0%	100.0%	1.2	1.6%	96.9%
75-79	1.2	3.2%	96.8%	0.0	0.0%	100.0%	1.2	1.6%	98.4%
80-84	1.2	3.2%	100.0%	0.0	0.0%	100.0%	1.2	1.6%	100.0%
85-89	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
90-94	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
95-99	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
100-104	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Missing	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Total	37.2	100.0%	100.0%	39.6	100.0%	100.0%	76.8	100.0%	100.0%

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

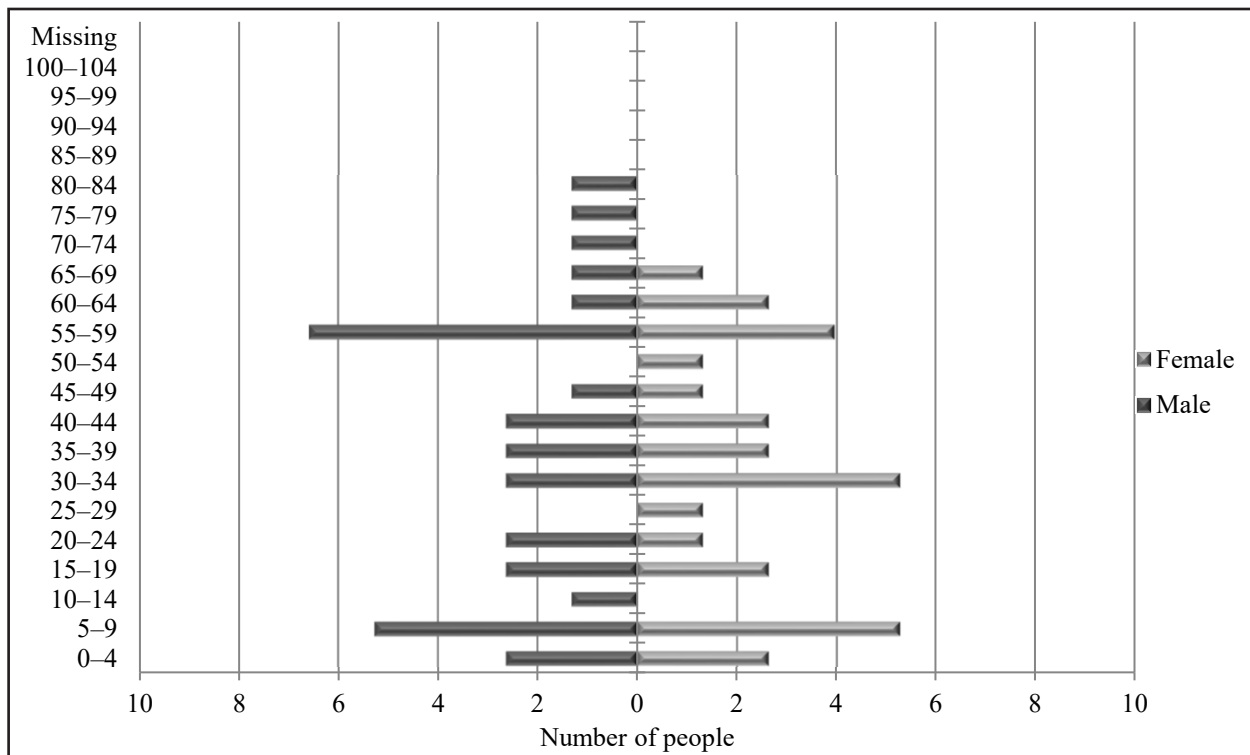


Figure 3-4. Population profile, Chignik Bay, 2015.

Table 3-3. Population profile, Chignik Bay, 2015.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0-4	2.6	7.1%	7.1%	2.6	7.7%	7.7%	5.3	7.4%	7.4%
5-9	5.3	14.3%	21.4%	5.3	15.4%	23.1%	10.5	14.8%	22.2%
10-14	1.3	3.6%	25.0%	0.0	0.0%	23.1%	1.3	1.9%	24.1%
15-19	2.6	7.1%	32.1%	2.6	7.7%	30.8%	5.3	7.4%	31.5%
20-24	2.6	7.1%	39.3%	1.3	3.8%	34.6%	4.0	5.6%	37.0%
25-29	0.0	0.0%	39.3%	1.3	3.8%	38.5%	1.3	1.9%	38.9%
30-34	2.6	7.1%	46.4%	5.3	15.4%	53.8%	7.9	11.1%	50.0%
35-39	2.6	7.1%	53.6%	2.6	7.7%	61.5%	5.3	7.4%	57.4%
40-44	2.6	7.1%	60.7%	2.6	7.7%	69.2%	5.3	7.4%	64.8%
45-49	1.3	3.6%	64.3%	1.3	3.8%	73.1%	2.6	3.7%	68.5%
50-54	0.0	0.0%	64.3%	1.3	3.8%	76.9%	1.3	1.9%	70.4%
55-59	6.6	17.9%	82.1%	4.0	11.5%	88.5%	10.5	14.8%	85.2%
60-64	1.3	3.6%	85.7%	2.6	7.7%	96.2%	4.0	5.6%	90.7%
65-69	1.3	3.6%	89.3%	1.3	3.8%	100.0%	2.6	3.7%	94.4%
70-74	1.3	3.6%	92.9%	0.0	0.0%	100.0%	1.3	1.9%	96.3%
75-79	1.3	3.6%	96.4%	0.0	0.0%	100.0%	1.3	1.9%	98.1%
80-84	1.3	3.6%	100.0%	0.0	0.0%	100.0%	1.3	1.9%	100.0%
85-89	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
90-94	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
95-99	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
100-104	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Missing	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Total	36.9	100.0%	100.0%	34.3	100.0%	100.0%	71.2	100.0%	100.0%

Source: ADF&G Division of Subsistence household surveys, 2016.

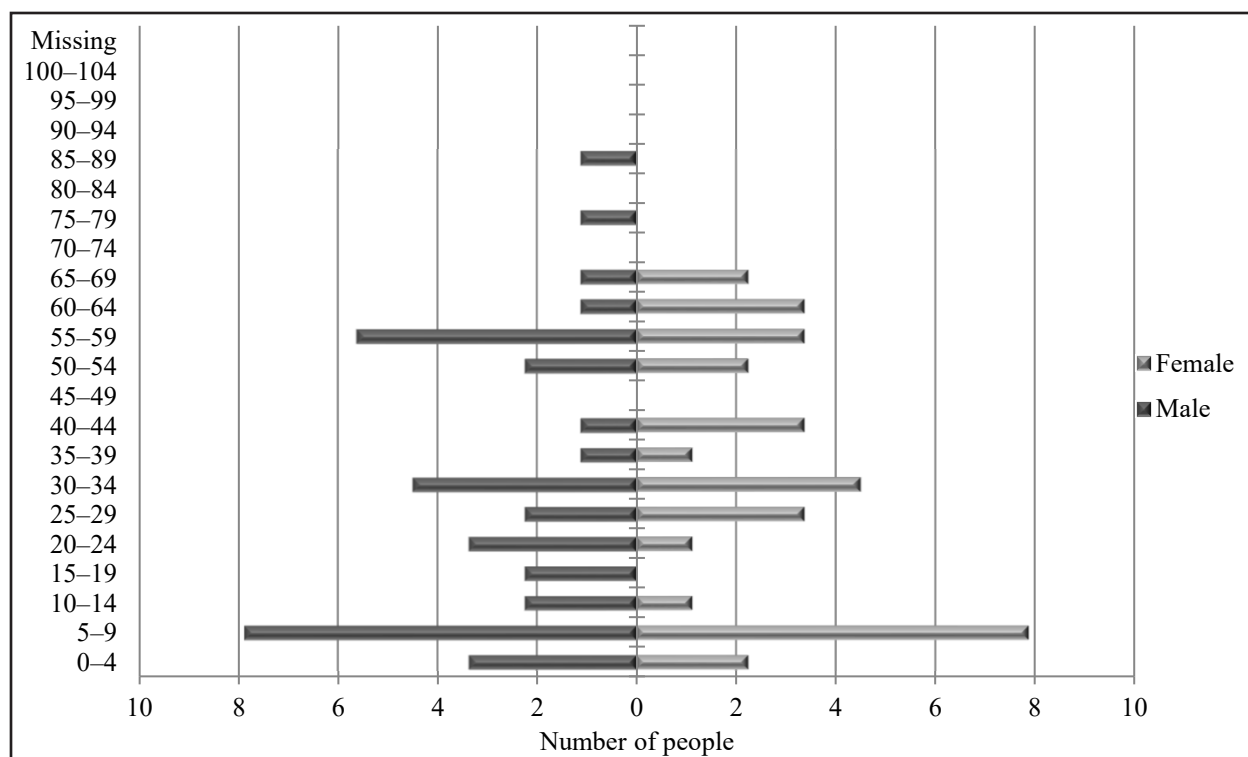


Figure 3-5.—Population profile, Chignik Bay, 2016.

Table 3-4.—Population profile, Chignik Bay, 2016.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0-4	3.4	8.3%	8.3%	2.3	6.3%	6.3%	5.6	7.4%	7.4%
5-9	7.9	19.4%	27.8%	7.9	21.9%	28.1%	15.8	20.6%	27.9%
10-14	2.3	5.6%	33.3%	1.1	3.1%	31.3%	3.4	4.4%	32.4%
15-19	2.3	5.6%	38.9%	0.0	0.0%	31.3%	2.3	2.9%	35.3%
20-24	3.4	8.3%	47.2%	1.1	3.1%	34.4%	4.5	5.9%	41.2%
25-29	2.3	5.6%	52.8%	3.4	9.4%	43.8%	5.6	7.4%	48.5%
30-34	4.5	11.1%	63.9%	4.5	12.5%	56.3%	9.0	11.8%	60.3%
35-39	1.1	2.8%	66.7%	1.1	3.1%	59.4%	2.3	2.9%	63.2%
40-44	1.1	2.8%	69.4%	3.4	9.4%	68.8%	4.5	5.9%	69.1%
45-49	0.0	0.0%	69.4%	0.0	0.0%	68.8%	0.0	0.0%	69.1%
50-54	2.3	5.6%	75.0%	2.3	6.3%	75.0%	4.5	5.9%	75.0%
55-59	5.6	13.9%	88.9%	3.4	9.4%	84.4%	9.0	11.8%	86.8%
60-64	1.1	2.8%	91.7%	3.4	9.4%	93.8%	4.5	5.9%	92.6%
65-69	1.1	2.8%	94.4%	2.3	6.3%	100.0%	3.4	4.4%	97.1%
70-74	0.0	0.0%	94.4%	0.0	0.0%	100.0%	0.0	0.0%	97.1%
75-79	1.1	2.8%	97.2%	0.0	0.0%	100.0%	1.1	1.5%	98.5%
80-84	0.0	0.0%	97.2%	0.0	0.0%	100.0%	0.0	0.0%	98.5%
85-89	1.1	2.8%	100.0%	0.0	0.0%	100.0%	1.1	1.5%	100.0%
90-94	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
95-99	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
100-104	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Missing	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Total	40.5	100.0%	100.0%	36.0	100.0%	100.0%	76.5	100.0%	100.0%

Source ADF&G Division of Subsistence household surveys, 2017.

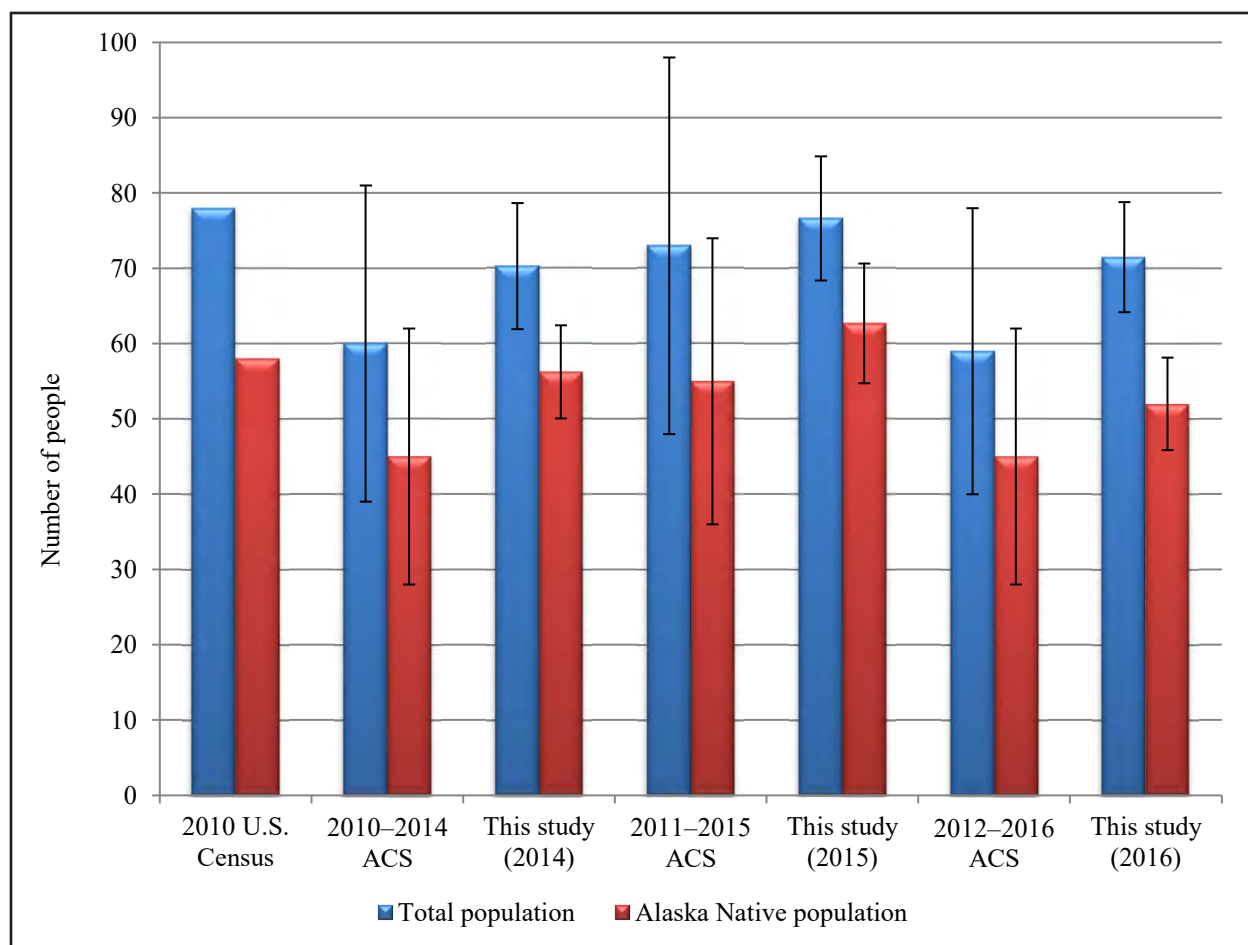


Figure 3-6.—Alaska Native and overall population estimates, Chignik Lagoon, 2010 and 2014–2016.

Chignik Lagoon: 2014–2016

Chignik Lagoon’s population fluctuates greatly from winter to summer because of the commercial and subsistence fishing opportunities and changes to employment opportunities. In some years during the busy fishing season, the population of Chignik Lagoon triples in size from the core group of year-round residents (Chignik Lagoon Village Council 2016). The U.S. Census Bureau’s 2010 census found that Chignik Lagoon had 29 occupied households with a total population of 78 people, of which 58 (74%) were Alaska Native (Figure 3-6; Table 3-5). The ACS five-year average total population estimate for 2010–2014 was 60 people, of which 45 (75%) were Alaska Native; the ACS average estimate for 2015 was 73 people, of which 55 (75%) were Alaska Native; and the 2016 average estimate was 59 people, of which 45 (76%) were Alaska Native.

A survey of all Chignik Lagoon households was attempted, and sample achievement ranged 64%–79% of households surveyed (Table 3-5). Based on the demographic data collected from surveyed households for Chignik Lagoon, survey results estimated a total population in 2014 of 70 people residing in 25 households, of which 56 people (80% of population) identified themselves as Alaska Native. In 2015, the population was estimated to be 77 people residing in 26 households, of which 63 people (82% of population) identified themselves as Alaska Native. For the third year of the study, Chignik Lagoon’s estimated population was 72 people residing in 26 households, of which 52 people (73% of population) were Alaska Native. According to both the estimates based on surveys administered for this project and the ACS average population, in 2015 the population was slightly increased compared to 2014 and 2016 (Figure 3-6).

Table 3-5.—Sample and demographic characteristics, Chignik Lagoon, 2010 and 2014–2016.

Characteristics	Chignik Lagoon		
	2014	2015	2016
Sampled households	16	19	20
Eligible households	25	26	26
Percentage sampled	64.0%	73.1%	76.9%
Sampled population	45	56	55
Estimated community population	70.3	76.6	71.5
Range ^a	62 – 79	68 – 68	64 – 79
Household size			
Mean	2.8	2.9	2.8
Minimum	1.0	1.0	1.0
Maximum	5.0	5.0	5.0
Age			
Mean	35.2	33.3	35.6
Minimum ^b	1	0	0
Maximum	66	75	69
Median	38	38	37
Length of residency^c			
Total population			
Mean		23.2	24.5
Minimum ^b		0	0
Maximum		65	65
Heads of household			
Mean		33.4	31.3
Minimum ^b		1	0
Maximum		65	65
Alaska Native			
Estimated households ^d			
Number	25.0	24.6	24.7
Percentage	100.0%	94.7%	95.0%
Estimated population			
Number	56.3	62.7	52.0
Percentage	80.0%	81.8%	72.7%
Range ^a	50 – 62	55 – 71	46 – 58
U.S. Census 2010^e			
Households	29	29	29
Population	78	78	78
Alaska Native population	58	58	58

-continued-

Table 3-5.–Page 2 of 2.

Characteristics	Chignik Lagoon		
	2014	2015	2016
American Community Survey 5-year average^e			
Population	60	73	59
Range ^f	39 – 81	48 – 98	40 – 78
Alaska Native population	45	55	45
Range ^f	28 – 62	36 – 74	28 – 62

Source ADF&G Division of Subsistence household surveys, 2015–2017.

a. Estimated range is 95% confidence interval.

b. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.

c. Length of residency not asked for 2014 surveys.

d. The estimated number of households in which at least one head of household is Alaska Native.

e. Source is U.S. Census Bureau (n.d.) for 2010 decennial census data, and for American Community Survey (ACS) five-year estimates for 2014 (2010–2014), 2015 (2011–2015), and 2016 (2012–2016).

f. ACS data range is the reported margin of error.

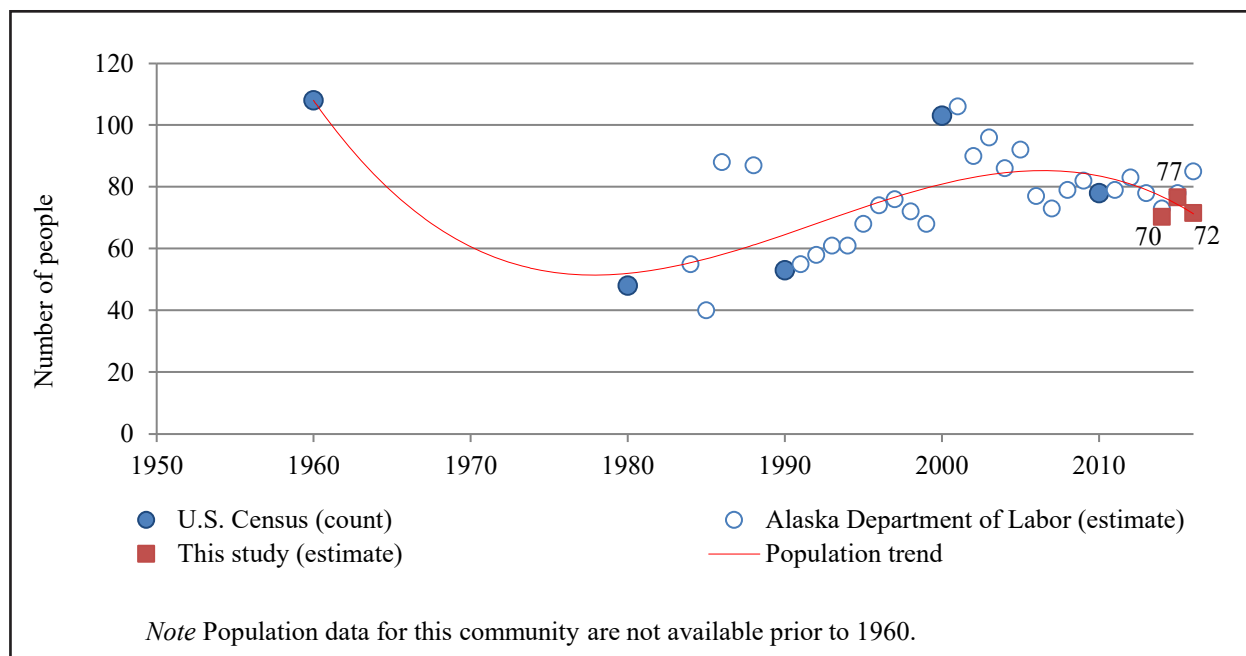


Figure 3-7.–Historical population estimates, Chignik Lagoon, 1960–2016.

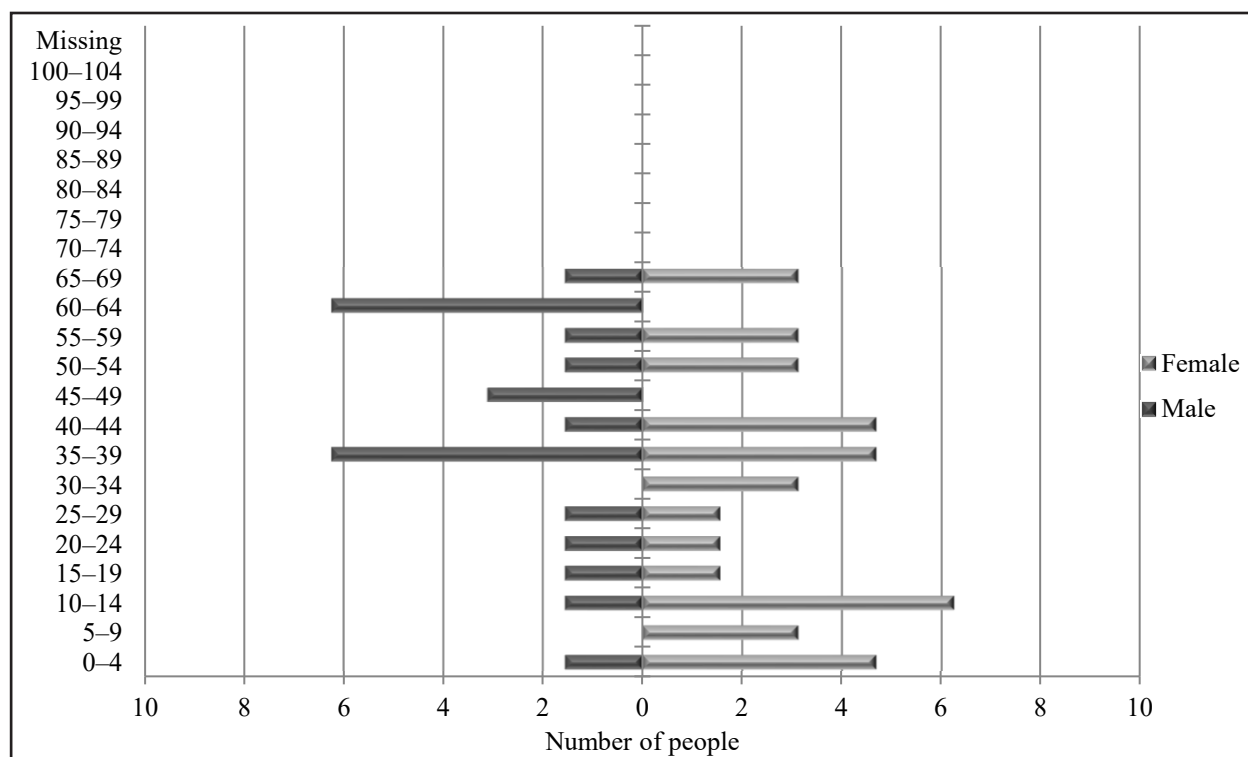


Figure 3-8.—Population profile, Chignik Lagoon, 2014.

Table 3-6.—Population profile, Chignik Lagoon, 2014.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0-4	1.6	5.3%	5.3%	4.7	11.5%	11.5%	6.3	8.9%	8.9%
5-9	0.0	0.0%	5.3%	3.1	7.7%	19.2%	3.1	4.4%	13.3%
10-14	1.6	5.3%	10.5%	6.3	15.4%	34.6%	7.8	11.1%	24.4%
15-19	1.6	5.3%	15.8%	1.6	3.8%	38.5%	3.1	4.4%	28.9%
20-24	1.6	5.3%	21.1%	1.6	3.8%	42.3%	3.1	4.4%	33.3%
25-29	1.6	5.3%	26.3%	1.6	3.8%	46.2%	3.1	4.4%	37.8%
30-34	0.0	0.0%	26.3%	3.1	7.7%	53.8%	3.1	4.4%	42.2%
35-39	6.3	21.1%	47.4%	4.7	11.5%	65.4%	10.9	15.6%	57.8%
40-44	1.6	5.3%	52.6%	4.7	11.5%	76.9%	6.3	8.9%	66.7%
45-49	3.1	10.5%	63.2%	0.0	0.0%	76.9%	3.1	4.4%	71.1%
50-54	1.6	5.3%	68.4%	3.1	7.7%	84.6%	4.7	6.7%	77.8%
55-59	1.6	5.3%	73.7%	3.1	7.7%	92.3%	4.7	6.7%	84.4%
60-64	6.3	21.1%	94.7%	0.0	0.0%	92.3%	6.3	8.9%	93.3%
65-69	1.6	5.3%	100.0%	3.1	7.7%	100.0%	4.7	6.7%	100.0%
70-74	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
75-79	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
80-84	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
85-89	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
90-94	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
95-99	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
100-104	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Missing	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Total	29.7	100.0%	100.0%	40.6	100.0%	100.0%	70.3	100.0%	100.0%

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

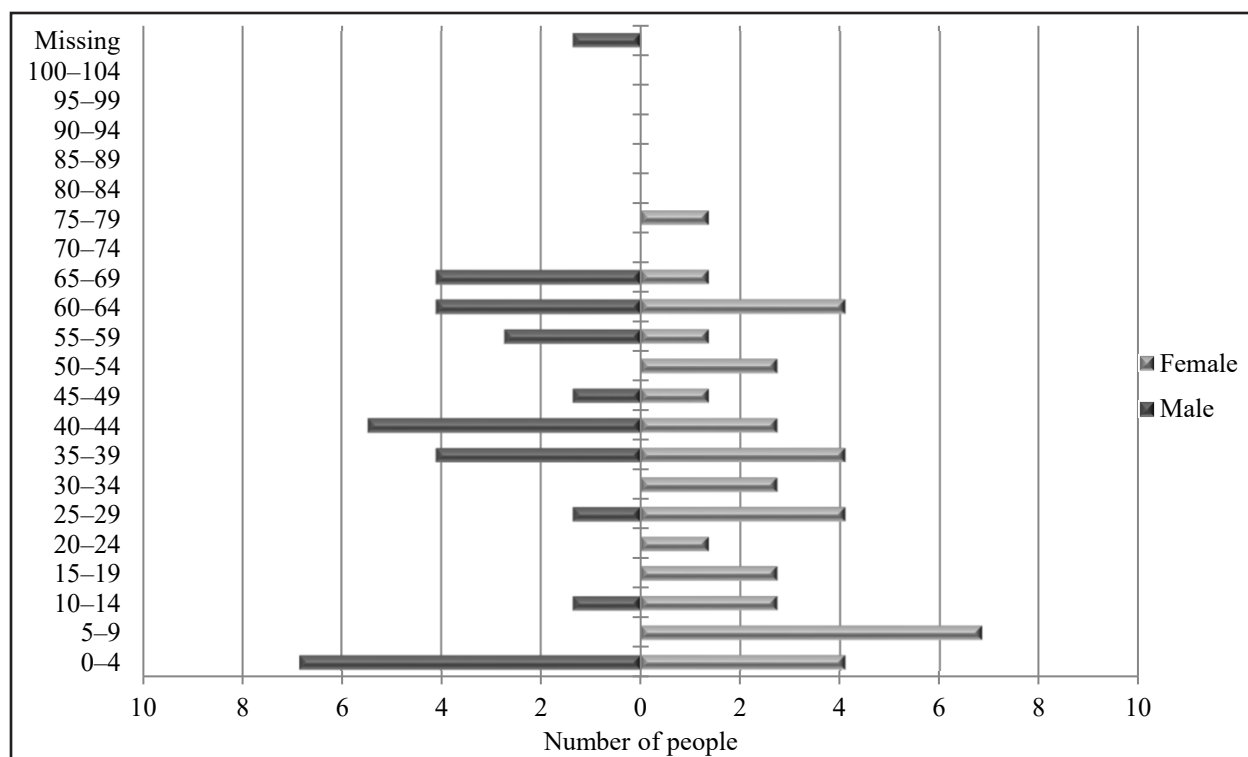


Figure 3-9.–Population profile, Chignik Lagoon, 2015.

Table 3-7.–Population profile, Chignik Lagoon, 2015.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	6.8	20.8%	20.8%	4.1	9.4%	9.4%	10.9	14.3%	14.3%
5–9	0.0	0.0%	20.8%	6.8	15.6%	25.0%	6.8	8.9%	23.2%
10–14	1.4	4.2%	25.0%	2.7	6.3%	31.3%	4.1	5.4%	28.6%
15–19	0.0	0.0%	25.0%	2.7	6.3%	37.5%	2.7	3.6%	32.1%
20–24	0.0	0.0%	25.0%	1.4	3.1%	40.6%	1.4	1.8%	33.9%
25–29	1.4	4.2%	29.2%	4.1	9.4%	50.0%	5.5	7.1%	41.1%
30–34	0.0	0.0%	29.2%	2.7	6.3%	56.3%	2.7	3.6%	44.6%
35–39	4.1	12.5%	41.7%	4.1	9.4%	65.6%	8.2	10.7%	55.4%
40–44	5.5	16.7%	58.3%	2.7	6.3%	71.9%	8.2	10.7%	66.1%
45–49	1.4	4.2%	62.5%	1.4	3.1%	75.0%	2.7	3.6%	69.6%
50–54	0.0	0.0%	62.5%	2.7	6.3%	81.3%	2.7	3.6%	73.2%
55–59	2.7	8.3%	70.8%	1.4	3.1%	84.4%	4.1	5.4%	78.6%
60–64	4.1	12.5%	83.3%	4.1	9.4%	93.8%	8.2	10.7%	89.3%
65–69	4.1	12.5%	95.8%	1.4	3.1%	96.9%	5.5	7.1%	96.4%
70–74	0.0	0.0%	95.8%	0.0	0.0%	96.9%	0.0	0.0%	96.4%
75–79	0.0	0.0%	95.8%	1.4	3.1%	100.0%	1.4	1.8%	98.2%
80–84	0.0	0.0%	95.8%	0.0	0.0%	100.0%	0.0	0.0%	98.2%
85–89	0.0	0.0%	95.8%	0.0	0.0%	100.0%	0.0	0.0%	98.2%
90–94	0.0	0.0%	95.8%	0.0	0.0%	100.0%	0.0	0.0%	98.2%
95–99	0.0	0.0%	95.8%	0.0	0.0%	100.0%	0.0	0.0%	98.2%
100–104	0.0	0.0%	95.8%	0.0	0.0%	100.0%	0.0	0.0%	98.2%
Missing	1.4	4.2%	100.0%	0.0	0.0%	100.0%	1.4	1.8%	100.0%
Total	32.8	100.0%	100.0%	43.8	100.0%	100.0%	76.6	100.0%	100.0%

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

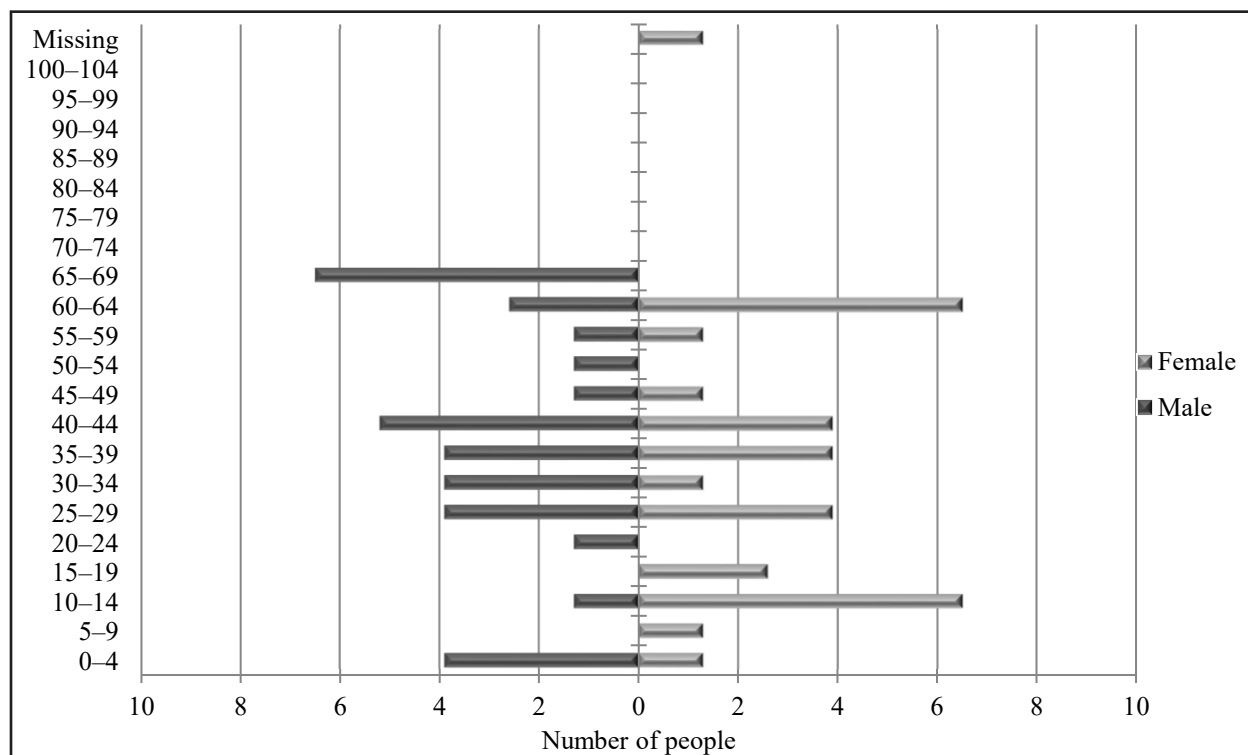


Figure 3-10.–Population profile, Chignik Lagoon, 2016.

Table 3-8.–Population profile, Chignik Lagoon, 2016.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0-4	3.9	10.7%	10.7%	1.3	3.7%	3.7%	5.2	7.3%	7.3%
5-9	0.0	0.0%	10.7%	1.3	3.7%	7.4%	1.3	1.8%	9.1%
10-14	1.3	3.6%	14.3%	6.5	18.5%	25.9%	7.8	10.9%	20.0%
15-19	0.0	0.0%	14.3%	2.6	7.4%	33.3%	2.6	3.6%	23.6%
20-24	1.3	3.6%	17.9%	0.0	0.0%	33.3%	1.3	1.8%	25.5%
25-29	3.9	10.7%	28.6%	3.9	11.1%	44.4%	7.8	10.9%	36.4%
30-34	3.9	10.7%	39.3%	1.3	3.7%	48.1%	5.2	7.3%	43.6%
35-39	3.9	10.7%	50.0%	3.9	11.1%	59.3%	7.8	10.9%	54.5%
40-44	5.2	14.3%	64.3%	3.9	11.1%	70.4%	9.1	12.7%	67.3%
45-49	1.3	3.6%	67.9%	1.3	3.7%	74.1%	2.6	3.6%	70.9%
50-54	1.3	3.6%	71.4%	0.0	0.0%	74.1%	1.3	1.8%	72.7%
55-59	1.3	3.6%	75.0%	1.3	3.7%	77.8%	2.6	3.6%	76.4%
60-64	2.6	7.1%	82.1%	6.5	18.5%	96.3%	9.1	12.7%	89.1%
65-69	6.5	17.9%	100.0%	0.0	0.0%	96.3%	6.5	9.1%	98.2%
70-74	0.0	0.0%	100.0%	0.0	0.0%	96.3%	0.0	0.0%	98.2%
75-79	0.0	0.0%	100.0%	0.0	0.0%	96.3%	0.0	0.0%	98.2%
80-84	0.0	0.0%	100.0%	0.0	0.0%	96.3%	0.0	0.0%	98.2%
85-89	0.0	0.0%	100.0%	0.0	0.0%	96.3%	0.0	0.0%	98.2%
90-94	0.0	0.0%	100.0%	0.0	0.0%	96.3%	0.0	0.0%	98.2%
95-99	0.0	0.0%	100.0%	0.0	0.0%	96.3%	0.0	0.0%	98.2%
100-104	0.0	0.0%	100.0%	0.0	0.0%	96.3%	0.0	0.0%	98.2%
Missing	0.0	0.0%	100.0%	1.3	3.7%	100.0%	1.3	1.8%	100.0%
Total	36.4	100.0%	100.0%	35.1	100.0%	100.0%	71.5	100.0%	100.0%

Source: ADF&G Division of Subsistence household surveys, 2017.

The U.S. Census Bureau and ADL estimates both show that Chignik Lagoon's population grew from the 1980s until it peaked at 103 in 2000 (U.S. Census Bureau) and 106 in 2001 (ADL) (Figure 3-7). The population declined through the beginning of the 2000s and has remained relatively stable since 2006. The ADL estimated Chignik Lagoon's population to be 73 people in 2014, 78 people in 2015, and 85 people in 2016, which is the highest ADL estimate since 2005. The ADL estimates from the first two study years were very similar to the estimates based on survey results; as mentioned in Chapter 1, there are several possible reasons for the difference in the estimates for 2016.

The study found that the ratio of males to females residing in Chignik Lagoon increased from 2014 to 2016. In 2014, there was a slightly lower estimated population of 30 males (42%) compared to 41 females (58%) (Figure 3-8; Table 3-6). In 2015, there were 33 males (43%) and 44 females (57%) (Figure 3-9; Table 3-7). Finally, the ratio of males to females residing in Chignik Lagoon in 2016 was close at 36 males (51%) to 35 females (49%) (Figure 3-10; Table 3-8). The population in all three years ranged from younger than 1 year old (in 2015 and 2016) to as old as 75 (in 2015) with the average age for all study years combined ranging 33–36 years old. (Table 3-5). The population in 2015 had the most children under age 10 (23% of population) (Table 3-7). There were more young adults aged 25–34 in Chignik Lagoon in 2016 compared to the earlier study years, yet more children ages 0–14 in 2015 compared to the year prior or later. The total estimated population in 2014 and 2016 were very similar, but the gender ratio differed, as did the population distribution among age cohorts. This fluctuation of ages between study years perhaps suggests that several families residing in Chignik Lagoon in 2014 moved away in 2015 and returned, or other families joined the community, in 2016.

The mean household size in all three study years stayed consistent with 2.8 people per household in 2014, 2.9 in 2015, and 2.8 in 2016 (Table 3-5). The average age of Chignik Lagoon residents in 2014 was 35 with the youngest resident being 1 year old, and the oldest was 66. In 2015, the mean age of residents was 33 years old with the youngest resident being less than 1, and the oldest resident was 75; and, in 2016, the mean age was 36 years old with the youngest being less than 1, and oldest was 69. The average length of residency by household heads was not asked in 2014, but in 2015 the mean was 33 years with the maximum being 65 years; then, in 2016, the mean was 31 years, with the maximum remaining 65 years.

Chignik Lake: 2014–2016

Chignik Lake's population fluctuates greatly from winter to summer because of the commercial and subsistence fishing opportunities, but, similar to the other Chignik communities, there is a core number of people who live in the community year-around and claim residency in Chignik Lake. The 2010 decennial census found that Chignik Lake had 27 occupied households with a total population of 73 people, of which 70 (96%) were Alaska Native (Figure 3-11; Table 3-9). The ACS five-year average total population estimate for 2010–2014 was 58 people, of which 53 (91%) were Alaska Native. ACS average population estimates for 2015 and 2016 were 70 and 71 people, respectively, with the highest Alaska Native population estimate occurring for 2012–2016 at 94%.

A survey of all Chignik Lake households was attempted, and sample achievement ranged 73%–97% of community households (Table 3-9). Based on the demographic data collected from surveyed households, survey results estimated that the total population in 2014, 2015, and 2016 was alike the estimates by the ACS and ADL in the same years. The study found the population stayed nearly the same in 2014 and 2015 but increased by 24% in 2016. For 2014, the survey estimated a total of 75 people residing in 26 households, of which 68 people (91% of population) identified themselves as Alaska Native. In 2015, the population was estimated to be 75 people residing in 29 households, of which 70 people (94% of population) identified themselves as Alaska Native. The third year of the study (2016), Chignik Lake's estimated population was 99 people residing in 33 households, of which 94 people (95% of population) identified themselves as Alaska Native.

The U.S. Census Bureau shows that Chignik Lake's population continued to grow by small increments from 1960 until 1980; ADL estimates show a peak population of 164 residents in 1985 (Figure 3-12). Though the population declined somewhat, it remained steady until 2000 when there was a total population of 145 (U.S. Census Bureau). Since that time, Chignik Lake's population has continued to decline. ADL estimates show

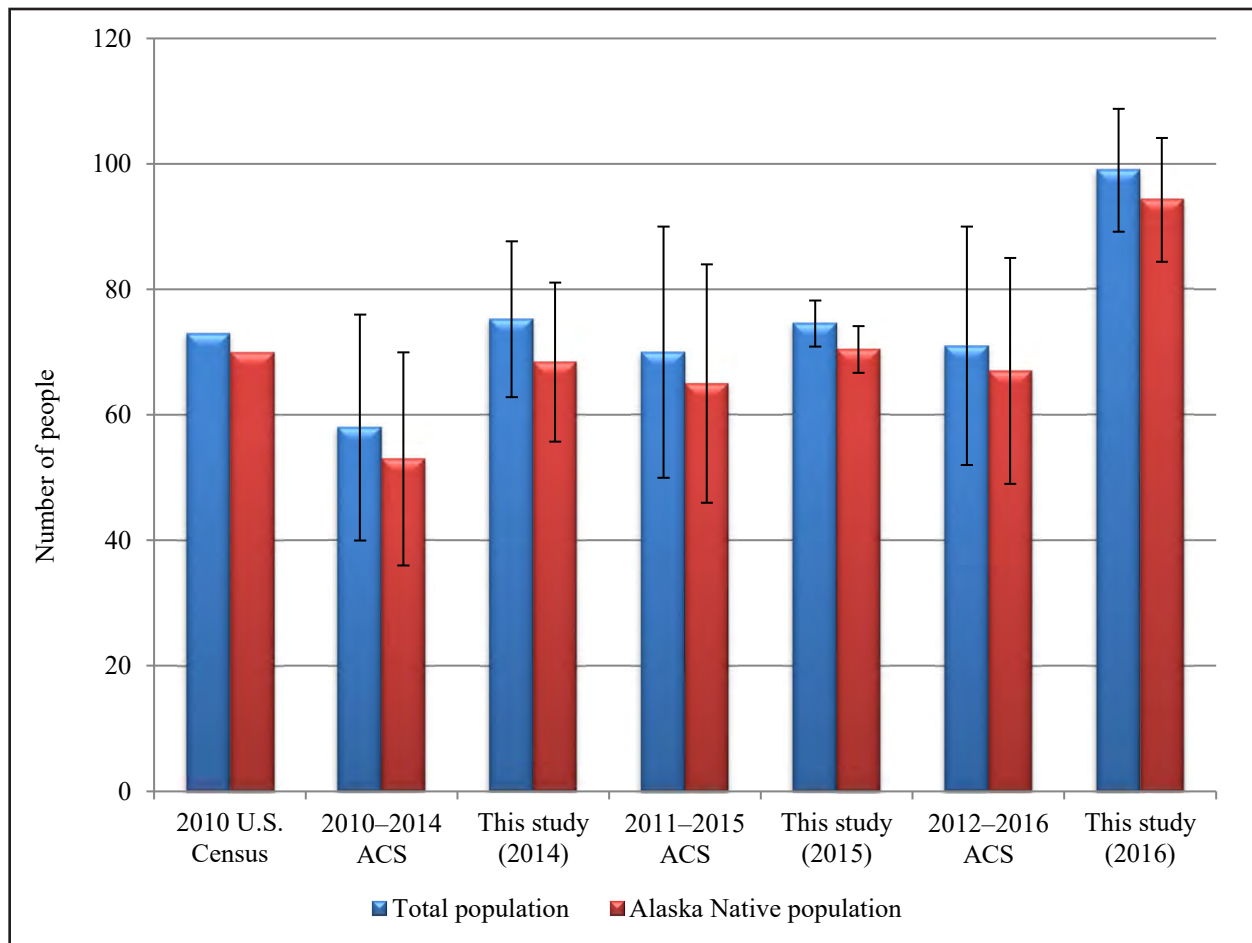


Figure 3-11.—Alaska Native and overall population estimates, Chignik Lake, 2010 and 2014–2016.

study years 2015 and 2016 with the lowest population on record (64 residents), but this study estimated a substantially higher 2016 population (99 people).

The study found that the ratio of males to females residing in Chignik Lake was highest in 2014, with an estimated 41 males (55%) and 34 females (45%) (Figure 3-13; Table 3-10). In 2015 and 2016, the ratio of males to females was both identical and equal between the genders. In 2015, there was an estimated 37 males (50%) and 37 females (50%) (Figure 3-14; Table 3-11). In 2016, there was an estimated 50 males (50%) and 50 females (50%) (Figure 3-15; Table 3-12). In all study years combined, the population by age ranged from as low as younger than 1 year old to as high as 95 (in 2015) (Table 3-9). The population in 2014 exhibited the largest total population for the age cohorts 15–19 and 50–54: each cohort represented 20% of the 2014 total population (Table 3-10). Study year 2016 had the strongest component of the population ranging from younger than 1 to adults age 39 (71% of 2016 population); by comparison, 58% and 65% of the population in 2014 and 2015, respectively, was aged 0–39.

The mean household size in all three study years stayed consistent with an estimated 2.9 people per household in 2014, 2.6 in 2015, and 3.0 in 2016 (Table 3-9). The average age of Chignik Lake residents in 2014 was 33 with the youngest resident being 1 year old, and the oldest was 74. In 2015, the mean age was 33 with the youngest resident being younger than 1 year old, and the oldest was 95; and, in 2016, the mean age decreased again to 29 years old with the youngest resident being younger than 1 year old, and the oldest was 78. The average length of residency by household heads was not asked in 2014, but in 2015 the mean was 40 years with the maximum being 87 years; then, in 2016, the mean length of residency lowered to 34 years, with the maximum being 68 years.

Table 3-9.—Sample and demographic characteristics, Chignik Lake, 2010 and 2014–2016.

Characteristics	Chignik Lake		
	2014	2015	2016
Sampled households	19	28	28
Eligible households	26	29	33
Percentage sampled	73.1%	96.6%	84.8%
Sampled population	55	72	84
Estimated community population	75.3	74.6	99.0
Range ^a	63 – 88	71 – 78	89 – 109
Household size			
Mean	2.9	2.6	3.0
Minimum	1	1	1
Maximum	7	7	8
Age			
Mean	33.2	32.7	29.2
Minimum ^b	1	0	0
Maximum	74	95	78
Median	33	27	24
Length of residency^c			
Total population			
Mean		28.8	21.6
Minimum ^b		0	0
Maximum		87	68
Heads of household			
Mean		40.4	33.5
Minimum ^b		3	1
Maximum		87	68
Alaska Native			
Estimated households ^d			
Number	23.3	25.9	29.5
Percentage	89.5%	89.3%	89.3%
Estimated population			
Number	68.4	70.4	94.3
Percentage	90.9%	94.4%	95.2%
Range ^a	56 – 81	67 – 74	84 – 104
U.S. Census 2010^e			
Households	27	27	27
Population	73	73	73
Alaska Native population	70	70	70

-continued-

Table 3-9.—Page 2 of 2.

Characteristics	Chignik Lake		
	2014	2015	2016
American Community Survey			
5-year average^e			
Population	58	70	71
Range ^f	40 – 76	50 – 90	49 – 85
Alaska Native population	53	65	67
Range ^f	36 – 70	46 – 84	49 – 85

Source ADF&G Division of Subsistence household surveys, 2015–2017.

a. Estimated range is 95% confidence interval.

b. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.

c. Length of residency not asked for 2014 surveys.

d. The estimated number of households in which at least one head of household is Alaska Native.

e. Source is U.S. Census Bureau (n.d.) for 2010 decennial census data, and for American Community Survey (ACS) five-year estimates for 2014 (2010–2014), 2015 (2011–2015), and 2016 (2012–2016).

f. ACS data range is the reported margin of error.

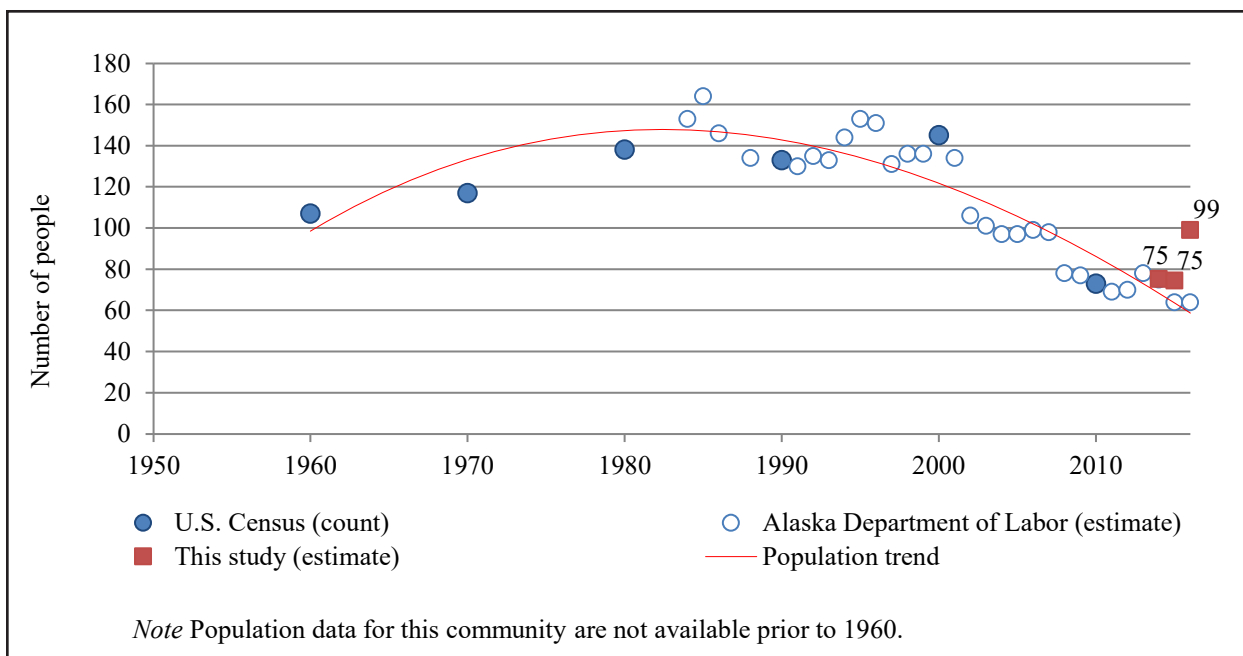


Figure 3-12.—Historical population estimates, Chignik Lake, 1960–2016.

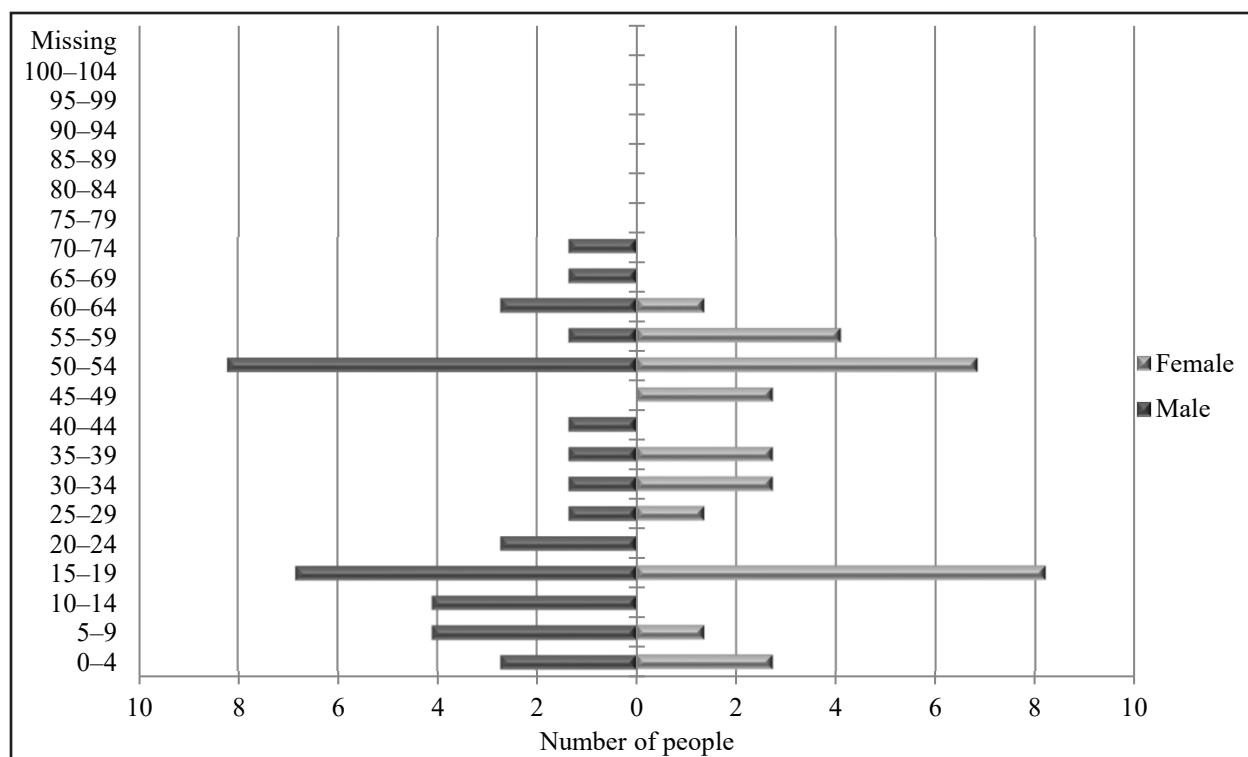


Figure 3-13.—Population profile, Chignik Lake, 2014.

Table 3-10.—Population profile, Chignik Lake, 2014.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0-4	2.7	6.7%	6.7%	2.7	8.0%	8.0%	5.5	7.3%	7.3%
5-9	4.1	10.0%	16.7%	1.4	4.0%	12.0%	5.5	7.3%	14.5%
10-14	4.1	10.0%	26.7%	0.0	0.0%	12.0%	4.1	5.5%	20.0%
15-19	6.8	16.7%	43.3%	8.2	24.0%	36.0%	15.1	20.0%	40.0%
20-24	2.7	6.7%	50.0%	0.0	0.0%	36.0%	2.7	3.6%	43.6%
25-29	1.4	3.3%	53.3%	1.4	4.0%	40.0%	2.7	3.6%	47.3%
30-34	1.4	3.3%	56.7%	2.7	8.0%	48.0%	4.1	5.5%	52.7%
35-39	1.4	3.3%	60.0%	2.7	8.0%	56.0%	4.1	5.5%	58.2%
40-44	1.4	3.3%	63.3%	0.0	0.0%	56.0%	1.4	1.8%	60.0%
45-49	0.0	0.0%	63.3%	2.7	8.0%	64.0%	2.7	3.6%	63.6%
50-54	8.2	20.0%	83.3%	6.8	20.0%	84.0%	15.1	20.0%	83.6%
55-59	1.4	3.3%	86.7%	4.1	12.0%	96.0%	5.5	7.3%	90.9%
60-64	2.7	6.7%	93.3%	1.4	4.0%	100.0%	4.1	5.5%	96.4%
65-69	1.4	3.3%	96.7%	0.0	0.0%	100.0%	1.4	1.8%	98.2%
70-74	1.4	3.3%	100.0%	0.0	0.0%	100.0%	1.4	1.8%	100.0%
75-79	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
80-84	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
85-89	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
90-94	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
95-99	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
100-104	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Missing	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Total	41.1	100.0%	100.0%	34.2	100.0%	100.0%	75.3	100.0%	100.0%

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

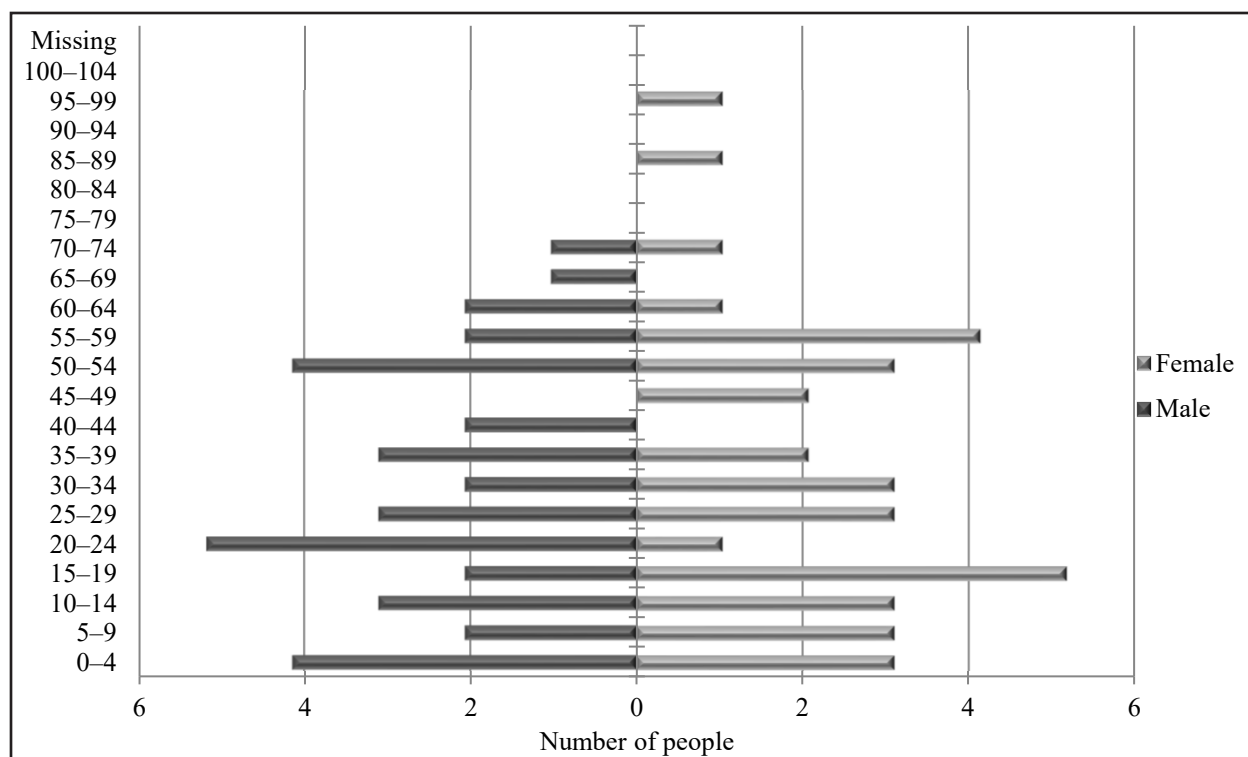


Figure 3-14.—Population profile, Chignik Lake, 2015.

Table 3-11.—Population profile, Chignik Lake, 2015.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0-4	4.1	11.1%	11.1%	3.1	8.3%	8.3%	7.3	9.7%	9.7%
5-9	2.1	5.6%	16.7%	3.1	8.3%	16.7%	5.2	6.9%	16.7%
10-14	3.1	8.3%	25.0%	3.1	8.3%	25.0%	6.2	8.3%	25.0%
15-19	2.1	5.6%	30.6%	5.2	13.9%	38.9%	7.3	9.7%	34.7%
20-24	5.2	13.9%	44.4%	1.0	2.8%	41.7%	6.2	8.3%	43.1%
25-29	3.1	8.3%	52.8%	3.1	8.3%	50.0%	6.2	8.3%	51.4%
30-34	2.1	5.6%	58.3%	3.1	8.3%	58.3%	5.2	6.9%	58.3%
35-39	3.1	8.3%	66.7%	2.1	5.6%	63.9%	5.2	6.9%	65.3%
40-44	2.1	5.6%	72.2%	0.0	0.0%	63.9%	2.1	2.8%	68.1%
45-49	0.0	0.0%	72.2%	2.1	5.6%	69.4%	2.1	2.8%	70.8%
50-54	4.1	11.1%	83.3%	3.1	8.3%	77.8%	7.3	9.7%	80.6%
55-59	2.1	5.6%	88.9%	4.1	11.1%	88.9%	6.2	8.3%	88.9%
60-64	2.1	5.6%	94.4%	1.0	2.8%	91.7%	3.1	4.2%	93.1%
65-69	1.0	2.8%	97.2%	0.0	0.0%	91.7%	1.0	1.4%	94.4%
70-74	1.0	2.8%	100.0%	1.0	2.8%	94.4%	2.1	2.8%	97.2%
75-79	0.0	0.0%	100.0%	0.0	0.0%	94.4%	0.0	0.0%	97.2%
80-84	0.0	0.0%	100.0%	0.0	0.0%	94.4%	0.0	0.0%	97.2%
85-89	0.0	0.0%	100.0%	1.0	2.8%	97.2%	1.0	1.4%	98.6%
90-94	0.0	0.0%	100.0%	0.0	0.0%	97.2%	0.0	0.0%	98.6%
95-99	0.0	0.0%	100.0%	1.0	2.8%	100.0%	1.0	1.4%	100.0%
100-104	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Missing	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Total	37.3	100.0%	100.0%	37.3	100.0%	100.0%	74.6	100.0%	100.0%

Source: ADF&G Division of Subsistence household surveys, 2016.

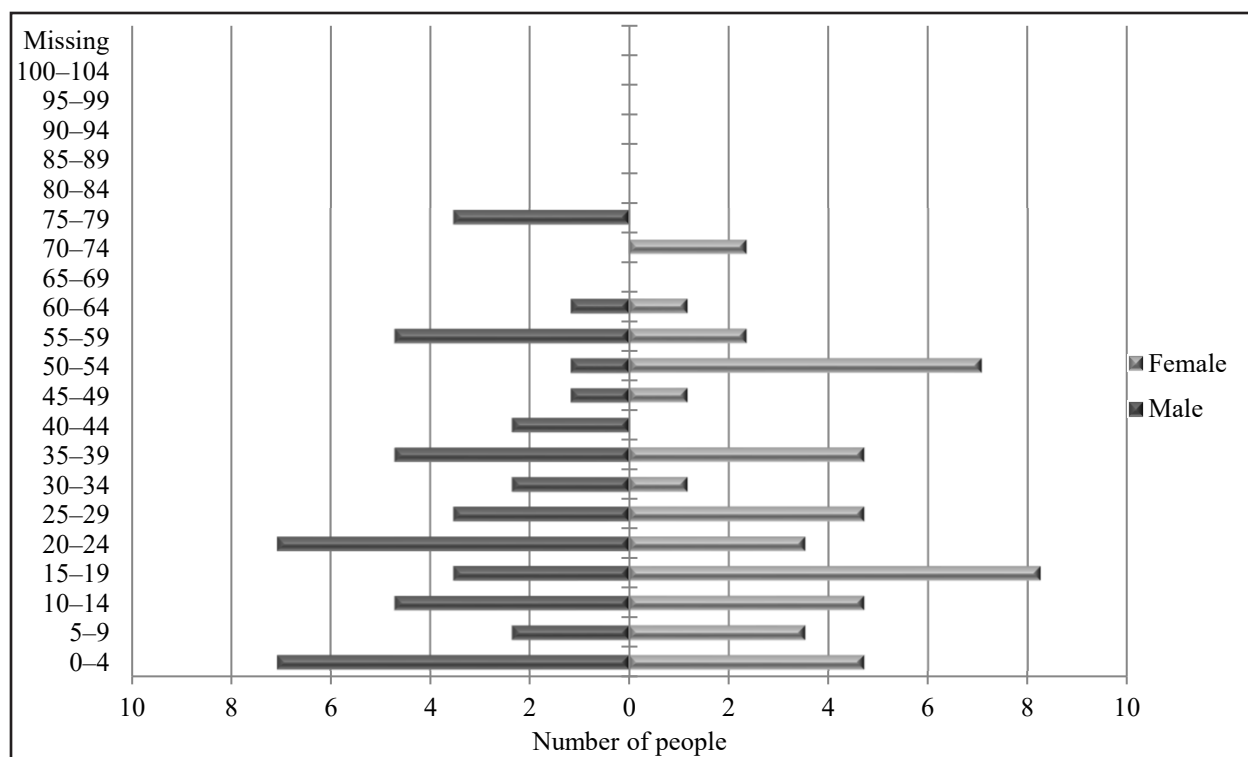


Figure 3-15.–Population profile, Chignik Lake, 2016.

Table 3-12.–Population profile, Chignik Lake, 2016.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0-4	7.1	14.3%	14.3%	4.7	9.5%	9.5%	11.8	11.9%	11.9%
5-9	2.4	4.8%	19.0%	3.5	7.1%	16.7%	5.9	6.0%	17.9%
10-14	4.7	9.5%	28.6%	4.7	9.5%	26.2%	9.4	9.5%	27.4%
15-19	3.5	7.1%	35.7%	8.3	16.7%	42.9%	11.8	11.9%	39.3%
20-24	7.1	14.3%	50.0%	3.5	7.1%	50.0%	10.6	10.7%	50.0%
25-29	3.5	7.1%	57.1%	4.7	9.5%	59.5%	8.3	8.3%	58.3%
30-34	2.4	4.8%	61.9%	1.2	2.4%	61.9%	3.5	3.6%	61.9%
35-39	4.7	9.5%	71.4%	4.7	9.5%	71.4%	9.4	9.5%	71.4%
40-44	2.4	4.8%	76.2%	0.0	0.0%	71.4%	2.4	2.4%	73.8%
45-49	1.2	2.4%	78.6%	1.2	2.4%	73.8%	2.4	2.4%	76.2%
50-54	1.2	2.4%	81.0%	7.1	14.3%	88.1%	8.3	8.3%	84.5%
55-59	4.7	9.5%	90.5%	2.4	4.8%	92.9%	7.1	7.1%	91.7%
60-64	1.2	2.4%	92.9%	1.2	2.4%	95.2%	2.4	2.4%	94.0%
65-69	0.0	0.0%	92.9%	0.0	0.0%	95.2%	0.0	0.0%	94.0%
70-74	0.0	0.0%	92.9%	2.4	4.8%	100.0%	2.4	2.4%	96.4%
75-79	3.5	7.1%	100.0%	0.0	0.0%	100.0%	3.5	3.6%	100.0%
80-84	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
85-89	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
90-94	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
95-99	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
100-104	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Missing	0.0	0.0%	100.0%	0.0	0.0%	100.0%	0.0	0.0%	100.0%
Total	49.5	100.0%	100.0%	49.5	100.0%	100.0%	99.0	100.0%	100.0%

Source ADF&G Division of Subsistence household surveys, 2017.

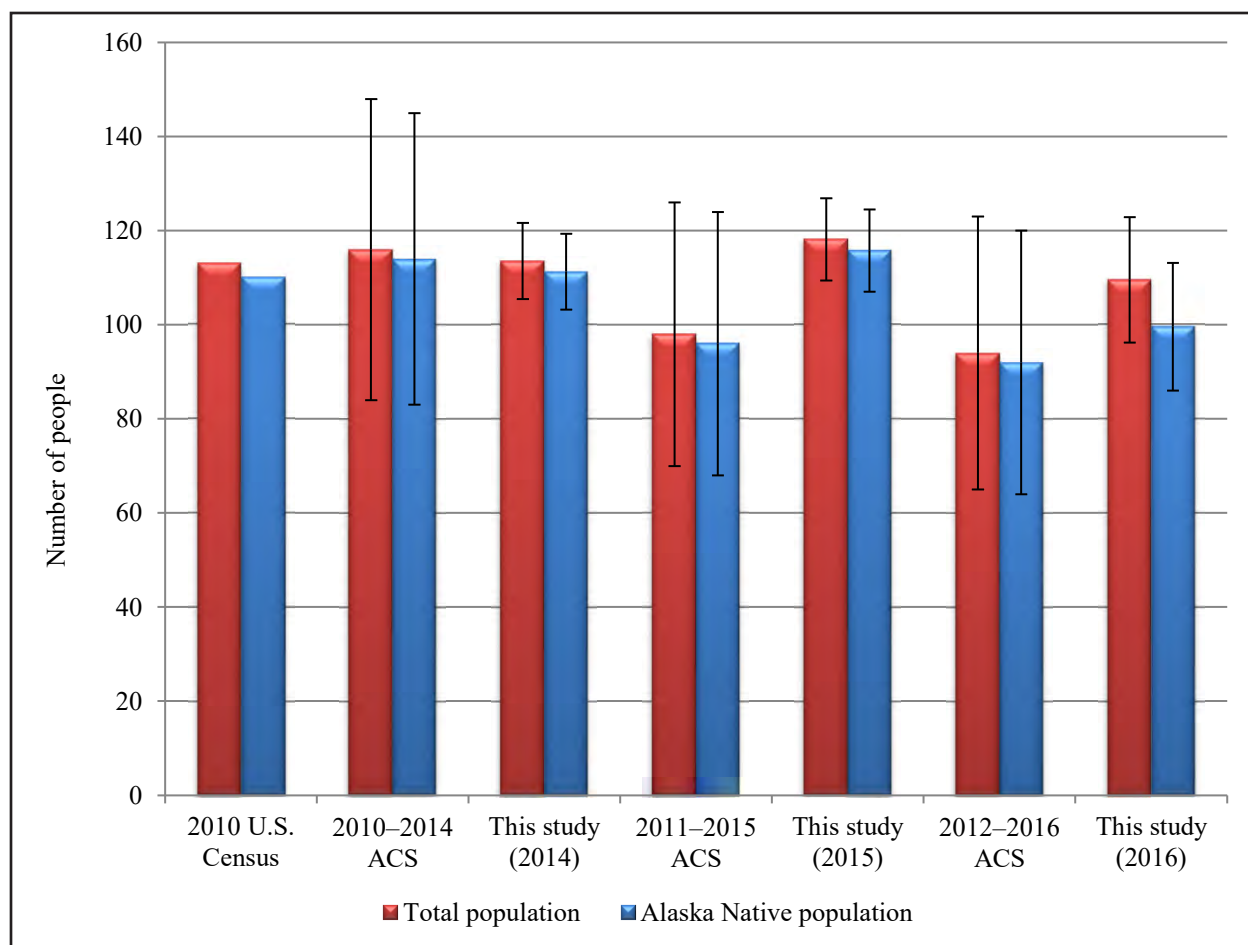


Figure 3-16.—Alaska Native and overall population estimates, Perryville, 2010 and 2014–2016.

Perryville: 2014–2016

According to the 2010 decennial census, Perryville’s population was 113 people residing in 38 households (Figure 3-16; Table 3-13). A large majority of the population—110 people (97%)—was Alaska Native. The ACS five-year average total population estimate for 2010–2014 was 116 people, of which 114 (98%) were Alaska Native. For the later study years, the ACS average estimates were less than for 2014, but 98% of the community was Alaska Native; the average estimates were 98 people for 2011–2015, and 94 people for 2012–2016.

A survey of all Perryville households was attempted, and sample achievement ranged 70%–87% of households (Table 3-13). Based on the demographic data collected from surveyed households, survey results estimated a total population in 2014 of 114 people residing in 39 households, of which 111 people (98% of population) identified themselves as Alaska Native households. In 2015, the population was estimated to be 118 people residing in 39 households, of which 116 people (98% of population) identified themselves as Alaska Native. The third year of the study (2016), Perryville’s estimated population was 110 people residing in 37 households, of which 100 people (91% of population) identified themselves as Alaska Native.

The first census for Perryville was taken in 1920 and reported a population of 85.¹⁵ The population increased after 1920, and, since 1960, the population has remained relatively stable (Figure 3-17). Perryville is the

15. ADLWD (Alaska Department of Labor and Workforce Development) Research and Analysis Section. 2019. “1880 to 2000 Census data: 1920 Census, population of outlying possessions by minor civil divisions.” <http://live>.

only community in the CMA that has maintained its population for the last 50 years. Due to the community's geographic isolation, the community has maintained strong leadership, successfully implemented innovative ideas, and developed a strong sense of self-reliance and independence.¹⁶ There are a few residents who commercial fish, but because the CMA commercial fishery is centered around the Chignik watershed, Perryville does not see the influx of seasonal residents and fishermen that the communities of Chignik experience. The ADL estimated Perryville's 2014 population to be 101 people. In 2015 and 2016, ADL estimated Perryville's total population to be 111 and 110 people, respectively.

The study found that the ratio of males to females residing in Perryville declined from 2014 to 2016. In 2014, there was an estimated 57 males (51%) and 56 females (49%) (Figure 3-18; Table 3-14). In 2015, there was an estimated equal number of people (59) from each gender (Figure 3-19; Table 3-15). In 2016, there was an estimated 47 males (43%) and 63 females (57%) (Figure 3-20; Table 3-16). The population in all three years ranged from younger than 1 year old to the oldest person ranging 91–93 years old (Table 3-13). In each year, the majority of the population was younger than 35: 61%–65% of the population. The most populated age cohorts by study year were generally for youths: 10–14 in 2014 (12% of population), 0–4 and 10–14 in 2015 (each 12% of population), and 0–4 in 2016 (13% of population).

The mean household size in all three study years stayed consistent with 2.9 people per household in 2014 and 3.0 people per household in both 2015 and 2016 (Table 3-13). The average age of Perryville residents throughout the three study years remained at 29 or 30 years old. In each year, Perryville had at least one resident younger than 1 year old, and the oldest resident was older than 90. The average length of residency by household heads was not asked in 2014, but in 2015 the mean was 34 years with the maximum being 92 years; then, in 2016, the mean length of residency reduced to 32 years, with the maximum being 93 years.

laborstats.alaska.gov/cen/hist.cfm (accessed September 2019).

16. Lake and Peninsula Borough. 2012. "Lake and Peninsula Borough Comprehensive Plan: Perryville Community Action Plan." <http://www.lakeandpen.com/common/pages/DisplayFile.aspx?itemId=1577079> (accessed November 2019).

Table 3-13.—Sample and demographic characteristics, Perryville, 2010 and 2014–2016.

Characteristics	Perryville		
	2014	2015	2016
Sampled households	34	33	26
Eligible households	39	39	37
Percentage sampled	87.2%	84.6%	70.3%
Sampled population	99	100	77
Estimated community population	113.6	118.2	109.6
Range ^a	105 – 122	109 – 127	96 – 123
Household size			
Mean	2.9	3.0	3.0
Minimum	1	1	1
Maximum	7	7	7
Age			
Mean	29.4	30.5	29.2
Minimum ^b	0	0	0
Maximum	91	92	93
Median	24.5	26.5	28
Length of residency^c			
Total population			
Mean		23.0	22.8
Minimum ^b		0	0
Maximum		92	93
Heads of household			
Mean		34.2	31.7
Minimum ^b		3	1
Maximum		92	93
Alaska Native			
Estimated households ^d			
Number	39.0	37.8	32.7
Percentage	100.0%	97.0%	88.5%
Estimated population			
Number	111.3	115.8	99.6
Percentage	98.0%	98.0%	90.9%
Range ^a	103 – 119	107 – 125	86 – 113
U.S. Census 2010^e			
Households	38	38	38
Population	113	113	113
Alaska Native population	110	110	110

-continued-

Table 3-13.—Page 2 of 2.

Characteristics	Perryville		
	2014	2015	2016
American Community Survey			
5-year average^e			
Population	116	98	94
Range ^f	84 – 148	70 – 126	64 – 120
Alaska Native population	114	96	92
Range ^f	83 – 145	68 – 124	64 – 120

Source ADF&G Division of Subsistence household surveys, 2015–2017.

a. Estimated range is 95% confidence interval.

b. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.

c. Length of residency not asked for 2014 surveys.

d. The estimated number of households in which at least one head of household is Alaska Native.

e. Source is U.S. Census Bureau (n.d.) for 2010 decennial census data, and for American Community Survey (ACS) five-year estimates for 2014 (2010–2014), 2015 (2011–2015), and 2016 (2012–2016).

f. ACS data range is the reported margin of error.

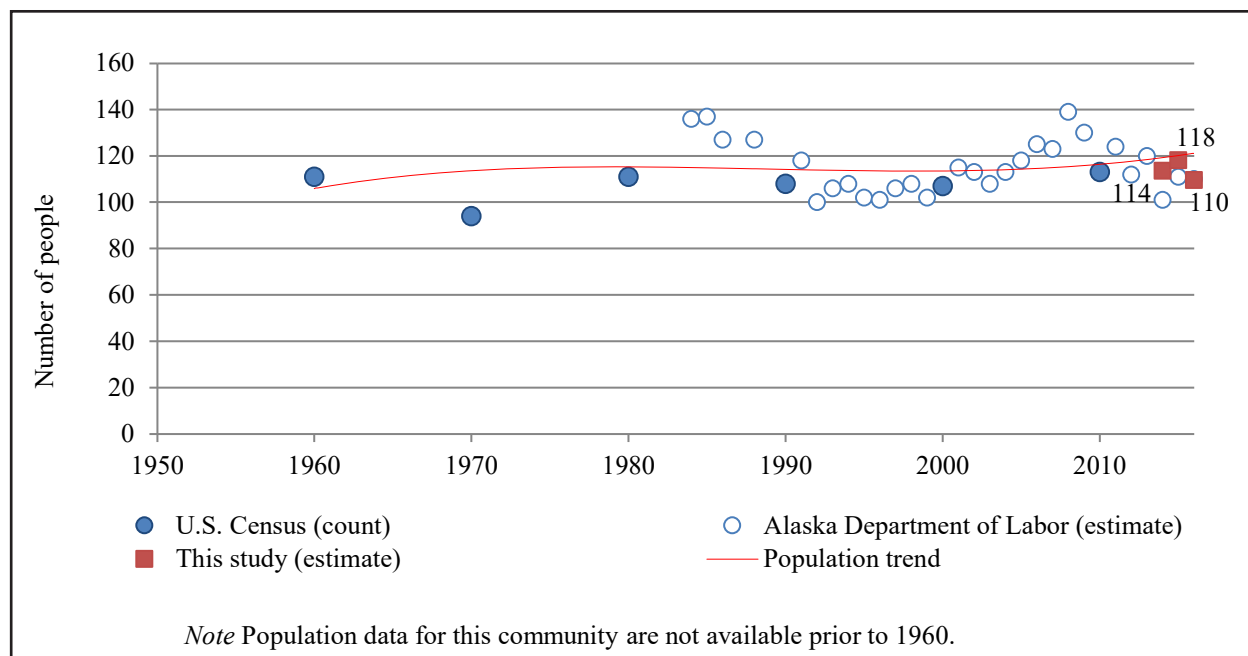


Figure 3-17.—Historical population estimates, Perryville, 1960–2016.

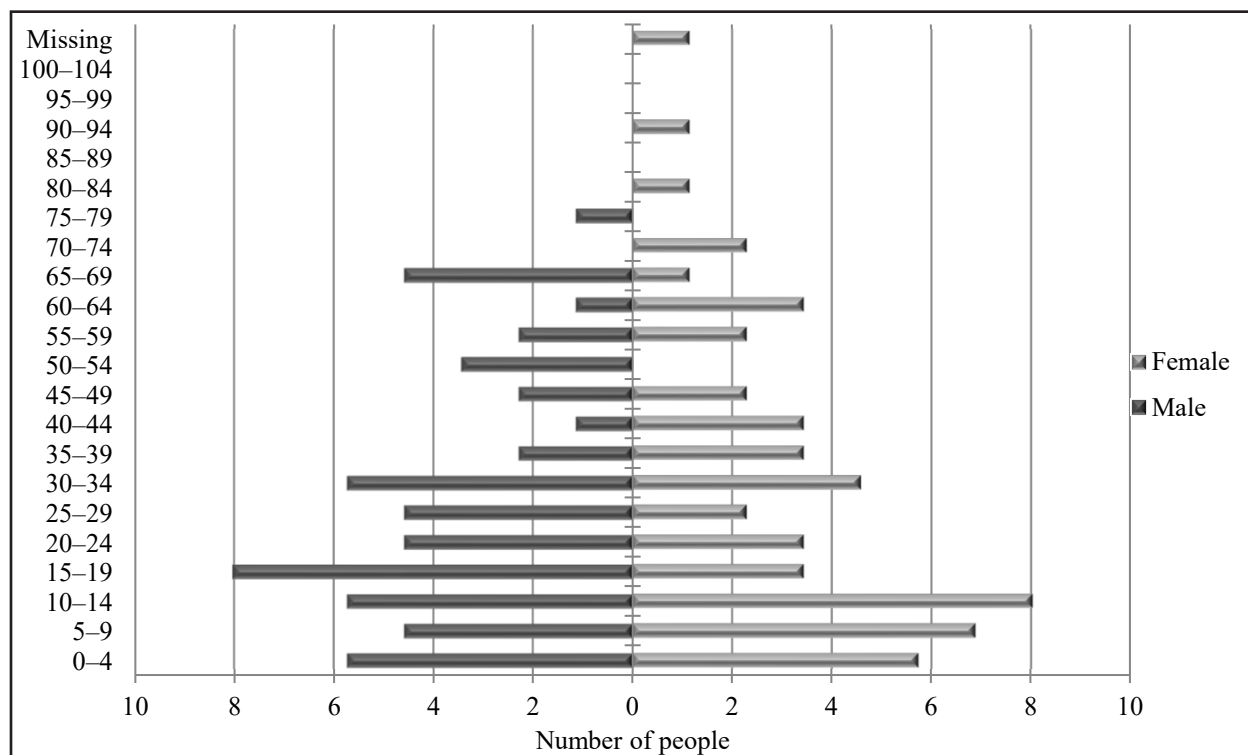


Figure 3-18.–Population profile, Perryville, 2014.

Table 3-14.–Population profile, Perryville, 2014.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	5.7	10.0%	10.0%	5.7	10.2%	10.2%	11.5	10.1%	10.1%
5–9	4.6	8.0%	18.0%	6.9	12.2%	22.4%	11.5	10.1%	20.2%
10–14	5.7	10.0%	28.0%	8.0	14.3%	36.7%	13.8	12.1%	32.3%
15–19	8.0	14.0%	42.0%	3.4	6.1%	42.9%	11.5	10.1%	42.4%
20–24	4.6	8.0%	50.0%	3.4	6.1%	49.0%	8.0	7.1%	49.5%
25–29	4.6	8.0%	58.0%	2.3	4.1%	53.1%	6.9	6.1%	55.6%
30–34	5.7	10.0%	68.0%	4.6	8.2%	61.2%	10.3	9.1%	64.6%
35–39	2.3	4.0%	72.0%	3.4	6.1%	67.3%	5.7	5.1%	69.7%
40–44	1.1	2.0%	74.0%	3.4	6.1%	73.5%	4.6	4.0%	73.7%
45–49	2.3	4.0%	78.0%	2.3	4.1%	77.6%	4.6	4.0%	77.8%
50–54	3.4	6.0%	84.0%	0.0	0.0%	77.6%	3.4	3.0%	80.8%
55–59	2.3	4.0%	88.0%	2.3	4.1%	81.6%	4.6	4.0%	84.8%
60–64	1.1	2.0%	90.0%	3.4	6.1%	87.8%	4.6	4.0%	88.9%
65–69	4.6	8.0%	98.0%	1.1	2.0%	89.8%	5.7	5.1%	93.9%
70–74	0.0	0.0%	98.0%	2.3	4.1%	93.9%	2.3	2.0%	96.0%
75–79	1.1	2.0%	100.0%	0.0	0.0%	93.9%	1.1	1.0%	97.0%
80–84	0.0	0.0%	100.0%	1.1	2.0%	95.9%	1.1	1.0%	98.0%
85–89	0.0	0.0%	100.0%	0.0	0.0%	95.9%	0.0	0.0%	98.0%
90–94	0.0	0.0%	100.0%	1.1	2.0%	98.0%	1.1	1.0%	99.0%
95–99	0.0	0.0%	100.0%	0.0	0.0%	98.0%	0.0	0.0%	99.0%
100–104	0.0	0.0%	100.0%	0.0	0.0%	98.0%	0.0	0.0%	99.0%
Missing	0.0	0.0%	100.0%	1.1	2.0%	100.0%	1.1	1.0%	100.0%
Total	57.4	100.0%	100.0%	56.2	100.0%	100.0%	113.6	100.0%	100.0%

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

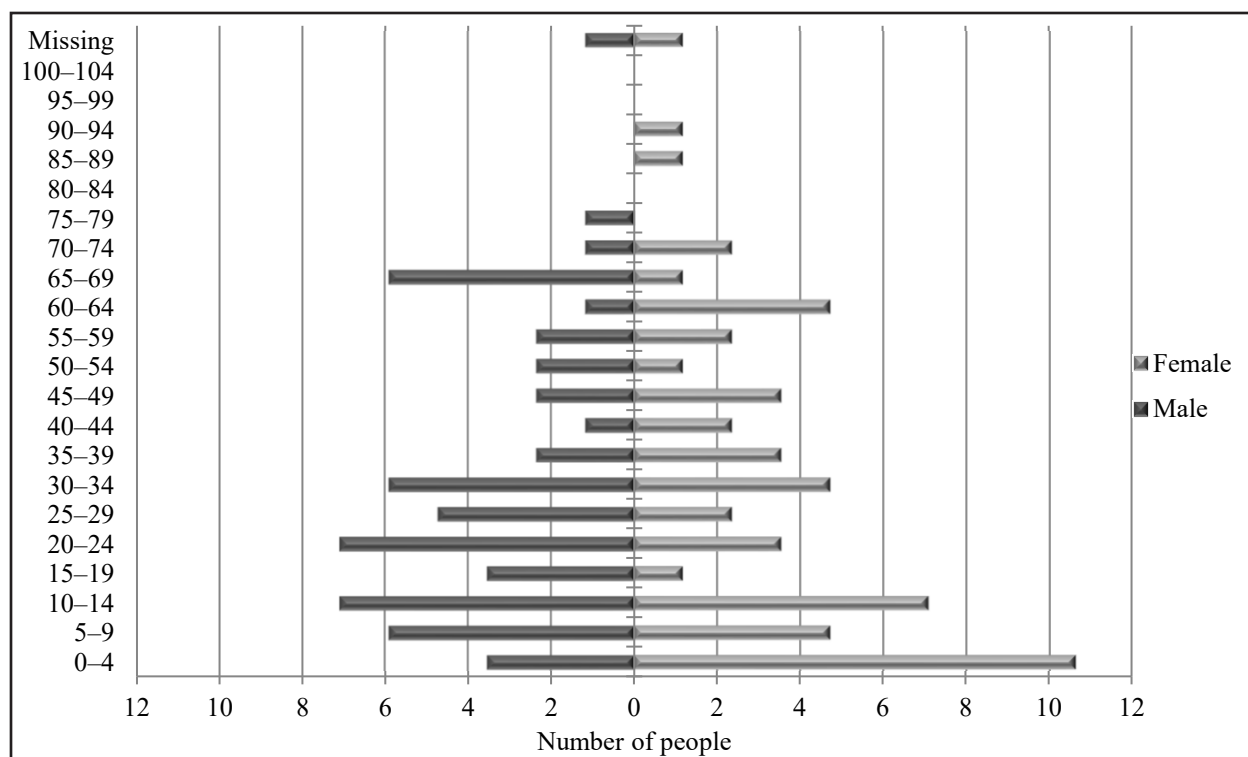


Figure 3-19.—Population profile, Perryville, 2015.

Table 3-15.—Population profile, Perryville, 2015.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0-4	3.5	6.0%	6.0%	10.6	18.0%	18.0%	14.2	12.0%	12.0%
5-9	5.9	10.0%	16.0%	4.7	8.0%	26.0%	10.6	9.0%	21.0%
10-14	7.1	12.0%	28.0%	7.1	12.0%	38.0%	14.2	12.0%	33.0%
15-19	3.5	6.0%	34.0%	1.2	2.0%	40.0%	4.7	4.0%	37.0%
20-24	7.1	12.0%	46.0%	3.5	6.0%	46.0%	10.6	9.0%	46.0%
25-29	4.7	8.0%	54.0%	2.4	4.0%	50.0%	7.1	6.0%	52.0%
30-34	5.9	10.0%	64.0%	4.7	8.0%	58.0%	10.6	9.0%	61.0%
35-39	2.4	4.0%	68.0%	3.5	6.0%	64.0%	5.9	5.0%	66.0%
40-44	1.2	2.0%	70.0%	2.4	4.0%	68.0%	3.5	3.0%	69.0%
45-49	2.4	4.0%	74.0%	3.5	6.0%	74.0%	5.9	5.0%	74.0%
50-54	2.4	4.0%	78.0%	1.2	2.0%	76.0%	3.5	3.0%	77.0%
55-59	2.4	4.0%	82.0%	2.4	4.0%	80.0%	4.7	4.0%	81.0%
60-64	1.2	2.0%	84.0%	4.7	8.0%	88.0%	5.9	5.0%	86.0%
65-69	5.9	10.0%	94.0%	1.2	2.0%	90.0%	7.1	6.0%	92.0%
70-74	1.2	2.0%	96.0%	2.4	4.0%	94.0%	3.5	3.0%	95.0%
75-79	1.2	2.0%	98.0%	0.0	0.0%	94.0%	1.2	1.0%	96.0%
80-84	0.0	0.0%	98.0%	0.0	0.0%	94.0%	0.0	0.0%	96.0%
85-89	0.0	0.0%	98.0%	1.2	2.0%	96.0%	1.2	1.0%	97.0%
90-94	0.0	0.0%	98.0%	1.2	2.0%	98.0%	1.2	1.0%	98.0%
95-99	0.0	0.0%	98.0%	0.0	0.0%	98.0%	0.0	0.0%	98.0%
100-104	0.0	0.0%	98.0%	0.0	0.0%	98.0%	0.0	0.0%	98.0%
Missing	1.2	2.0%	100.0%	1.2	2.0%	100.0%	2.4	2.0%	100.0%
Total	59.1	100.0%	100.0%	59.1	100.0%	100.0%	118.2	100.0%	100.0%

Source: ADF&G Division of Subsistence household surveys, 2016.

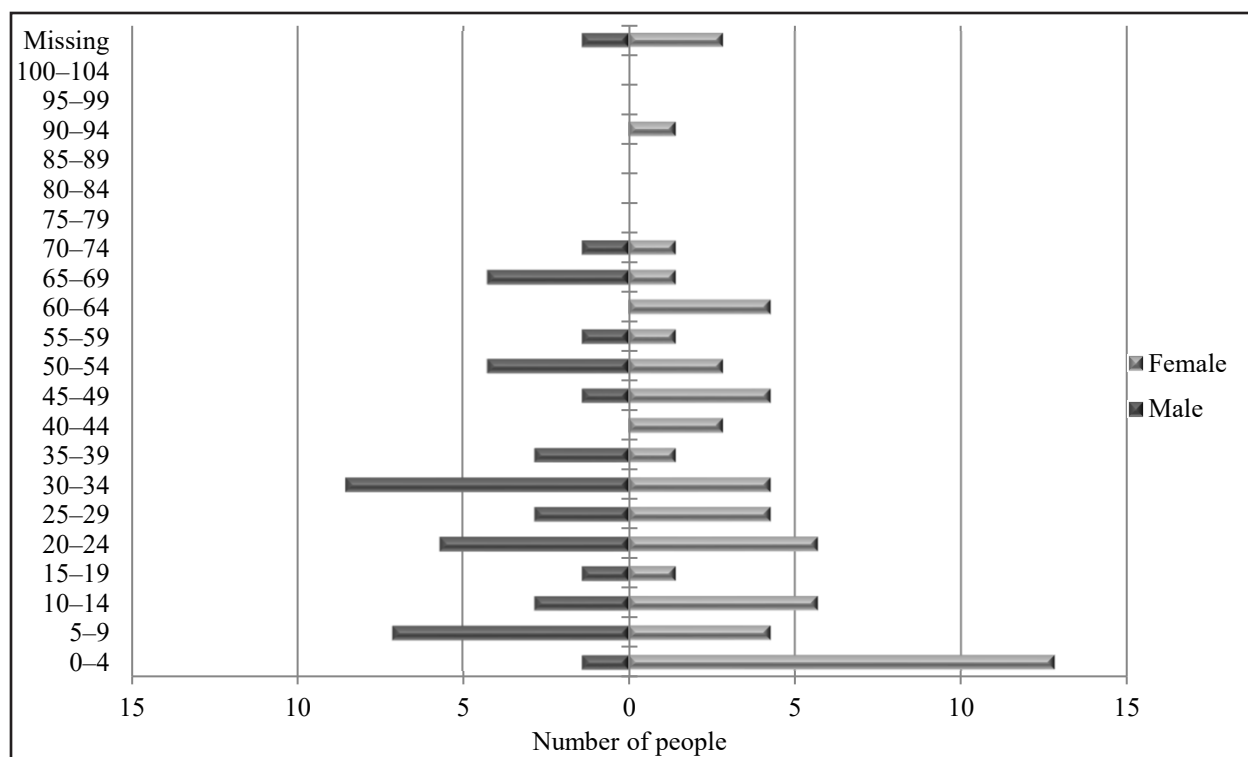


Figure 3-20.–Population profile, Perryville, 2016.

Table 3-16.–Population profile, Perryville, 2016.

Age	Male			Female			Total		
	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0-4	1.4	3.0%	3.0%	12.8	20.5%	20.5%	14.2	13.0%	13.0%
5-9	7.1	15.2%	18.2%	4.3	6.8%	27.3%	11.4	10.4%	23.4%
10-14	2.8	6.1%	24.2%	5.7	9.1%	36.4%	8.5	7.8%	31.2%
15-19	1.4	3.0%	27.3%	1.4	2.3%	38.6%	2.8	2.6%	33.8%
20-24	5.7	12.1%	39.4%	5.7	9.1%	47.7%	11.4	10.4%	44.2%
25-29	2.8	6.1%	45.5%	4.3	6.8%	54.5%	7.1	6.5%	50.6%
30-34	8.5	18.2%	63.6%	4.3	6.8%	61.4%	12.8	11.7%	62.3%
35-39	2.8	6.1%	69.7%	1.4	2.3%	63.6%	4.3	3.9%	66.2%
40-44	0.0	0.0%	69.7%	2.8	4.5%	68.2%	2.8	2.6%	68.8%
45-49	1.4	3.0%	72.7%	4.3	6.8%	75.0%	5.7	5.2%	74.0%
50-54	4.3	9.1%	81.8%	2.8	4.5%	79.5%	7.1	6.5%	80.5%
55-59	1.4	3.0%	84.8%	1.4	2.3%	81.8%	2.8	2.6%	83.1%
60-64	0.0	0.0%	84.8%	4.3	6.8%	88.6%	4.3	3.9%	87.0%
65-69	4.3	9.1%	93.9%	1.4	2.3%	90.9%	5.7	5.2%	92.2%
70-74	1.4	3.0%	97.0%	1.4	2.3%	93.2%	2.8	2.6%	94.8%
75-79	0.0	0.0%	97.0%	0.0	0.0%	93.2%	0.0	0.0%	94.8%
80-84	0.0	0.0%	97.0%	0.0	0.0%	93.2%	0.0	0.0%	94.8%
85-89	0.0	0.0%	97.0%	0.0	0.0%	93.2%	0.0	0.0%	94.8%
90-94	0.0	0.0%	97.0%	1.4	2.3%	95.5%	1.4	1.3%	96.1%
95-99	0.0	0.0%	97.0%	0.0	0.0%	95.5%	0.0	0.0%	96.1%
100-104	0.0	0.0%	97.0%	0.0	0.0%	95.5%	0.0	0.0%	96.1%
Missing	1.4	3.0%	100.0%	2.8	4.5%	100.0%	4.3	3.9%	100.0%
Total	47.0	100.0%	100.0%	62.6	100.0%	100.0%	109.6	100.0%	100.0%

Source ADF&G Division of Subsistence household surveys, 2017.

HOUSEHOLD SALMON HARVEST AND USE CHARACTERISTICS

The study communities of Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville are all located within the boundaries of the Chignik Area that is used for managing both commercial and subsistence salmon fisheries (see 5 AAC 15.100 or 5 AAC 01.450 for a description of the management area). There are five species of Pacific salmon that are harvested and used for subsistence in the CMA by local residents and non-local residents of Alaska: Chinook *Oncorhynchus tshawytscha*, sockeye *O. nerka*, coho *O. kisutch*, pink *O. gorbuscha*, and chum *O. keta* salmon. Sockeye salmon is the most abundant, most targeted, and most desired species by the subsistence and commercial fisheries in the CMA; although, all species are harvested by both fisheries. Results from this study's surveys about salmon uses and harvests (by all gear types) in 2014, 2015, and 2016 are presented below for each study community and study year. Harvests of all salmon species are presented in pounds usable weight and amounts (individual fish) (see Appendix C for conversion factors). The harvest category includes salmon harvested by any member of all surveyed households during each study year. The use category includes all salmon harvested, received, given away, or used by all households. Purchased salmon are not included within the harvest or use categories.

Chignik Bay

2014

Harvest, Use, and Sharing Patterns

In 2014, an estimated 100% of households in Chignik Bay used salmon, 36% of households attempted to harvest salmon, a total estimated 36% harvested salmon, 76% received salmon, and 32% gave away salmon (Figure 3-21). All five species of Pacific salmon found in Alaska were used, harvested, and shared by Chignik Bay households in 2014 (Table 3-17). Sockeye salmon was the most used and shared species by Chignik Bay households in 2014: 96% of all households used, 28% attempted to harvest, 28% harvested, 72% received, and 32% gave away sockeye salmon. Coho salmon was the second most used and shared salmon species: 48% of households used, 12% harvested, 36% received, and 8% gave away this resource. Chinook salmon were used by 40% of Chignik Bay households, 16% of households attempted to harvest and harvested, 28% received, and 16% gave away Chinook salmon. Pink salmon (used by 16% of households) and chum salmon (used by 8%) were used the least.

Harvest Quantities and Composition

In 2014, a total of 1,785 salmon (9,008 lb) were harvested by Chignik Bay households. This harvest equated to an average of 60 salmon (300 lb) per household and 23 salmon (117 lb) per capita. Sockeye salmon represented 91% (8,210 lb; 1,661 fish) of Chignik Bay's total salmon harvest weight, which equated to 274 lb (55 fish) of sockeye salmon harvested per household, or an estimated 107 lb (22 fish) harvested per capita (Figure 3-22; Table 3-17).

Coho salmon was Chignik Bay's second most harvested salmon species representing 7% (578 lb; 94 fish) of the community harvest by weight, followed by Chinook salmon representing 2% (184 lb; 23 fish), and chum and pink salmon both representing less than 1% of the total salmon harvest weight in 2014.

Harvests by Gear Type

In 2014, based on household surveys, an estimated 57% of the total salmon harvest weight caught by Chignik Bay households was harvested with subsistence gear (7% by gillnet and 50% by seine), less than 1% by rod and reel, and 42% of the salmon harvest weight was removed from commercial catches (Table 3-18). An estimated 58% of the sockeye salmon catch was harvested with subsistence gear (7% by gillnet and 51% by seine) and 42% was removed from commercial catches. Coho salmon were harvested by nearly the same harvest weight proportion by removals from commercial catches (53%) and by subsistence seine nets (45%), with the remaining 3% harvested by rod and reel. The Chinook salmon harvest was caught primarily by seine nets (68%) and the remainder by removals from commercial harvests (32%). Very few

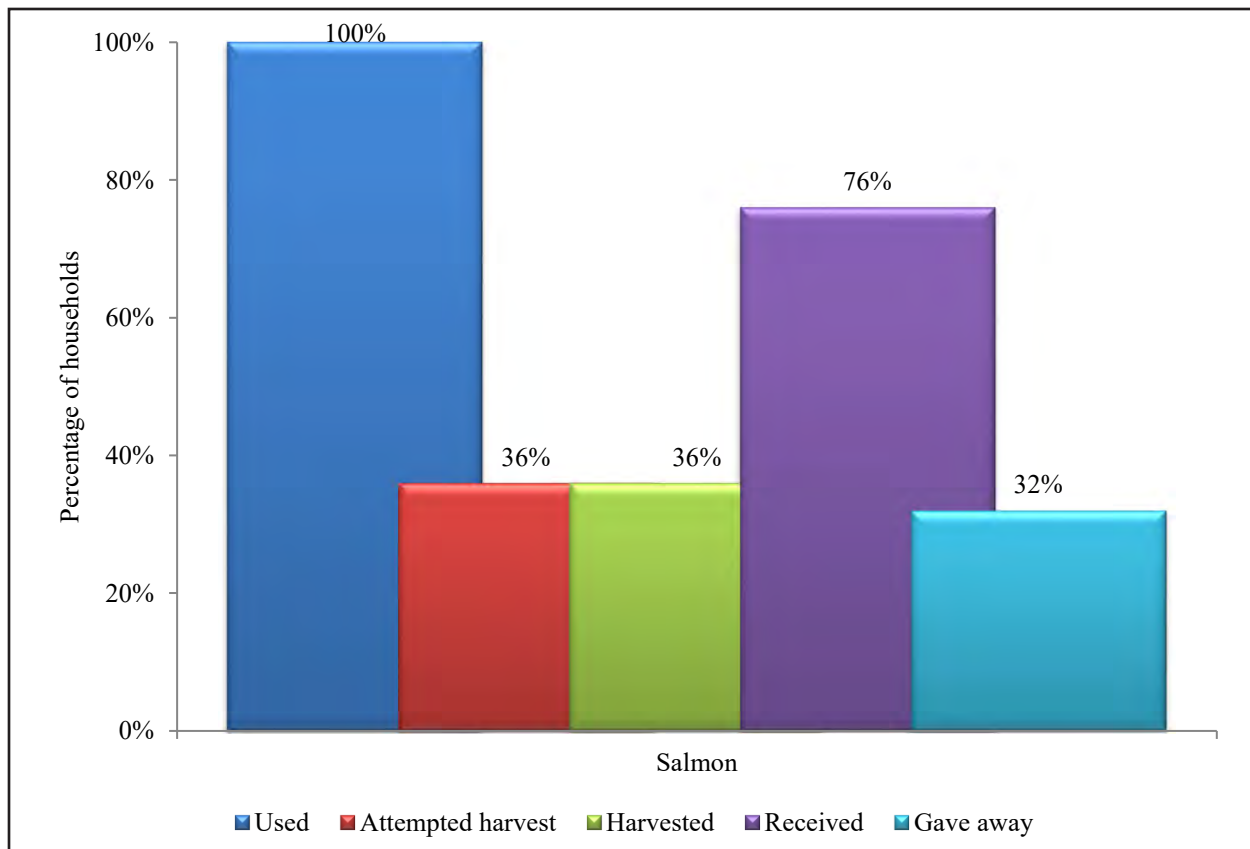


Figure 3-21.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Chignik Bay, 2014.

pink and chum salmon were harvested in 2014 by Chignik Bay residents and all were harvested by rod and reel.

For the 2014 estimated harvest of all salmon species combined, most, or 1,019 salmon (5,135 lb), were harvested with subsistence gear: the harvest comprised 899 fish (4,542 lb) caught by seine and 120 fish (593 lb) caught by gillnet (Table 3-19). In addition, 757 total salmon (3,823 lb) were removed from commercial harvests for home use, and 10 fish (50 lb) were harvested with rod and reel gear. Sockeye salmon were primarily taken by subsistence gear (961 fish; 4,751 lb), followed by removals from commercial harvests (700 fish, or 3,460 lb) (Figure 3-23; Table 3-19). More of the subsistence sockeye salmon were harvested by seine than gillnet: 841 fish (4,158 lb) were harvested by seine, and the entire community gillnet harvest (120 fish) was sockeye salmon. As stated earlier, about one-half of coho salmon harvested in 2014 by Chignik Bay residents came from removals from commercial harvests (49 fish; 304 lb), and the other one-half by subsistence seine nets (42 fish; 260 lb); only 2 fish (15 lb) were harvested by rod and reel. Chinook salmon were primarily obtained with subsistence seine gear (16 fish; 124 lb) and 8 fish (59 lb) were obtained by removals from commercial harvests.

Table 3-17.—Estimated uses and harvests of salmon, Chignik Bay, 2014.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Salmon	100.0	36.0	36.0	76.0	32.0	9,007.8	300.3	117.3	1,785.1 ind		59.5	32.0
Chinook salmon	40.0	16.0	16.0	28.0	16.0	183.8	6.1	2.4	23.1 ind		0.8	42.2
Sockeye salmon	96.0	28.0	28.0	72.0	32.0	8,210.4	273.7	106.9	1,661.2 ind		55.4	32.8
Coho salmon	48.0	12.0	12.0	36.0	8.0	578.4	19.3	7.5	93.6 ind		3.1	75.6
Chum salmon	8.0	4.0	4.0	4.0	0.0	29.6	1.0	0.4	4.8 ind		0.2	84.3
Pink salmon	16.0	4.0	4.0	12.0	4.0	5.7	0.2	0.1	2.4 ind		0.1	84.3
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0

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

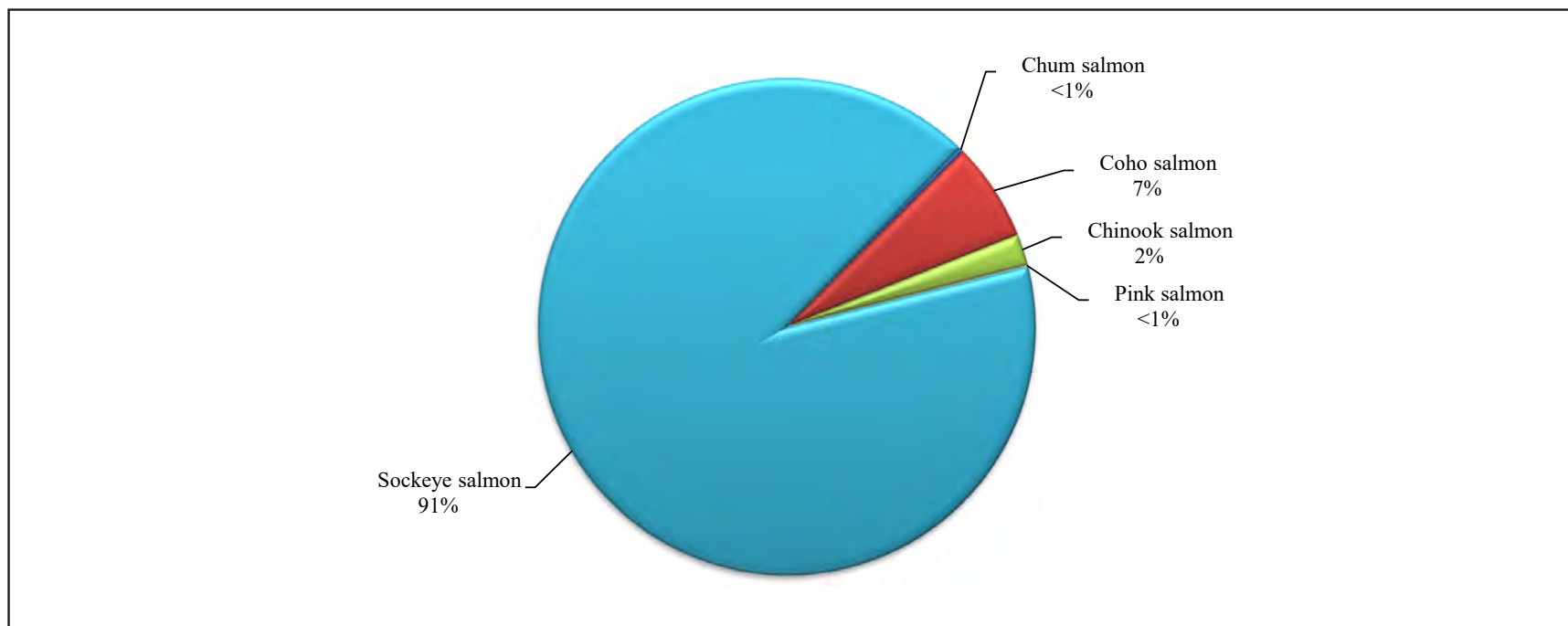


Figure 3-22.—Composition of salmon harvest in pounds usable weight, Chignik Bay, 2014.

Table 3-18.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Chignik Bay, 2014.

Resource	Percentage base	Removed from commercial catch	Subsistence methods					Any method
			Set gillnet	Seine	Other	Subsistence gear, any method	Rod and reel	
Salmon	Gear type	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%
	Resource	42.4%	6.6%	50.4%	0.0%	57.0%	0.6%	100.0%
	Total	42.4%	6.6%	50.4%	0.0%	57.0%	0.6%	100.0%
Chinook salmon	Gear type	1.6%	0.0%	2.7%	0.0%	2.4%	0.0%	2.0%
	Resource	32.3%	0.0%	67.7%	0.0%	67.7%	0.0%	100.0%
	Total	0.7%	0.0%	1.4%	0.0%	1.4%	0.0%	2.0%
Sockeye salmon	Gear type	90.5%	100.0%	91.5%	0.0%	92.5%	0.0%	91.1%
	Resource	42.1%	7.2%	50.6%	0.0%	57.9%	0.0%	100.0%
	Total	38.4%	6.6%	46.2%	0.0%	52.7%	0.0%	91.1%
Coho salmon	Gear type	8.0%	0.0%	5.7%	0.0%	5.1%	29.6%	6.4%
	Resource	52.6%	0.0%	44.9%	0.0%	44.9%	2.6%	100.0%
	Total	3.4%	0.0%	2.9%	0.0%	2.9%	0.2%	6.4%
Chum salmon	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	59.1%	0.3%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%
Pink salmon	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	11.3%	0.1%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%

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

Table 3-19.—Estimated harvest of salmon by gear type and resource, Chignik Bay, 2014.

Resource	Subsistence methods													
	Removed from commercial catch		Subsistence methods				Subsistence gear, any method				Rod and reel		Any method	
	Number	Pounds	Set gillnet	Seine	Other		Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	756.7	3,823.1	120.0	593.1	898.8	4,541.5	0.0	0.0	1,018.8	5,134.6	9.6	50.1	1,785.1	9,007.8
Chinook salmon	7.5	59.4	0.0	0.0	15.6	124.4	0.0	0.0	15.6	124.4	0.0	0.0	23.1	183.8
Sockeye salmon	700.0	3,459.7	120.0	593.1	841.2	4,157.6	0.0	0.0	961.2	4,750.7	0.0	0.0	1,661.2	8,210.4
Coho salmon	49.2	304.0	0.0	0.0	42.0	259.5	0.0	0.0	42.0	259.5	2.4	14.8	93.6	578.4
Chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	29.6	4.8	29.6
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	5.7	2.4	5.7

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

Note The harvested number of salmon is represented as individual fish harvested.

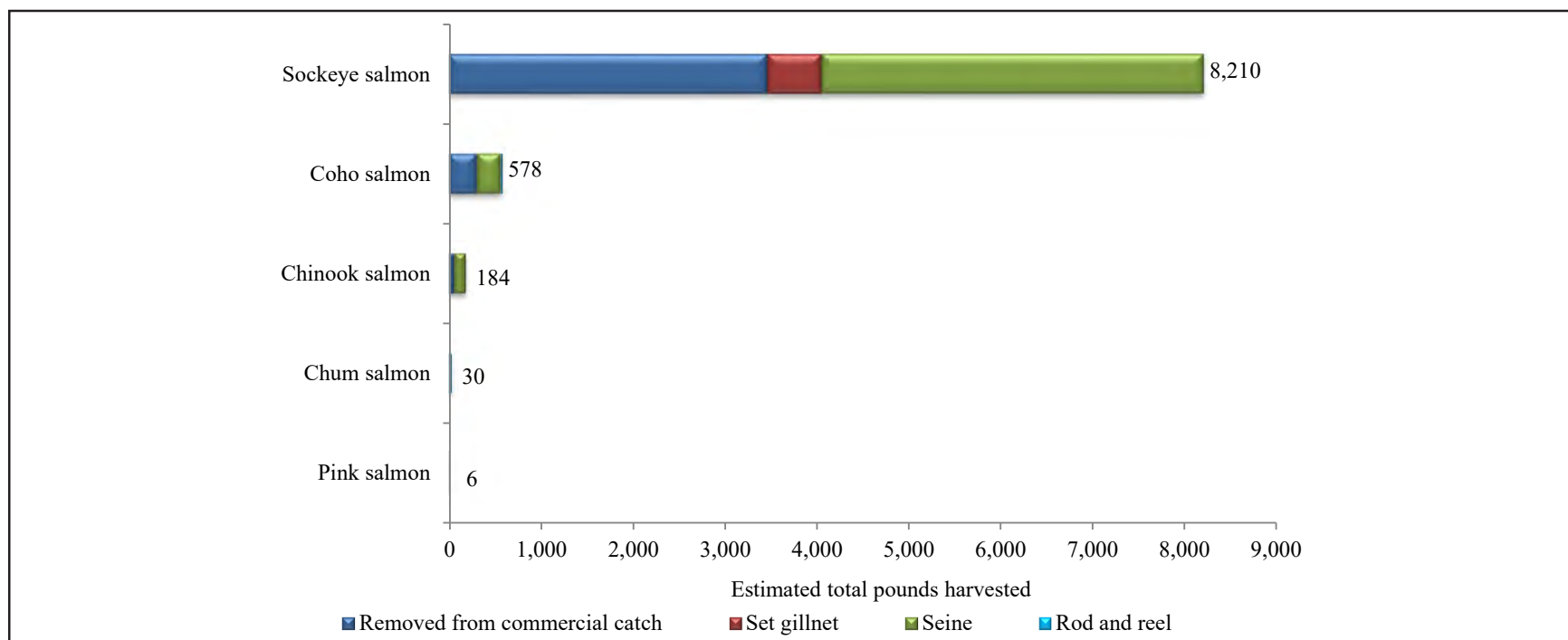


Figure 3-23.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Chignik Bay, 2014.

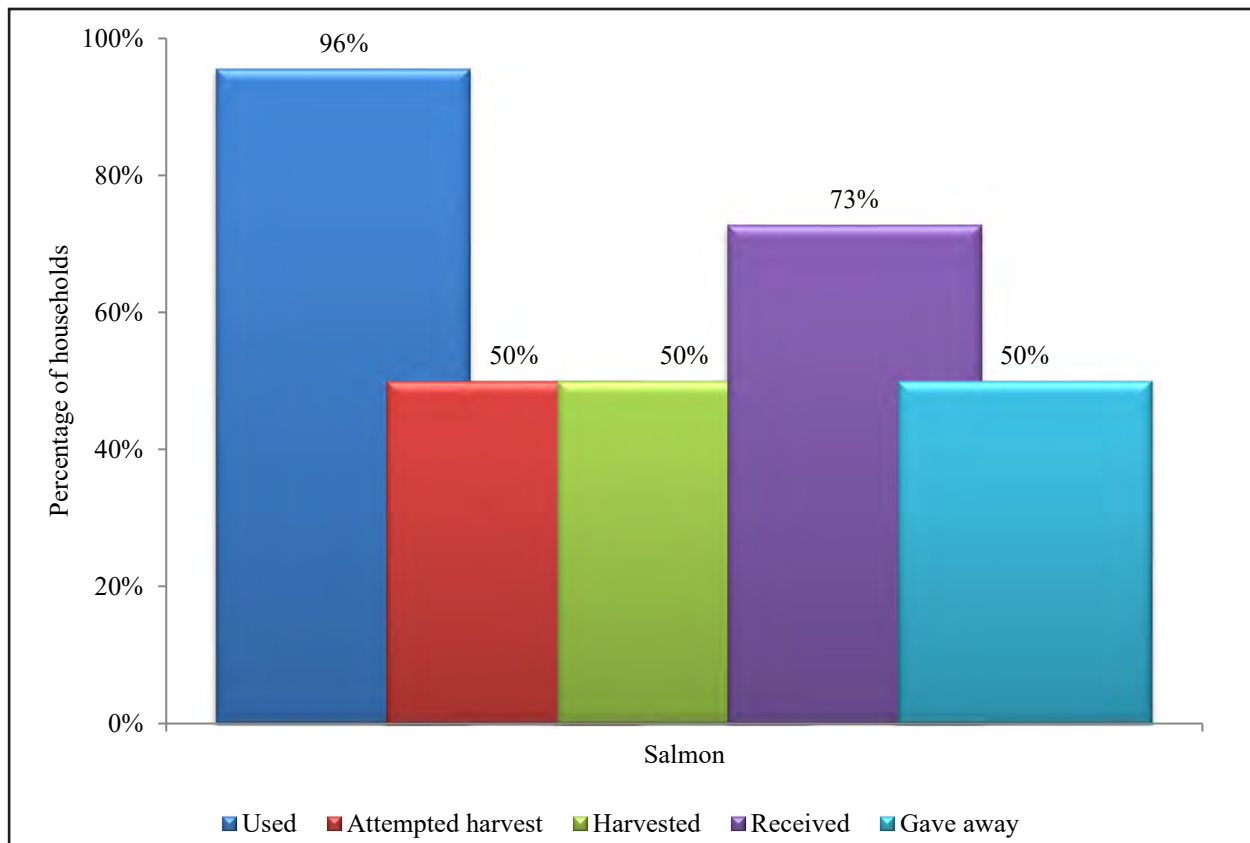


Figure 3-24.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Chignik Bay, 2015.

2015

Harvest, Use, and Sharing Patterns

In 2015, 96% of Chignik Bay households used salmon, 50% of households attempted to harvest salmon and all those households were successful harvesters, 73% received salmon, and 50% gave away salmon (Figure 3-24). All five species of Pacific salmon found in Alaska were used and harvested by Chignik Bay households in 2015; also, Chinook, sockeye, and coho salmon were shared with other households (Table 3-20). Similar to 2014, sockeye salmon was the most used and shared species: 86% of all households used, 36% attempted to harvest, 36% harvested, 59% received, and 41% gave away sockeye salmon. Chinook and coho salmon were each used by approximately one-half of households. Pink and chum salmon were used the least: 18% of households used and harvested pink salmon, and 9% both used and harvested chum salmon.

Harvest Quantities and Composition

In 2015, a total of 1,238 salmon (5,121 lb) were harvested by Chignik Bay residents. This equated to an average of 43 salmon (177 lb) harvested per household, and 17 salmon (72 lb) per capita. Sockeye salmon represented 90% of the total salmon harvest weight: this harvest comprised 1,134 salmon (4,614 lb), with an average of 159 lb (39 sockeye salmon) harvested per household, which equated to 65 lb (16 fish) harvested per capita (Figure 3-25; Table 3-20). Coho salmon was Chignik Bay's second most harvested species, which represented 4% of the salmon harvest weight, followed closely by Chinook salmon (4%). There was a total of 221 lb (46 fish) of coho salmon harvested, which equated to 8 lb (2 fish) per household.

The Chinook salmon harvest in pounds was close to that of coho salmon, with 201 lb harvested, or 26 fish. The Chinook salmon harvest averaged 7 lb (1 fish) per household. Pink salmon represented 1% of the total salmon weight harvested in 2015 with only a total of 54 lb (25 fish) harvested; chum salmon were harvested the least and composed less than 1% of all the salmon harvest weight.

Harvests by Gear Type

In 2015, based on household surveys, an estimated 62% of all salmon weight harvested by Chignik Bay residents was harvested with subsistence gear (18% by set gillnet and 43% by seine), 3% with rod and reel, and 35% was removed from commercial catches (Table 3-21). Overall, 65% of the sockeye salmon harvest weight was caught with subsistence gear (20% by set gillnet and 45% by seine) and the remainder (35%) was removed from commercial catches. Note that all of the set gillnet harvest in 2015 was sockeye salmon. Coho salmon were harvested mostly by rod and reel (71% of harvest weight), followed by subsistence methods (14% by methods other than gillnet or seine, 6% by seine), and removal from commercial catches (9%). Chinook salmon were also harvested by a variety of methods, with 50% of the harvest weight caught with subsistence seine gear, 45% by removal from commercial harvests, and 5% by rod and reel. Both pink and chum salmon were harvested primarily by removal from commercial harvests: 56% and 60% of the pink and chum salmon harvest weights, respectively. The remaining 40% of the chum salmon harvest weight was caught by subsistence seine; for the pink salmon harvest, 11% was harvested by subsistence seine, but a higher proportion (32%) was caught by another subsistence method.

Table 3-22 depicts the 2015 harvest of all salmon species by number of salmon and pounds harvested for each species by gear type. Most salmon (774 fish; 3,184 lb) were harvested with subsistence gear: 224 fish (912 lb) by gillnet, 535 fish (2,224 lb) by seine, and 15 fish (49 lb) by other subsistence gear. In addition, 430 total salmon, or 1,769 lb, were removed from commercial harvests for home use, and 34 fish, or 168 lb, were harvested with rod and reel gear. The sockeye salmon harvest weight, like total salmon, was primarily harvested by subsistence gear, followed by removal from commercial harvests (Figure 3-26). Out of a total of 1,134 sockeye salmon (4,614 lb) harvested, a total of 738 fish (3,004 lb) were harvested with subsistence net gear—224 fish (912 lb) by set gillnet and 514 fish (2,092 lb) by seine—and the remaining 396 fish (1,610 lb) were from commercial catch removals (Table 3-22). Most coho salmon harvested in 2015 by Chignik Bay residents were harvested with rod and reel (33 fish; 158 lb). Chinook salmon were obtained primarily by removal from commercial harvests (12 fish; 90 lb) and by subsistence seine (13 fish; 101 lb).

Table 3-20.—Estimated uses and harvests of salmon, Chignik Bay, 2015.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount		95% confidence limit (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	
Salmon	95.5	50.0	50.0	72.7	50.0	5,121.2	176.6	71.9	1,237.8 ind	42.7	42.4
Chinook salmon	54.5	18.2	18.2	50.0	31.8	200.9	6.9	2.8	26.4 ind	0.9	58.2
Sockeye salmon	86.4	36.4	36.4	59.1	40.9	4,613.9	159.1	64.8	1,133.6 ind	39.1	44.0
Coho salmon	50.0	27.3	27.3	27.3	22.7	220.8	7.6	3.1	46.1 ind	1.6	59.7
Chum salmon	9.1	9.1	9.1	0.0	0.0	31.7	1.1	0.4	6.6 ind	0.2	72.0
Pink salmon	18.2	18.2	18.2	0.0	0.0	53.9	1.9	0.8	25.0 ind	0.9	61.4
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind	0.0	0.0

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

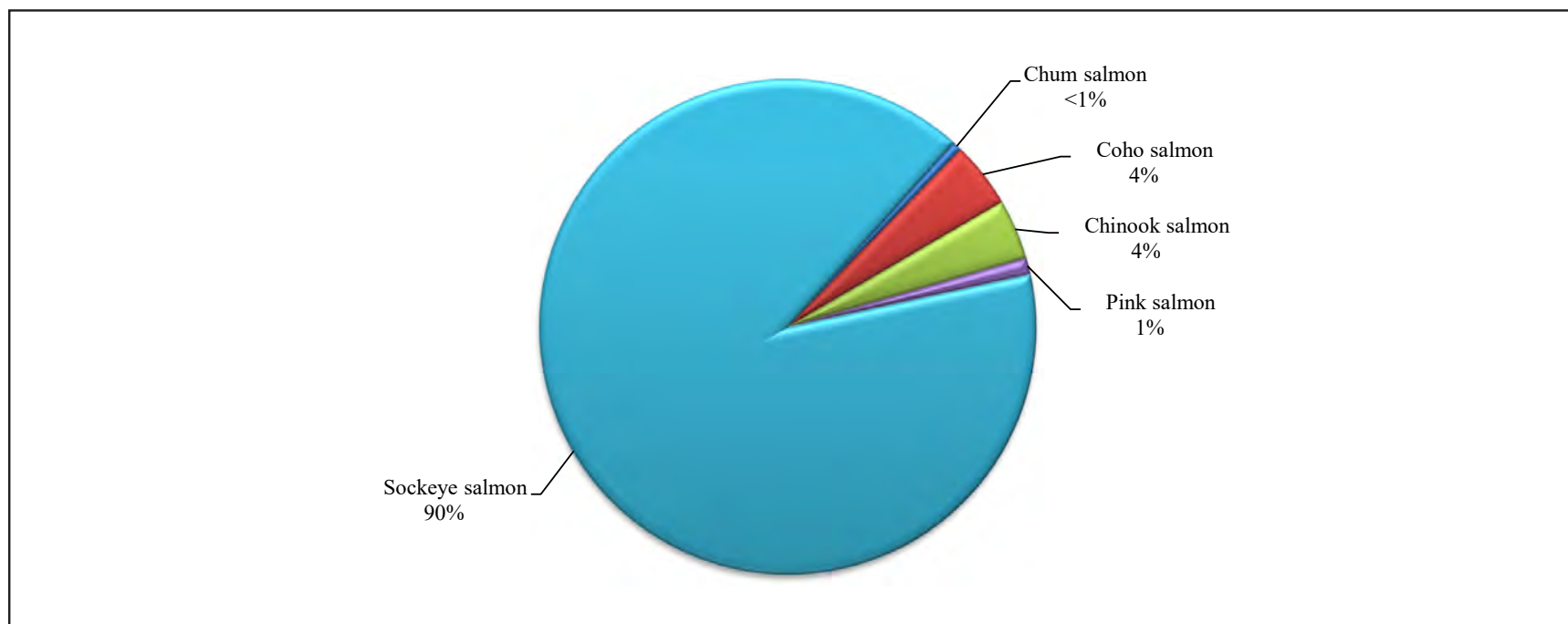


Figure 3-25.—Composition of salmon harvest in pounds usable weight, Chignik Bay, 2015.

Table 3-21.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Chignik Bay, 2015.

Resource	Percentage base	Removed from commercial catch	Subsistence methods					
			Set gillnet	Seine	Other	Subsistence gear, any method	Rod and reel	Any method
Salmon	Gear type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Resource	34.5%	17.8%	43.4%	0.9%	62.2%	3.3%	100.0%
	Total	34.5%	17.8%	43.4%	0.9%	62.2%	3.3%	100.0%
Chinook salmon	Gear type	5.1%	0.0%	4.5%	0.0%	3.2%	6.0%	3.9%
	Resource	45.0%	0.0%	50.0%	0.0%	50.0%	5.0%	100.0%
	Total	1.8%	0.0%	2.0%	0.0%	2.0%	0.2%	3.9%
Sockeye salmon	Gear type	91.0%	100.0%	94.1%	0.0%	94.3%	0.0%	90.1%
	Resource	34.9%	19.8%	45.3%	0.0%	65.1%	0.0%	100.0%
	Total	31.4%	17.8%	40.9%	0.0%	58.7%	0.0%	90.1%
Coho salmon	Gear type	1.1%	0.0%	0.6%	64.9%	1.4%	94.0%	4.3%
	Resource	8.6%	0.0%	5.7%	14.3%	20.0%	71.4%	100.0%
	Total	0.4%	0.0%	0.2%	0.6%	0.9%	3.1%	4.3%
Chum salmon	Gear type	1.1%	0.0%	0.6%	0.0%	0.4%	0.0%	0.6%
	Resource	60.0%	0.0%	40.0%	0.0%	40.0%	0.0%	100.0%
	Total	0.4%	0.0%	0.2%	0.0%	0.2%	0.0%	0.6%
Pink salmon	Gear type	1.8%	0.0%	0.3%	35.1%	0.7%	0.0%	1.1%
	Resource	57.9%	0.0%	10.5%	31.6%	42.1%	0.0%	100.0%
	Total	0.6%	0.0%	0.1%	0.3%	0.4%	0.0%	1.1%

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

Table 3-22.—Estimated harvest of salmon by gear type and resource, Chignik Bay, 2015.

Resource	Subsistence methods													
	Removed from commercial catch		Set gillnet		Seine		Other		Subsistence gear, any method		Rod and reel		Any method	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	429.7	1,769.1	224.1	912.1	535.2	2,223.8	14.5	48.6	773.8	3,184.4	34.3	167.7	1,237.8	5,121.2
Chinook salmon	11.9	90.4	0.0	0.0	13.2	100.5	0.0	0.0	13.2	100.5	1.3	10.0	26.4	200.9
Sockeye salmon	395.5	1,609.5	224.1	912.1	514.1	2,092.4	0.0	0.0	738.2	3,004.4	0.0	0.0	1,133.6	4,613.9
Coho salmon	4.0	18.9	0.0	0.0	2.6	12.6	6.6	31.5	9.2	44.2	33.0	157.7	46.1	220.8
Chum salmon	4.0	19.0	0.0	0.0	2.6	12.7	0.0	0.0	2.6	12.7	0.0	0.0	6.6	31.7
Pink salmon	14.5	31.2	0.0	0.0	2.6	5.7	7.9	17.0	10.5	22.7	0.0	0.0	25.0	53.9

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

Note The harvested number of salmon is represented as individual fish harvested.

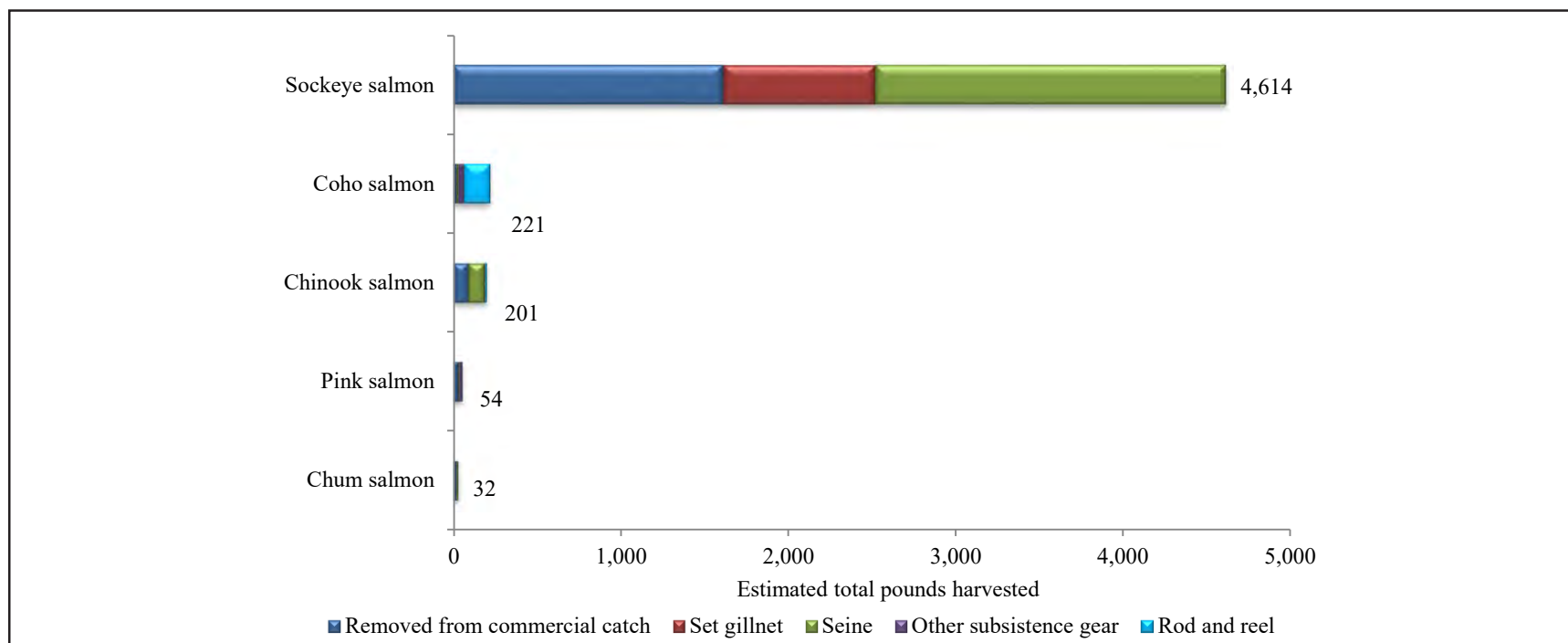


Figure 3-26.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Chignik Bay, 2015.

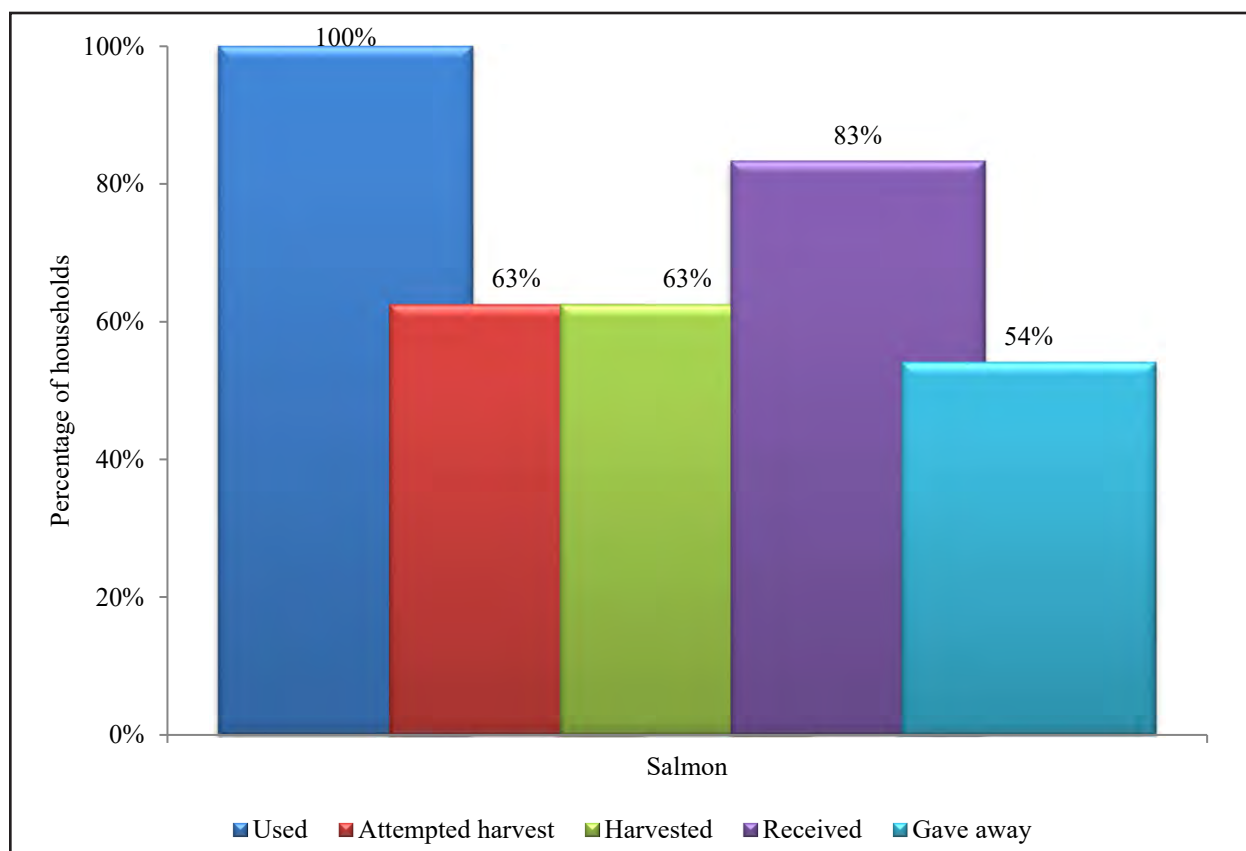


Figure 3-27.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Chignik Bay, 2016.

2016

Harvest, Use, and Sharing Patterns

In 2016 in Chignik Bay, all households used salmon; also, the majority of households harvested and shared salmon: 63% attempted to harvest and harvested salmon, and 83% received and 54% gave away salmon (Figure 3-27). Compared to the previous two study years, more households attempted to harvest and harvested salmon in 2016 (figures 3-21, 3-24, and 3-27). All five species of Pacific salmon found in Alaska, except for chum salmon, were used, harvested, and shared by Chignik Bay households in 2016 (Table 3-23). Similar to the previous study years, sockeye salmon was the most used, harvested, and shared species by Chignik Bay residents in 2016: 88% of all households used, 54% attempted to harvest as well as harvested, 50% received, and 46% of households gave away sockeye salmon. Chinook salmon were used by 50% of Chignik Bay households, 25% of households fished for and harvested, 29% received, and 21% gave away Chinook salmon in 2016. An estimated 25% of Chignik Bay households used coho salmon; in comparison, about one-half as many households (13%) fished for, harvested, and received coho salmon, and 8% of households gave away this species. Pink salmon was the least used identified species: only 8% of households used, and 4% harvested, pink salmon. Chum salmon were not harvested or used in 2016. Also, although an estimated 29% of households received salmon and were unsure of what species they received and used, no households harvested salmon of unknown species.

Harvest Quantities and Composition

In 2016, a total of 1,728 salmon (7,637 lb) were harvested by Chignik Bay residents. This equated to an average of 64 salmon (283 lb) harvested per household and 23 salmon (100 lb) per capita. Sockeye salmon represented 95% (1,656 fish; 7,259 lb) of Chignik Bay's total salmon harvest, which equated to 61 fish (269 lb) harvested per household and 95 lb (22 fish) per capita (Figure 3-28; Table 3-23). Chinook salmon was the second most used and harvested salmon species and represented 4% of the community harvest of salmon by weight (56 fish; 306 lb). Coho salmon represented only 1% of all the 2016 salmon harvest weight (11 fish; 59 lb) and pink salmon represented less than 1% (5 fish; 13 lb).

Harvests by Gear Type

In 2016, household survey results estimated that 69% of the salmon harvest weight caught by Chignik Bay residents was obtained by removal from commercial harvests, 31% of the harvest was caught from subsistence gear (predominantly by seine [27%]), and a nominal harvest of a single species was by rod and reel (Table 3-24). As was the case for total salmon, most of the sockeye salmon harvest weight (68%) was removed from commercial harvests, and 32% was harvested by subsistence gear (3% by gillnet and 29% by seine). Chinook salmon harvested for home use were primarily obtained by removal from commercial harvests (96% of harvest weight), and 4% of the Chinook salmon harvest weight was caught by rod and reel. The coho salmon harvest was caught mostly using subsistence set and drift gillnets (80%) and 20% was obtained by removal from commercial catches. The few pink salmon harvested were all removed from commercial harvests.

The 2016 harvests of all salmon species, by pounds and number of salmon harvested by gear type, by Chignik Bay households are depicted Table 3-25. Most salmon (1,191 fish; 5,275 lb) were harvested by removal from commercial harvests; additionally, an estimated 534 salmon (2,350 lb) were harvested with subsistence gear. A total of 1,131 sockeye salmon (4,956 lb) were removed from commercial harvests, and the rest were caught with subsistence gear, including set gillnet (14 fish; 59 lb), drift gillnet (34 fish; 148 lb), and seine (478 fish; 2,096 lb) (Figure 3-29; Table 3-25). Most Chinook salmon harvested in 2016 by Chignik Bay residents were removed from commercial harvests (54 fish; 294 lb); additionally, Chinook salmon were caught by rod and reel (2 fish; 12 lb). Coho salmon were harvested equally by subsistence set gillnet and drift gillnet (the subsistence gillnet harvest was nine fish); also, fewer fish were removed from commercial harvests (two fish).

Table 3-23.—Estimated uses and harvests of salmon, Chignik Bay, 2016.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount		95% confidence limit (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	
Salmon	100.0	62.5	62.5	83.3	54.2	7,637.0	282.9	99.8	1,728.0 ind	64.0	25.5
Chinook salmon	50.0	25.0	25.0	29.2	20.8	305.7	11.3	4.0	56.3 ind	2.1	41.9
Sockeye salmon	87.5	54.2	54.2	50.0	45.8	7,259.3	268.9	94.9	1,656.0 ind	61.3	25.8
Coho salmon	25.0	12.5	12.5	12.5	8.3	58.9	2.2	0.8	11.3 ind	0.4	39.7
Chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind	0.0	0.0
Pink salmon	8.3	8.3	4.2	4.2	4.2	13.2	0.5	0.2	4.5 ind	0.2	69.0
Unknown salmon	29.2	0.0	0.0	29.2	12.5	0.0	0.0	0.0	0.0 ind	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2017.

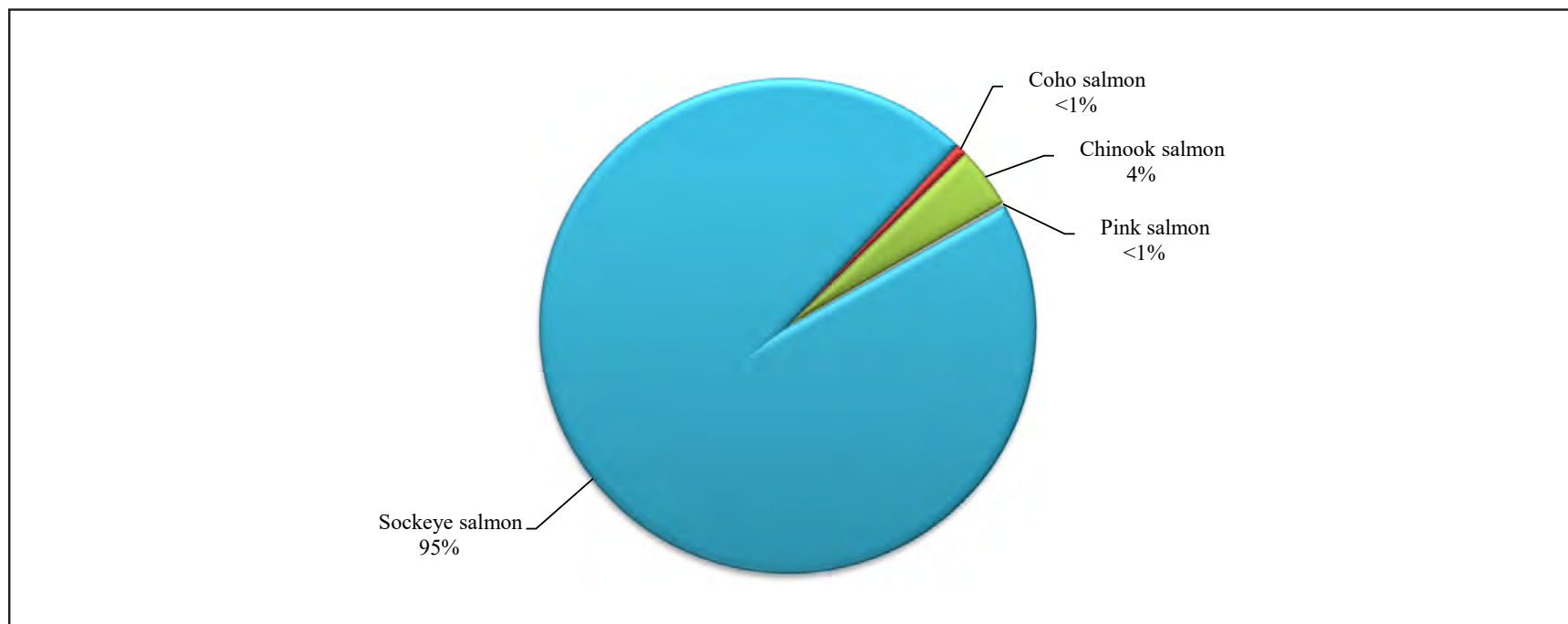


Figure 3-28.—Composition of salmon harvest in pounds usable weight, Chignik Bay, 2016.

Table 3-24.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Chignik Bay, 2016.

Resource	Percentage base	Removed from commercial catch	Subsistence methods				Subsistence gear, any method		
			Set gillnet	Drift gillnet	Seine	Other		Rod and reel	Any method
Salmon	Gear type	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%
	Resource	69.1%	1.1%	2.2%	27.4%	0.0%	30.8%	0.2%	100.0%
	Total	69.1%	1.1%	2.2%	27.4%	0.0%	30.8%	0.2%	100.0%
Chinook salmon	Gear type	5.6%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	4.0%
	Resource	96.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	100.0%
	Total	3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	4.0%
Sockeye salmon	Gear type	94.0%	71.5%	86.3%	100.0%	0.0%	98.0%	0.0%	95.1%
	Resource	68.3%	0.8%	2.0%	28.9%	0.0%	31.7%	0.0%	100.0%
	Total	64.9%	0.8%	1.9%	27.4%	0.0%	30.2%	0.0%	95.1%
Coho salmon	Gear type	0.2%	28.5%	13.7%	0.0%	0.0%	2.0%	0.0%	0.8%
	Resource	20.0%	40.0%	40.0%	0.0%	0.0%	80.0%	0.0%	100.0%
	Total	0.2%	0.3%	0.3%	0.0%	0.0%	0.6%	0.0%	0.8%
Chum salmon	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pink salmon	Gear type	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%

Source ADF&G Division of Subsistence household surveys, 2017.

Note Only for study year 2016 did harvest estimates distinguish between set and drift gillnet use.

Table 3-25.—Estimated harvest of salmon by gear type and resource, Chignik Bay, 2016.

Resource	Subsistence methods															
	Removed from commercial catch		Subsistence methods				Subsistence gear, any method				Rod and reel		Any method			
	Number	Pounds	Set gillnet	Drift gillnet	Seine	Other	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	1,191.4	5,274.6	18.0	82.7	38.3	171.5	478.1	2,095.9	0.0	0.0	534.4	2,350.1	2.3	12.2	1,728.0	7,637.0
Chinook salmon	54.0	293.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	12.2	56.3	305.7
Sockeye salmon	1,130.6	4,956.2	13.5	59.2	33.8	147.9	478.1	2,095.9	0.0	0.0	525.4	2,303.0	0.0	0.0	1,656.0	7,259.3
Coho salmon	2.3	11.8	4.5	23.5	4.5	23.5	0.0	0.0	0.0	0.0	9.0	47.1	0.0	0.0	11.3	58.9
Chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink salmon	4.5	13.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	13.2

Source ADF&G Division of Subsistence household surveys, 2017.

Note The harvested number of salmon is represented as individual fish harvested.

Note Only for study year 2016 did harvest estimates distinguish between set and drift gillnet use.

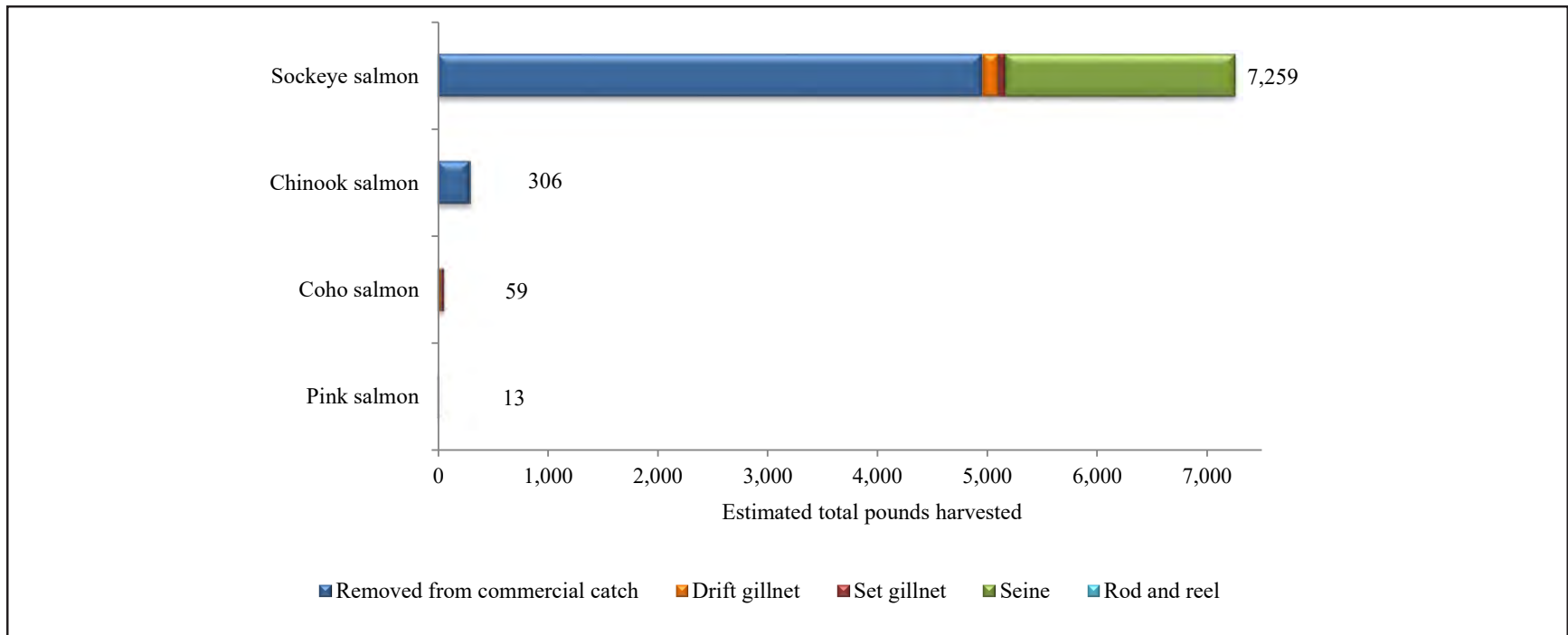


Figure 3-29.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Chignik Bay, 2016.

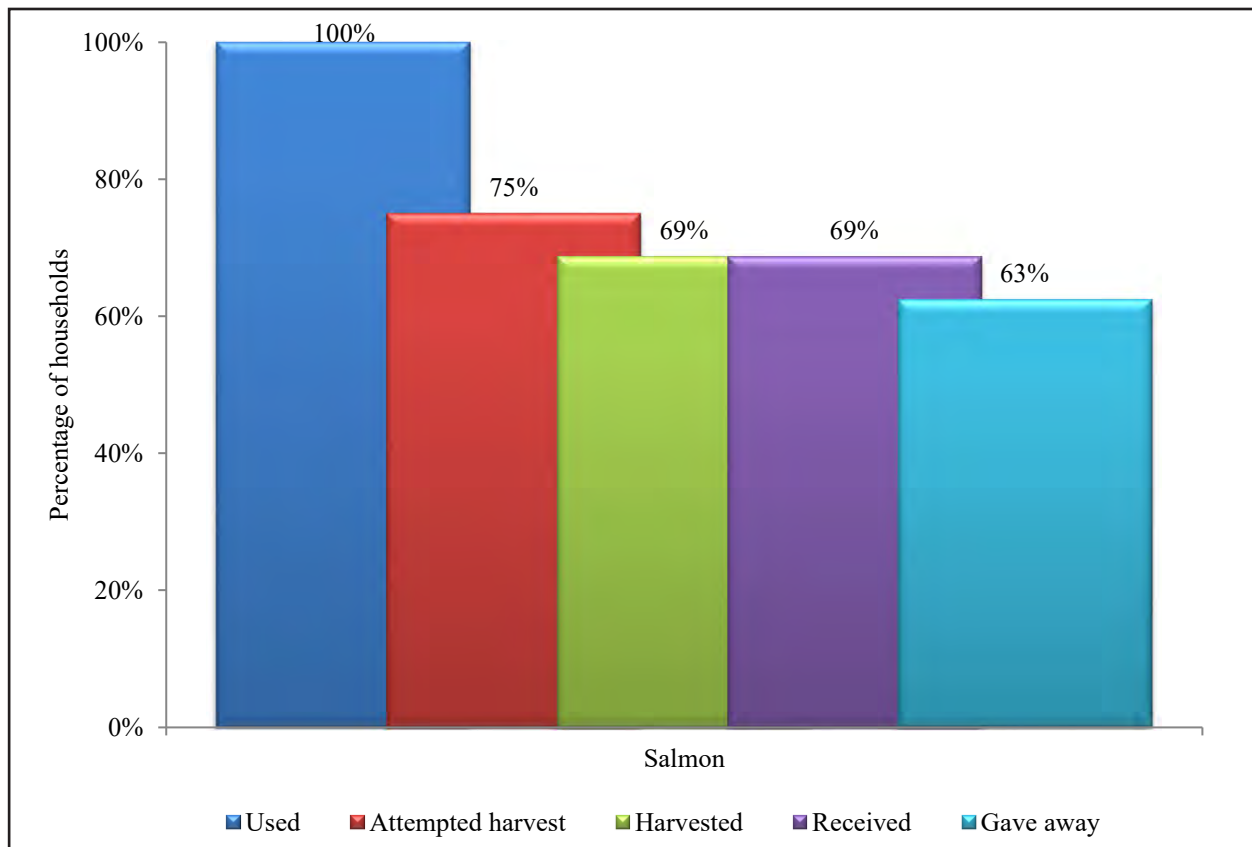


Figure 3-30.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Chignik Lagoon, 2014.

Chignik Lagoon

2014

Harvest, Use, and Sharing Patterns

In 2014, 100% of households in Chignik Lagoon used salmon, 75% of households attempted to harvest salmon, 69% harvested salmon, 69% received salmon, and 63% gave away salmon (Figure 3-30). All five species of Pacific salmon found in Alaska were used, harvested, and given away by Chignik Lagoon households in 2014 (Table 3-26). Sockeye salmon was the most used and shared species in Chignik Lagoon in 2014: 100% of households used, 75% attempted to harvest, 69% harvested, 63% received, and 63% gave away sockeye salmon. Chinook salmon was the second most used and shared species by Chignik Lagoon residents: 75% of households used, 63% attempted to harvest, 50% harvested, 44% received, and 31% gave away this resource. Coho and pink salmon were each used (19%), harvested (19%), and given away (13%) by Chignik Lagoon households. No households received coho or pink salmon resources, indicating the shared fish might have been sent to households outside this community. Chum salmon was used least, with only an estimated 6% of households having used and harvested this species in 2014.

Harvest Quantities and Composition

In 2014, a total of 2,134 salmon (10,706 lb) were harvested by Chignik Lagoon residents. This equated to an average of 85 salmon (428 lb) harvested per household and 30 salmon (152 lb) per capita. Sockeye salmon represented 91% (9,707 lb; 1,964 fish) of Chignik Lagoon's total salmon harvest weight (Figure

3-31; Table 3-26). This harvest equated to 388 lb (79 fish) harvested per household, with a per capita harvest of 138 lb, or 28 sockeye salmon per capita. Chinook salmon was Chignik Lagoon's second most harvested salmon species representing 5% of the community harvest by weight; an estimated 586 lb (73 fish) were harvested, which equated to an average household harvest of 23 lb, or 8 lb per capita. The remaining species were harvested and used in 2014 by a much smaller proportion of Chignik Lagoon households. Coho salmon represented 3% (280 lb; 45 fish), pink salmon represented 1% (114 lb; 48 fish), and chum salmon represented less than 1% of the total salmon harvest weight in 2014.

Harvests by Gear Type

In 2014, based on household surveys, an estimated 79% of all the harvested salmon weight was harvested with subsistence gear (5% by gillnet and 74% by seine), 20% was removed from commercial catches, and 1% was caught with rod and reel (Table 3-27). Eighty-four percent of the sockeye salmon catch weight was harvested with subsistence gear (4% by gillnet and 80% by seine) and 16% was removed from commercial catches. The Chinook salmon harvest was primarily removed from commercial catches (75% of harvest weight), followed by rod and reel (15%), and, lastly, by subsistence gear (11% of harvest weight—2% by gillnet and 9% by seine). Coho salmon were harvested primarily with subsistence gillnets (66% of harvest weight); the remainder of the harvest was commercial catch removals (35%). The few pink salmon harvested were mostly obtained by removal from commercial harvests (81% of harvest weight).

Reviewing the 2014 harvest of all salmon species by number of salmon and pounds harvested by gear, most salmon (1,702 fish; 8,450 lb) were harvested with subsistence gear: 1,592 fish (7,868 lb) were harvested by seine, and 109 fish (582 lb) by gillnet (Table 3-28). In addition, 422 total salmon (2,169 lb) were removed from commercial harvests for home use, and 11 fish (147 lb) were harvested with rod and reel gear, all of which were Chinook salmon (Figure 3-32). Sockeye salmon were primarily taken by subsistence gear, followed by removal from commercial harvests, with a total of 1,652 fish (8,163 lb) and 313 fish (1,545 lb) harvested, respectively (Table 3-28). Most Chinook salmon harvested by Chignik Lagoon residents for home use in 2014 were removed from commercial harvests—55 fish, or 436 lb—but also 11 fish were harvested with rod and reel, 12 fish by subsistence set gillnet, and 6 fish by seine. Coho salmon were harvested by subsistence gillnet (30 fish; 184 lb) and by commercial removals (16 fish; 97 lb). Most pink salmon (39 fish) were taken from commercial removals and 9 fish by subsistence seine, and the few chum salmon harvested were caught with a seine.

Table 3-26.—Estimated uses and harvests of salmon, Chignik Lagoon, 2014.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount		95% confidence limit (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	
Salmon	100.0	75.0	68.8	68.8	62.5	10,706.4	428.3	152.3	2,134.4 ind	85.4	34.2
Chinook salmon	75.0	62.5	50.0	43.8	31.3	585.5	23.4	8.3	73.4 ind	2.9	64.9
Sockeye salmon	100.0	75.0	68.8	62.5	62.5	9,707.2	388.3	138.1	1,964.1 ind	78.6	35.2
Coho salmon	18.8	18.8	18.8	0.0	12.5	280.0	11.2	4.0	45.3 ind	1.8	68.8
Chum salmon	6.3	6.3	6.3	0.0	6.3	19.3	0.8	0.3	3.1 ind	0.1	127.9
Pink salmon	18.8	18.8	18.8	0.0	12.5	114.4	4.6	1.6	48.4 ind	1.9	73.9
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind	0.0	0.0

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

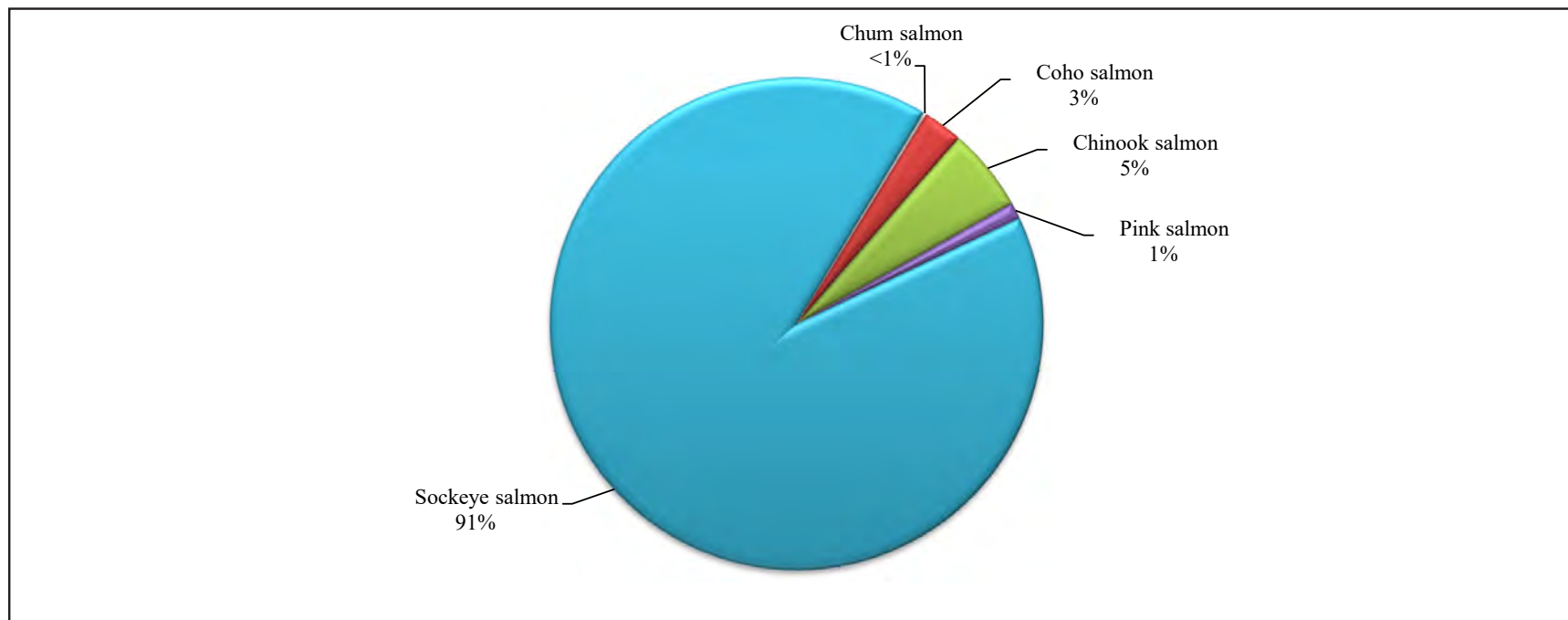


Figure 3-31.—Composition of salmon harvest in pounds usable weight, Chignik Lagoon, 2014.

Table 3-27.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Chignik Lagoon, 2014.

Resource	Percentage base	Removed from commercial catch	Subsistence methods					Any method
			Set gillnet	Seine	Other	Subsistence gear, any method	Rod and reel	
Salmon	Gear type	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%
	Resource	20.3%	5.4%	73.5%	0.0%	78.9%	0.8%	100.0%
	Total	20.3%	5.4%	73.5%	0.0%	78.9%	0.8%	100.0%
Chinook salmon	Gear type	20.1%	2.1%	0.6%	0.0%	0.7%	100.0%	5.5%
	Resource	74.5%	2.1%	8.5%	0.0%	10.6%	14.9%	100.0%
	Total	4.1%	0.1%	0.5%	0.0%	0.6%	0.8%	5.5%
Sockeye salmon	Gear type	71.2%	66.3%	98.8%	0.0%	96.6%	0.0%	90.7%
	Resource	15.9%	4.0%	80.1%	0.0%	84.1%	0.0%	100.0%
	Total	14.4%	3.6%	72.6%	0.0%	76.2%	0.0%	90.7%
Coho salmon	Gear type	4.5%	31.5%	0.0%	0.0%	2.2%	0.0%	2.6%
	Resource	34.5%	65.5%	0.0%	0.0%	65.5%	0.0%	100.0%
	Total	0.9%	1.7%	0.0%	0.0%	1.7%	0.0%	2.6%
Chum salmon	Gear type	0.0%	0.0%	0.2%	0.0%	0.2%	0.0%	0.2%
	Resource	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.2%	0.0%	0.2%	0.0%	0.2%
Pink salmon	Gear type	4.3%	0.0%	0.3%	0.0%	0.3%	0.0%	1.1%
	Resource	80.6%	0.0%	19.4%	0.0%	19.4%	0.0%	100.0%
	Total	0.9%	0.0%	0.2%	0.0%	0.2%	0.0%	1.1%

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

Table 3-28.—Estimated harvest of salmon by gear type and resource, Chignik Lagoon, 2014.

Resource	Subsistence methods													
	Removed from commercial catch		Set gillnet		Seine		Other		Subsistence gear, any method		Rod and reel		Any method	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	421.9	2,169.3	109.4	582.0	1,592.2	7,867.9	0.0	0.0	1,701.6	8,449.9	10.9	87.2	2,134.4	10,706.4
Chinook salmon	54.7	436.0	1.6	12.5	6.3	49.8	0.0	0.0	7.8	62.3	10.9	87.2	73.4	585.5
Sockeye salmon	312.5	1,544.5	78.1	386.1	1,573.4	7,776.6	0.0	0.0	1,651.6	8,162.7	0.0	0.0	1,964.1	9,707.2
Coho salmon	15.6	96.5	29.7	183.4	0.0	0.0	0.0	0.0	29.7	183.4	0.0	0.0	45.3	280.0
Chum salmon	0.0	0.0	0.0	0.0	3.1	19.3	0.0	0.0	3.1	19.3	0.0	0.0	3.1	19.3
Pink salmon	39.1	92.3	0.0	0.0	9.4	22.1	0.0	0.0	9.4	22.1	0.0	0.0	48.4	114.4

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

Note The harvested number of salmon is represented as individual fish harvested.

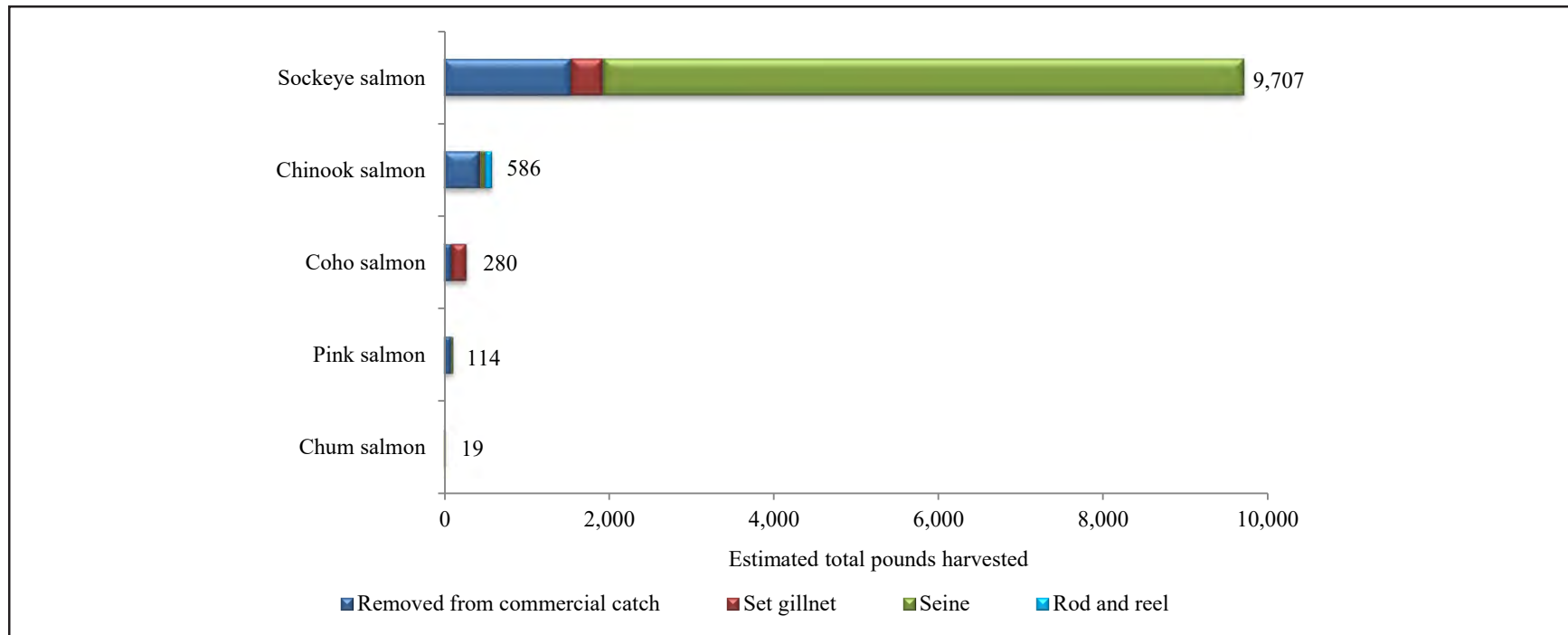


Figure 3-32.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Chignik Lagoon, 2014.

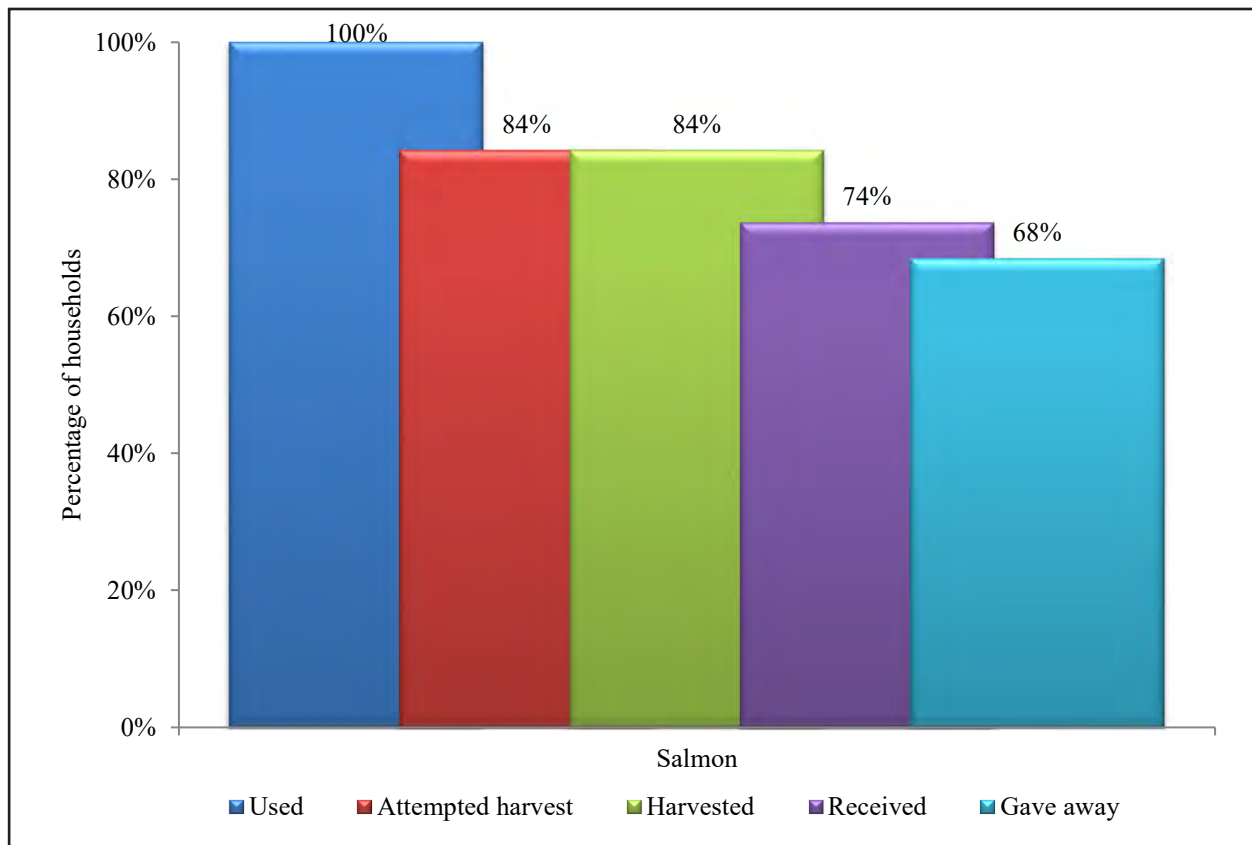


Figure 3-33.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Chignik Lagoon, 2015.

2015

Harvest, Use, and Sharing Patterns

In 2015, 100% of households in Chignik Lagoon used salmon, 84% of households attempted to harvest salmon, 84% harvested salmon, 68% gave away salmon, and 74% received salmon (Figure 3-33). All species of Pacific salmon found in Alaska were used and harvested by Chignik Lagoon households in 2015 (Table 3-29). Like in 2014, sockeye salmon was the most used and shared species by Chignik Lagoon residents: 100% of households used, 84% attempted to harvest and harvested, 68% received, and 68% gave away sockeye salmon. Chinook salmon was second most frequently harvested species (58% of households) and this resource was used by 68% of households; also, 16% of households received, and 21% gave away, Chinook salmon. Coho salmon were used by 40% of households, 26% harvested, 21% received, and 11% gave away this resource in 2015. Pink and chum salmon were used and harvested the least: 11% of households used and harvested pink salmon, and 5% used and harvested chum salmon.

Harvest Quantities and Composition

In 2015, a total of 3,899 salmon (16,732 lb) were harvested by Chignik Lagoon residents. This equated to an average harvest of 150 salmon (644 lb) per household and 51 salmon (218 lb) per capita. Sockeye salmon represented 83% (13,868 lb; 3,407 fish) of Chignik Lagoon's total salmon harvest weight with an average of 533 lb (131 fish) of sockeye salmon harvested per household, and a per capita harvest of 181 lb (44 fish) (Figure 3-34: Table 3-29). Chinook salmon was Chignik Lagoon's second most used species and represented 9% of the total salmon harvest weight, followed closely by coho salmon (8% of harvest

weight). Chinook salmon harvested in 2015 totaled 1,523 lb (200 fish); this harvest averaged 59 lb (8 fish) per household, and 20 lb (3 fish) per capita. For the coho salmon harvest, a total of 1,264 lb (264 fish) were harvested, which equated to 49 lb (10 fish) per household, or 17 lb per capita. Pink and chum salmon each represented less than 1% of the total salmon harvested by weight, with 44 lb (21 fish) of pink salmon harvested, and 33 lb (7 fish) of chum salmon harvested in 2015.

Harvests by Gear Type

In 2015, based on household surveys, an estimated 76% of all the salmon harvest weight was harvested by Chignik Lagoon residents with subsistence gear (12% by gillnet; 63% by seine; 1% by other method [i.e., handline or jig]); also, 1% was caught with rod and reel, and 21% was removed from commercial catches (Table 3-30). Eighty-five percent of the sockeye salmon catch was harvested with subsistence gear: 10% by gillnet, 73% by seine, and 2% by other subsistence gear. Further, 15% of the sockeye salmon harvest weight was removed from commercial catches. Most (79%) of the coho salmon harvest weight was caught by subsistence methods (53% by gillnet and 26% by seine), and 21% was obtained through removal from commercial harvests. The Chinook salmon harvest weight was mostly harvested by removal from commercial harvests (81%), and the rest by rod and reel (19%). Pink salmon were harvested by subsistence seine net and by removal from commercial harvests: 67% and 33% of the species harvest weight, respectively. The only harvest method for chum salmon was removal from commercial catches.

Table 3-31 depicts the 2015 harvest of all salmon species by number of salmon and pounds harvested by gear. Most salmon (3,105 fish; 12,761 lb) were harvested with subsistence gear: 472 fish (2,022 lb) were harvested by gillnet; 2,578 fish (10,516 lb) were harvested by seine; and only sockeye salmon were harvested by other methods (i.e., hand or dip net), which totaled 55 fish (229 lb). In addition, 755 total salmon (3,679 lb) were removed from commercial harvests for home use, and only Chinook salmon were harvested with rod and reel gear, which totaled 38 fish (292 lb). Seine nets harvested more of the sockeye salmon, and all of the pink salmon, subsistence gear harvest; but, set gillnets harvested more of the coho salmon subsistence gear harvest (Figure 3-35). No Chinook or chum salmon were harvested by subsistence methods. In addition to 2,882 sockeye salmon harvested by subsistence gear, 526 fish were retained from commercial harvests (Table 3-31).

Table 3-29.—Estimated uses and harvests of salmon, Chignik Lagoon, 2015.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount		95% confidence limit (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	
Salmon	100.0	84.2	84.2	73.7	68.4	16,731.5	643.5	218.3	3,898.6 ind	149.9	24.5
Chinook salmon	68.4	57.9	57.9	15.8	21.1	1,522.6	58.6	19.9	199.8 ind	7.7	44.0
Sockeye salmon	100.0	84.2	84.2	68.4	68.4	13,868.0	533.4	181.0	3,407.4 ind	131.1	25.0
Coho salmon	36.8	26.3	26.3	15.8	10.5	1,263.7	48.6	16.5	264.1 ind	10.2	52.3
Chum salmon	5.3	5.3	5.3	0.0	0.0	32.9	1.3	0.4	6.8 ind	0.3	109.0
Pink salmon	10.5	10.5	10.5	0.0	0.0	44.2	1.7	0.6	20.5 ind	0.8	79.4
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind	0.0	0.0

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

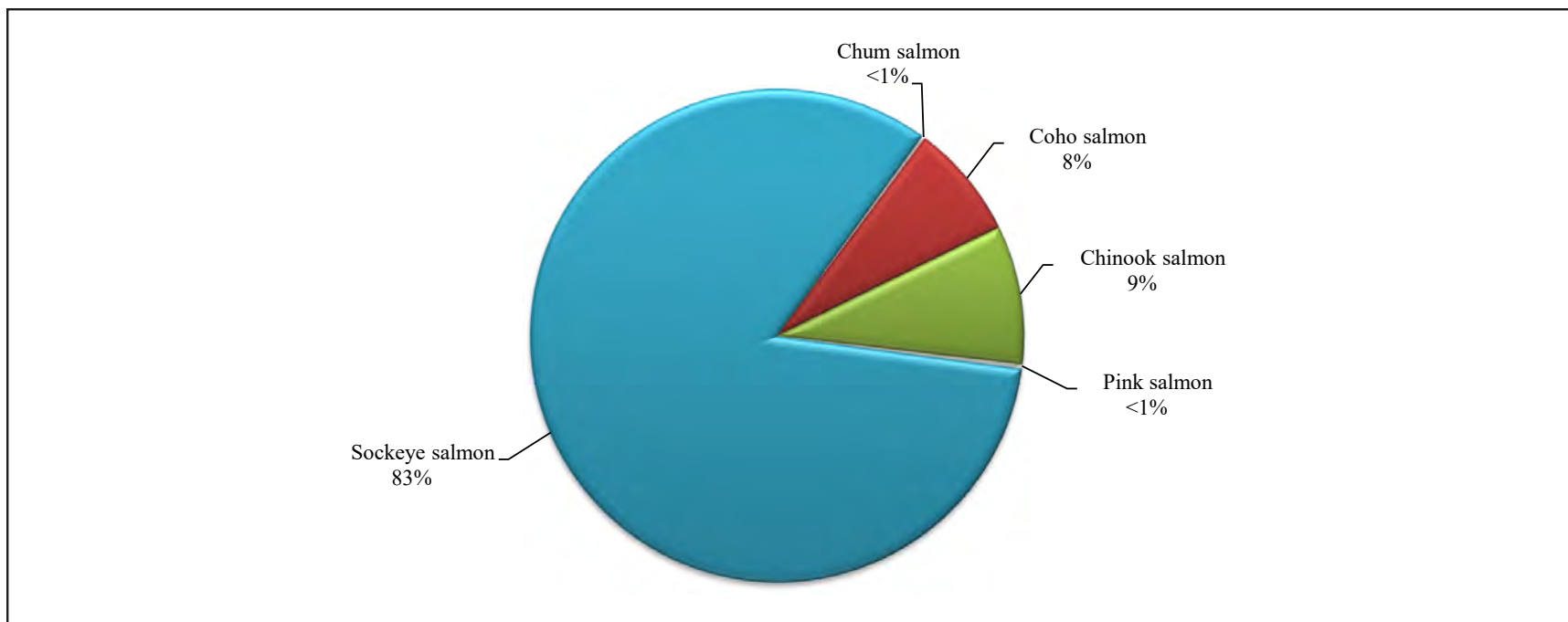


Figure 3-34.—Composition of salmon harvest in pounds usable weight, Chignik Lagoon, 2015.

Table 3-30.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Chignik Lagoon, 2015.

Resource	Percentage base	Removed from commercial catch	Subsistence methods					
			Set gillnet	Seine	Other	Subsistence gear, any method	Rod and reel	Any method
Salmon	Gear type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Resource	22.0%	12.1%	62.8%	1.3%	76.3%	1.7%	100.0%
	Total	22.0%	12.1%	62.8%	1.3%	76.3%	1.7%	100.0%
Chinook salmon	Gear type	33.5%	0.0%	0.0%	0.0%	0.0%	100.0%	9.1%
	Resource	80.8%	0.0%	0.0%	0.0%	0.0%	19.2%	100.0%
	Total	7.4%	0.0%	0.0%	0.0%	0.0%	1.7%	9.1%
Sockeye salmon	Gear type	58.1%	66.6%	96.6%	100.0%	91.9%	0.0%	82.9%
	Resource	15.4%	9.7%	73.3%	1.6%	84.6%	0.0%	100.0%
	Total	12.8%	8.1%	60.7%	1.3%	70.1%	0.0%	82.9%
Coho salmon	Gear type	7.1%	33.4%	3.1%	0.0%	7.9%	0.0%	7.6%
	Resource	20.7%	53.4%	25.9%	0.0%	79.3%	0.0%	100.0%
	Total	1.6%	4.0%	2.0%	0.0%	6.0%	0.0%	7.6%
Chum salmon	Gear type	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Pink salmon	Gear type	0.4%	0.0%	0.3%	0.0%	0.2%	0.0%	0.3%
	Resource	33.3%	0.0%	66.7%	0.0%	66.7%	0.0%	100.0%
	Total	0.1%	0.0%	0.2%	0.0%	0.2%	0.0%	0.3%

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

Table 3-31.—Estimated harvest of salmon by gear type and resource, Chignik Lagoon, 2015.

Resource	Subsistence methods													
	Removed from commercial catch								Subsistence gear, any method		Rod and reel		Any method	
			Set gillnet		Seine		Other							
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	755.4	3,678.9	472.1	2,022.2	2,578.1	10,515.6	54.7	222.8	3,104.9	12,760.6	38.3	292.0	3,898.6	16,731.5
Chinook salmon	161.5	1,230.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.3	292.0	199.8	1,522.6
Sockeye salmon	525.5	2,138.7	331.2	1,347.8	2,496.0	10,158.7	54.7	222.8	2,881.9	11,729.3	0.0	0.0	3,407.4	13,868.0
Coho salmon	54.7	261.9	140.9	674.4	68.4	327.4	0.0	0.0	209.4	1,001.8	0.0	0.0	264.1	1,263.7
Chum salmon	6.8	32.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	32.9
Pink salmon	6.8	14.7	0.0	0.0	13.7	29.5	0.0	0.0	13.7	29.5	0.0	0.0	20.5	44.2

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

Note The harvested number of salmon is represented as individual fish harvested.

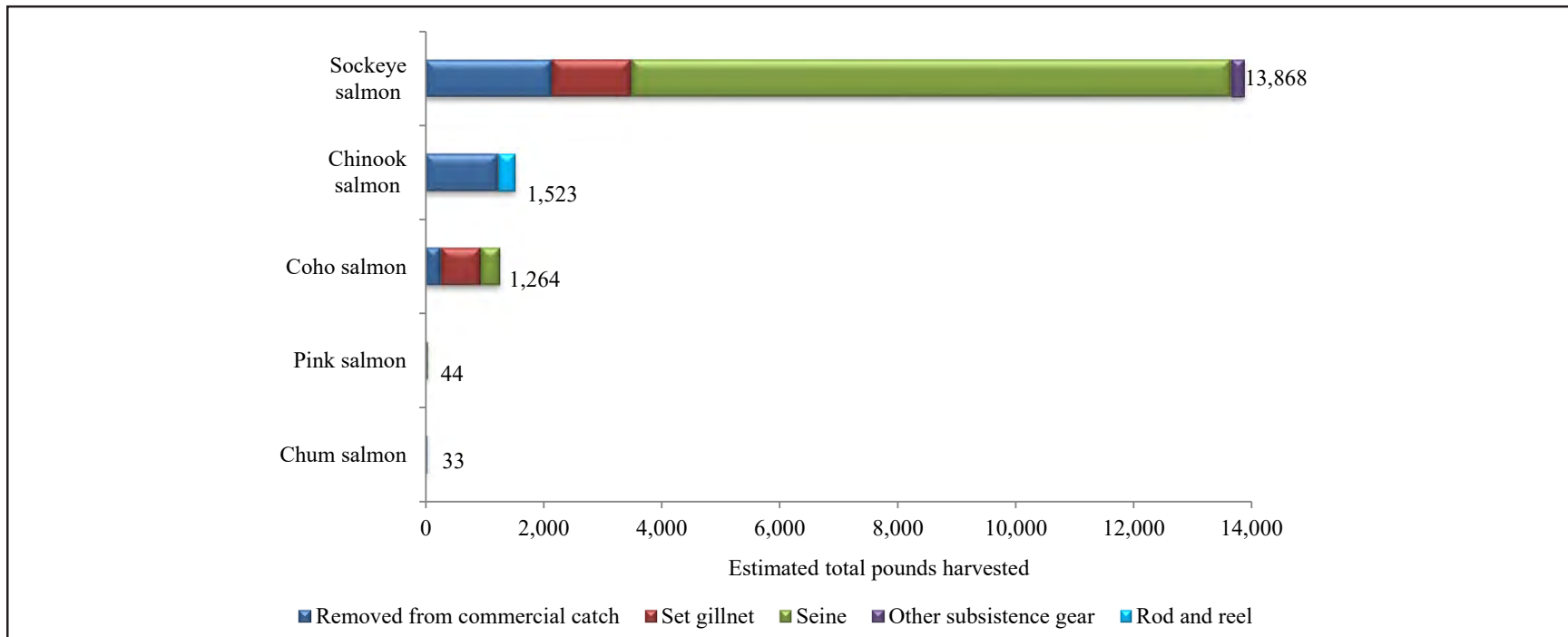


Figure 3-35.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Chignik Lagoon, 2015.

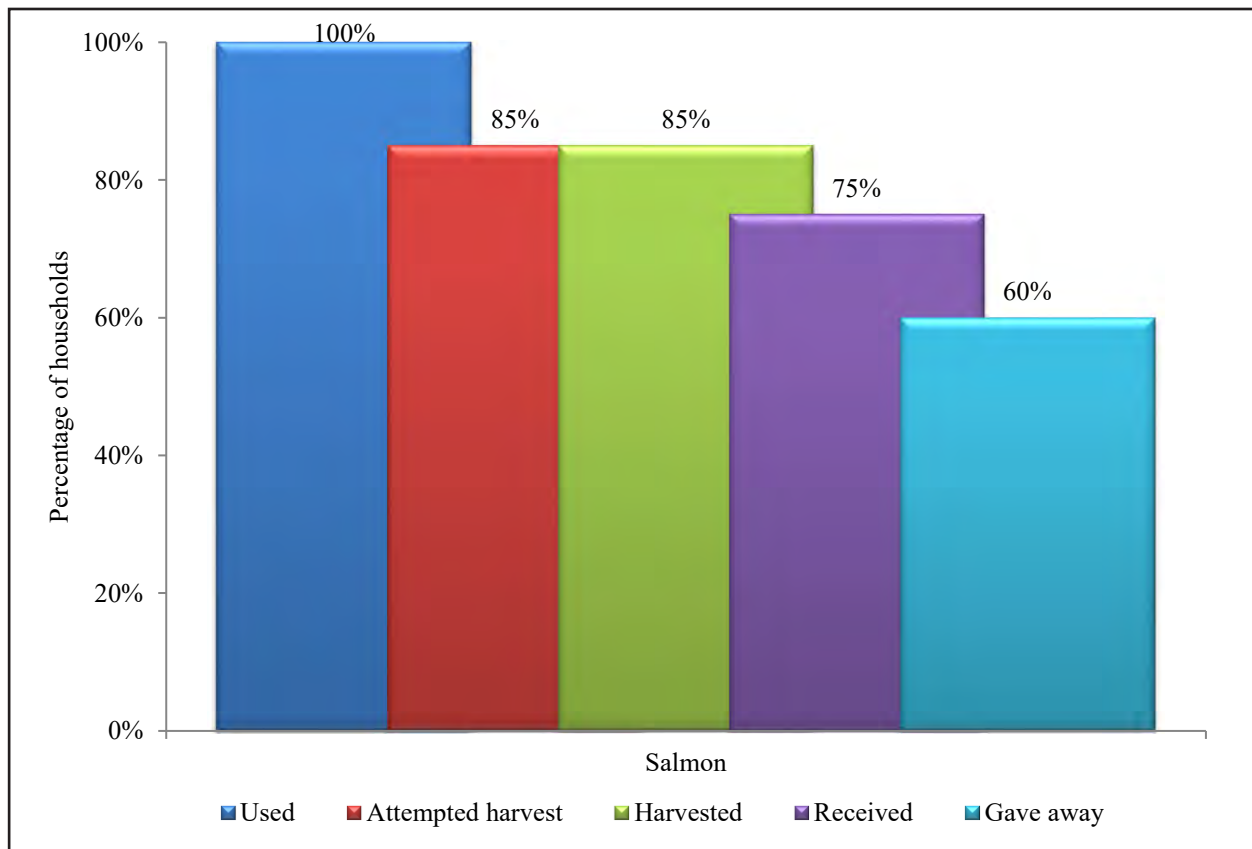


Figure 3-36.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Chignik Lagoon, 2016.

2016

Harvest, Use, and Sharing Patterns

In 2016 in Chignik Lagoon, all households used salmon, an estimated 85% fished for and harvested salmon—similar to the previous year—and salmon sharing remained a strong community characteristic with 60% of households giving away, and 75% of households receiving, salmon (Figure 3-36). All five species of Pacific salmon found in Alaska were used, harvested, and shared (except chum salmon were not shared) by Chignik Lagoon households in 2016 (Table 3-32). Similar to the previous study years, sockeye salmon was the most used, harvested, and shared species: every household (100%) used sockeye salmon, 85% of households both attempted to harvest and harvested this species, and sockeye salmon were shared and received by 60% of households. Chinook salmon, the second most used and harvested salmon species, were used by 65% of Chignik Lagoon households, and 55% of households both attempted to harvest and harvested, 20% received, and 25% gave away Chinook salmon. An estimated 30% of all households used, 25% attempted to harvest and harvested, 5% received, and 15% gave away coho salmon. Pink and chum salmon were used the least: 10% of households used and harvested pink salmon and one-half as many (5%) gave away pink salmon, and 5% used and harvested chum salmon in 2016, but no households shared this species.

Harvest Quantities and Composition

In 2016, a total of 2,609 salmon (11,602 lb) were harvested by Chignik Lagoon residents. This equated to an average harvest of 100 salmon (446 lb) per household and 37 salmon (162 lb) per capita. Sockeye

salmon represented 79% (9,109 lb; 2,078 fish) of the total salmon harvest, which equated to 80 fish (350 lb) harvested per household and 29 fish (127 lb) harvested per capita (Figure 3-37; Table 3-32). Chinook salmon represented 9% (1,003 lb; 185 fish) of the community harvest of salmon by weight; that harvest was 7 fish (39 lb) harvested per household. Coho salmon harvested represented 5% (619 lb; 118 fish) of all the salmon harvest weight; the coho salmon harvest equated to an average household harvest of 5 fish (24 lb). Chum salmon represented 4% of the weight of all species of salmon harvested with 98 fish (491 lb) harvested, which was an estimated household average harvest of 4 fish (19 lb). Pink salmon was the least harvested species and represented 3% of the total salmon harvest weight with 130 fish (380 lb) harvested in Chignik Lagoon, which equated to an average of 5 fish (15 lb) per household harvested in 2016.

Harvests by Gear Type

In 2016 in Chignik Lagoon, household survey results estimated that 58% of all the salmon harvest weight harvested for home use was caught by subsistence methods (19% by gillnet; 39% by seine), 39% by removal from commercial harvests, and 3% by rod and reel (Table 3-33). Most (62%) of the sockeye salmon harvest weight was caught by subsistence gear (22% by set gillnet; 40% by seine). Chinook salmon harvested for home use were primarily removed from commercial harvests (76% of Chinook salmon harvest weight); 20% of the Chinook salmon harvest weight was caught by rod and reel and 4% by subsistence seine. Coho salmon were also mostly obtained by removal from commercial catches (68% of harvest weight). The remainder of the coho salmon harvest weight was caught by subsistence gear (21% by set gillnet; 11% by seine). All of the chum and pink salmon harvests were caught by subsistence net: the chum salmon harvest was caught by seine (100%), and the pink salmon harvest was caught by both set gillnet (25%) and seine (75%).

The 2016 harvests of all salmon species, by pounds and number of salmon harvested by gear type, by Chignik Lagoon households are depicted in Table 3-34. Most salmon (1,554 fish) were harvested with subsistence gear: 508 salmon (2,202 lb) were harvested by set gillnet and 1,045 salmon (4,521 lb) by seine. In addition, 991 total salmon (4,561 lb) were removed from commercial harvests and 64 fish (319 lb) were harvested using rod and reel. Note that all species were harvested by seine, but only sockeye, coho, and pink salmon were harvested by set gillnet.

Sockeye salmon, like total salmon, were primarily harvested with subsistence gear: there were 451 fish (1,978 lb) harvested by set gillnet and 831 fish (3,642 lb) harvested by seine. An estimated 770 sockeye salmon (3,377 lb) were also obtained from commercial catches and 26 fish (114 lb) caught by rod and reel. Most Chinook and coho salmon harvested in 2016 by Chignik Lagoon residents were removed from commercial harvests: 140 Chinook salmon (763 lb) and 81 coho salmon (422 lb) (Figure 3-38; Table 3-34). Most of the rest of the Chinook and coho salmon harvested were caught by rod and reel (38 Chinook salmon; 205 lb) or set gillnet (28 coho salmon; 129 lb).

Table 3-32.—Estimated uses and harvests of salmon, Chignik Lagoon, 2016.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±)
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	harvest
Salmon	100.0	85.0	85.0	75.0	60.0	11,602.3	446.2	162.3	2,608.5	ind	100.3	23.5
Chinook salmon	65.0	55.0	55.0	20.0	25.0	1,003.2	38.6	14.0	184.6	ind	7.1	31.6
Sockeye salmon	100.0	85.0	85.0	60.0	60.0	9,109.4	350.4	127.4	2,078.1	ind	79.9	21.5
Coho salmon	30.0	25.0	25.0	5.0	15.0	619.1	23.8	8.7	118.3	ind	4.6	67.4
Chum salmon	5.0	5.0	5.0	0.0	0.0	490.6	18.9	6.9	97.5	ind	3.8	100.5
Pink salmon	10.0	10.0	10.0	0.0	5.0	380.1	14.6	5.3	130.0	ind	5.0	78.2
Unknown salmon	15.0	0.0	0.0	15.0	10.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2017.

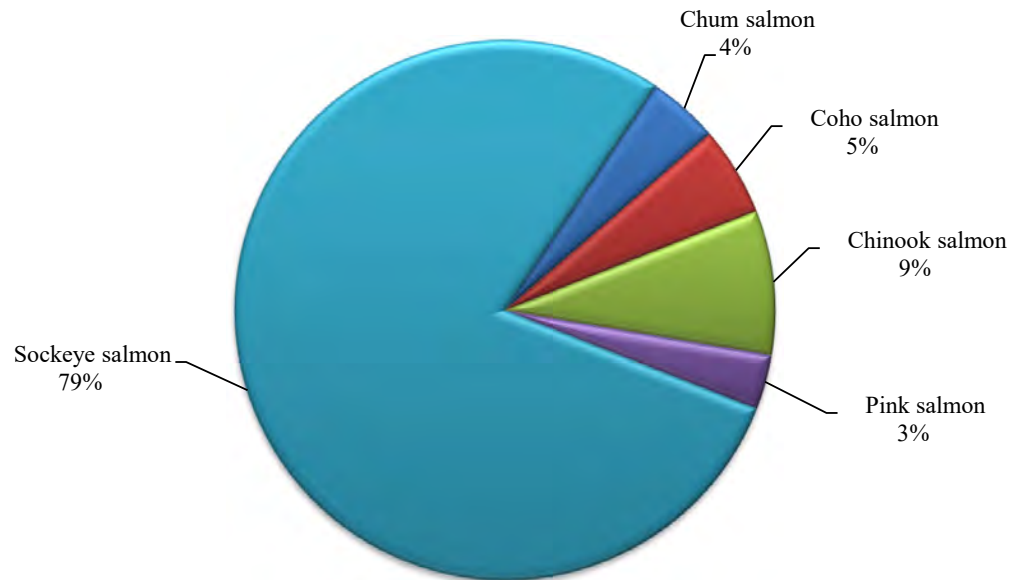


Figure 3-37.—Composition of salmon harvest in pounds usable weight, Chignik Lagoon, 2016.

Table 3-33.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Chignik Lagoon, 2016.

Resource	Percentage base	Removed from commercial catch	Subsistence methods				Subsistence gear, any method		
			Set gillnet	Drift gillnet	Seine	Other	Rod and reel	Any method	
Salmon	Gear type	100.0%	100.0%	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%
	Resource	39.3%	19.0%	0.0%	39.0%	0.0%	57.9%	2.7%	100.0%
	Total	39.3%	19.0%	0.0%	39.0%	0.0%	57.9%	2.7%	100.0%
Chinook salmon	Gear type	16.7%	0.0%	0.0%	0.8%	0.0%	0.5%	64.3%	8.6%
	Resource	76.1%	0.0%	0.0%	3.5%	0.0%	3.5%	20.4%	100.0%
	Total	6.6%	0.0%	0.0%	0.3%	0.0%	0.3%	1.8%	8.6%
Sockeye salmon	Gear type	74.0%	89.8%	0.0%	80.6%	0.0%	83.6%	35.7%	78.5%
	Resource	37.1%	21.7%	0.0%	40.0%	0.0%	61.7%	1.3%	100.0%
	Total	29.1%	17.0%	0.0%	31.4%	0.0%	48.4%	1.0%	78.5%
Coho salmon	Gear type	9.2%	5.9%	0.0%	1.5%	0.0%	2.9%	0.0%	5.3%
	Resource	68.1%	20.9%	0.0%	11.0%	0.0%	31.9%	0.0%	100.0%
	Total	3.6%	1.1%	0.0%	0.6%	0.0%	1.7%	0.0%	5.3%
Chum salmon	Gear type	0.0%	0.0%	0.0%	10.9%	0.0%	7.3%	0.0%	4.2%
	Resource	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	4.2%	0.0%	4.2%	0.0%	4.2%
Pink salmon	Gear type	0.0%	4.3%	0.0%	6.3%	0.0%	5.7%	0.0%	3.3%
	Resource	0.0%	25.0%	0.0%	75.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.8%	0.0%	2.5%	0.0%	3.3%	0.0%	3.3%

Source ADF&G Division of Subsistence household surveys, 2017.

Note Only for study year 2016 did harvest estimates distinguish between set and drift gillnet use.

Table 3-34.—Estimated harvest of salmon by gear type and resource, Chignik Lagoon, 2016.

Resource	Subsistence methods															
	Removed from commercial catch		Subsistence methods				Subsistence gear, any method				Rod and reel		Any method			
	Number	Pounds	Set gillnet	Drift gillnet	Seine	Other	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	991.3	4,561.2	508.3	2,201.7	0.0	0.0	1,045.2	4,520.5	0.0	0.0	1,553.5	6,722.2	63.7	318.8	2,608.5	11,602.3
Chinook salmon	140.4	763.0	0.0	0.0	0.0	0.0	6.5	35.3	0.0	0.0	6.5	35.3	37.7	204.9	184.6	1,003.2
Sockeye salmon	770.3	3,376.5	451.1	1,977.5	0.0	0.0	830.7	3,641.5	0.0	0.0	1,281.8	5,618.9	26.0	114.0	2,078.1	9,109.4
Coho salmon	80.6	421.8	24.7	129.3	0.0	0.0	13.0	68.0	0.0	0.0	37.7	197.3	0.0	0.0	118.3	619.1
Chum salmon	0.0	0.0	0.0	0.0	0.0	0.0	97.5	490.6	0.0	0.0	97.5	490.6	0.0	0.0	97.5	490.6
Pink salmon	0.0	0.0	32.5	95.0	0.0	0.0	97.5	285.1	0.0	0.0	130.0	380.1	0.0	0.0	130.0	380.1

Source ADF&G Division of Subsistence household surveys, 2017.

Note The harvested number of salmon is represented as individual fish harvested.

Note Only for study year 2016 did harvest estimates distinguish between set and drift gillnet use.

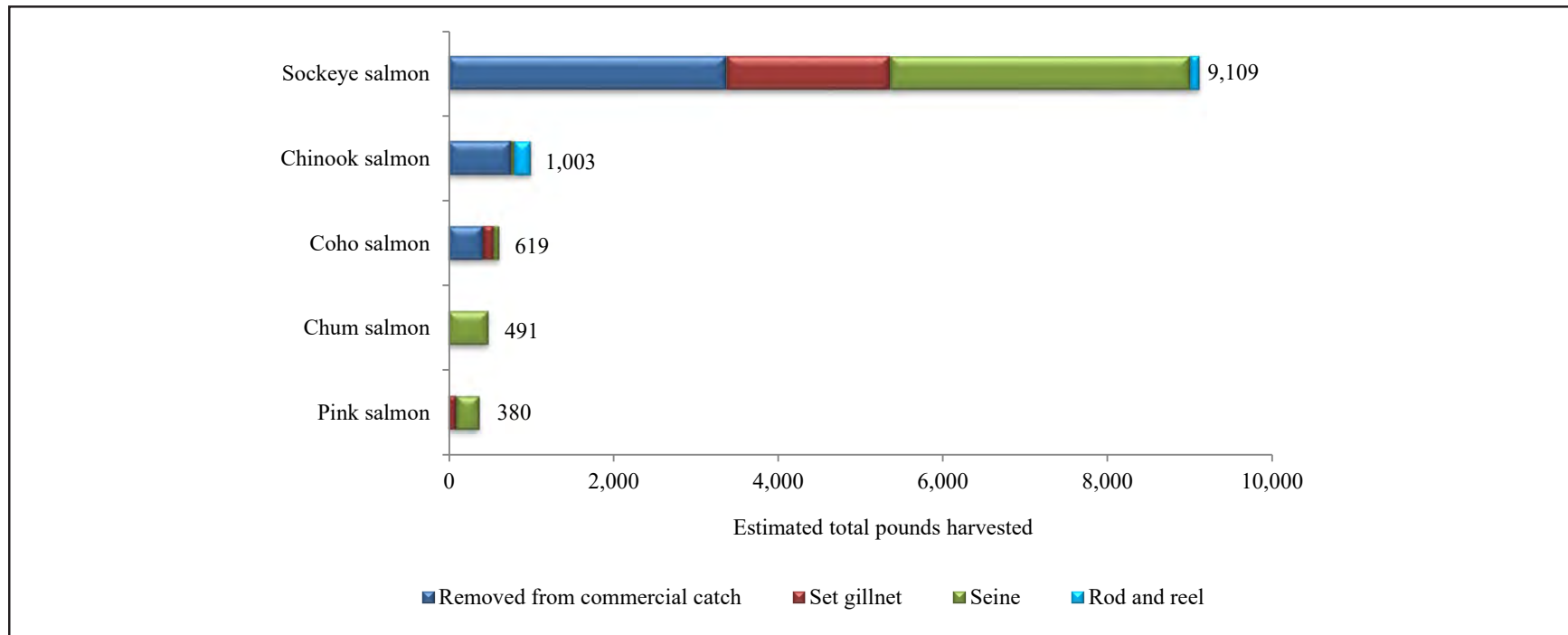


Figure 3-38.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Chignik Lagoon, 2016.

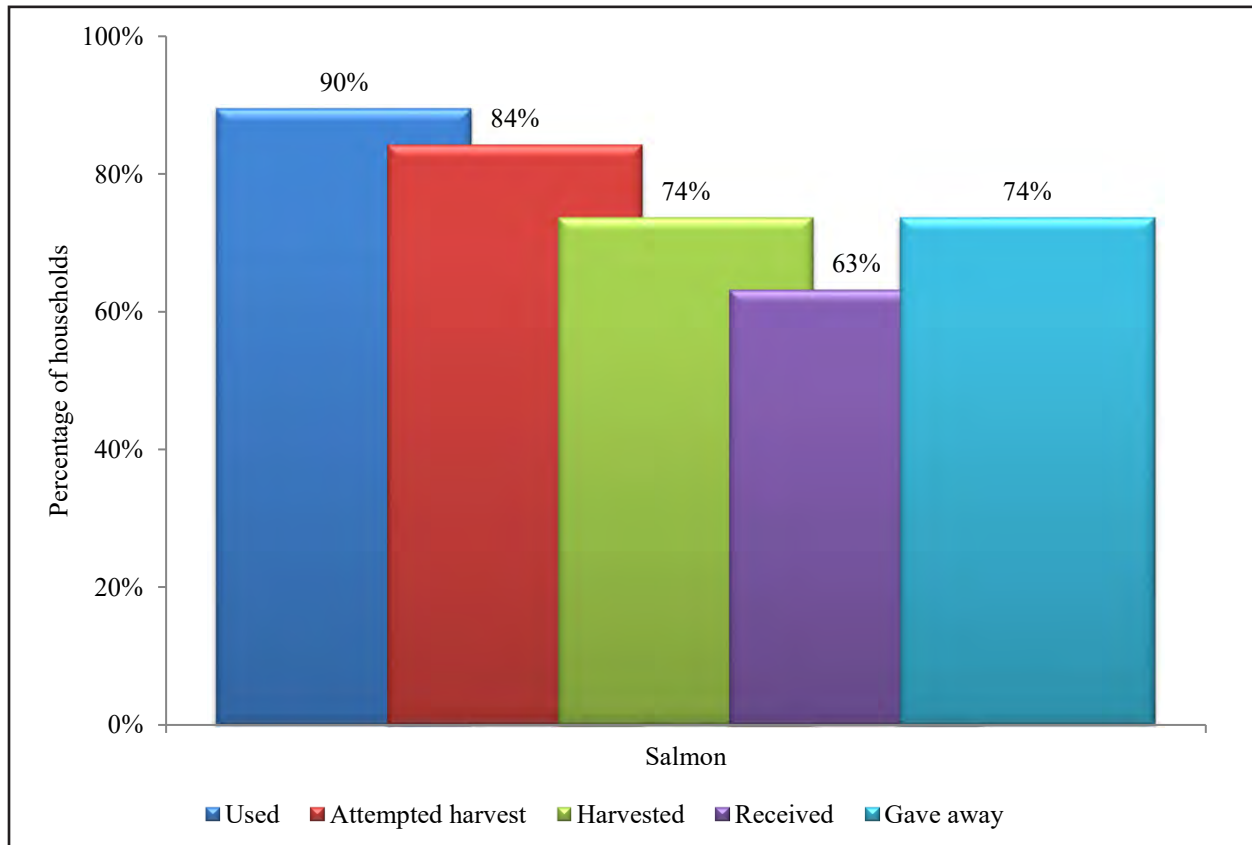


Figure 3-39.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Chignik Lake, 2014.

Chignik Lake

2014

Harvest, Use, and Sharing Patterns

In 2014, 90% of households in Chignik Lake used salmon, 84% of households attempted to harvest salmon, 74% harvested salmon, 63% received salmon, and 74% gave away salmon (Figure 3-39). All five species of Pacific salmon found in Alaska was used, harvested, and shared (except chum salmon were not shared) by Chignik Lake households in 2014 (Table 3-35). Sockeye salmon was the most used and shared species in 2014 when 90% of all households used, 79% attempted to harvest, 74% harvested, 58% received, and 74% gave away sockeye salmon. Chinook salmon was the second most used salmon species, although by significantly fewer households than sockeye salmon: an estimated 26% of households used, 32% attempted to harvest, 21% harvested, 11% received, and 11% gave away Chinook salmon. Slightly fewer households used coho salmon than Chinook salmon but the same proportion of households harvested both species; an estimated 21% of households used, 26% attempted to harvest, 21% harvested, 11% received, and 21% gave away coho salmon in 2014. Pink salmon were used by 16% of households and the same percentage harvested pink salmon; chum salmon were used and harvested the least—by only 5% of households.

Harvest Quantities and Composition

In 2014, a total of 4,158 salmon (20,668 lb) were harvested by Chignik Lake residents. This equated to an average harvest of 160 salmon (795 lb) per household and 55 salmon (275 lb) per capita. Sockeye salmon

represented 96% (19,867 lb; 4,020 fish) of Chignik Lake's total salmon harvest weight; this harvest equated to 764 lb (155 fish) harvested per household, with a per capita harvest of 237 lb (53 sockeye salmon) (Figure 3-40; Table 3-35). Although more households used Chinook salmon than coho salmon, coho salmon was Chignik Lake's second most harvested salmon species and represented 3% of the community harvest by weight; the coho salmon harvest totaled 685 lb (111 fish), which equated to an average household harvest of 26 lb (4 fish) and a per capita harvest of 9 lb. Chinook salmon represented 1% of the total salmon harvest weight, which contributed 3 lb per household. Both pink and chum salmon were harvested the least and each represented less than 1% of the total salmon harvest weight. Only 42 lb of pink salmon and 8 lb of chum salmon were harvested by Chignik Lake residents in 2014.

Harvests by Gear Type

In 2014, based on household surveys, an estimated 96% of all salmon harvest weight caught by Chignik Lake residents was harvested with subsistence gear: 55% by gillnet, 37% by seine, and 8% by other methods (i.e., handline, spear, dip net); additionally, the remaining 1% of the harvest weight was removed from commercial catches (Table 3-36). Of note, no harvests occurred using rod and reel. For the sockeye salmon harvest weight, with the exception of less than 1% being removed from commercial harvests, all of the sockeye salmon catch was harvested with subsistence gear: 55% by gillnet, 37% by seine, and 8% by other subsistence methods. Coho salmon were harvested entirely using subsistence gear, predominantly by set gillnet. The Chinook salmon harvest was mostly caught using subsistence gillnet (83%), and the remainder of the harvest weight was retained from commercial catches. All of the 2014 pink and chum salmon harvests were obtained using subsistence gear: specifically, 85% by gillnet and 15% by seine for pink salmon, and 100% by gillnet for chum salmon.

The 2014 harvests of all salmon species, by number of salmon and pounds harvested by gear type, are depicted in Table 3-37. Most salmon (4,136 fish; 20,556 lb) were harvested with subsistence gear. More specifically, 2,284 fish (11,356 lb) were harvested by gillnet, 1,526 fish (7,585 lb) by seine, and 326 fish (1,615 lb) were harvested by other subsistence means. In addition, 22 total salmon, or 112 lb, were removed from commercial harvests. Note that most of the salmon harvested by other subsistence methods and commercial removals were sockeye salmon (Figure 3-41). Sockeye salmon were primarily taken by subsistence gillnet (2,192 fish; 20,835 lb), followed by subsistence seine (1,482 fish; 7,325 lb) and other subsistence methods (325 fish; 1,606 lb), with a total of 3,999 fish (19,766 lb) harvested by subsistence gear; also, 21 fish (101 lb) were removed from commercial catches (Table 3-37). Most Chinook salmon (seven fish) were harvested by Chignik Lake households in 2014 by subsistence gillnet, too, and one fish was removed from a commercial harvest. All coho, pink, and chum salmon were harvested by subsistence gear, and, similarly to sockeye and Chinook salmon, more of the harvest for each species was caught by subsistence set gillnet than subsistence seine.

Table 3-35.—Estimated uses and harvests of salmon, Chignik Lake, 2014.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Salmon	89.5	84.2	73.7	63.2	73.7	20,668.1	794.9	274.6	4,157.9 ind		159.9	30.2
Chinook salmon	26.3	31.6	21.1	10.5	10.5	65.5	2.5	0.9	8.2 ind		0.3	53.1
Sockeye salmon	89.5	78.9	73.7	57.9	73.7	19,867.3	764.1	264.0	4,019.7 ind		154.6	30.3
Coho salmon	21.1	26.3	21.1	10.5	21.1	684.9	26.3	9.1	110.8 ind		4.3	65.8
Chum salmon	5.3	5.3	5.3	0.0	0.0	8.4	0.3	0.1	1.4 ind		0.1	109.0
Pink salmon	15.8	15.8	15.8	0.0	10.5	42.0	1.6	0.6	17.8 ind		0.7	84.5
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0

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

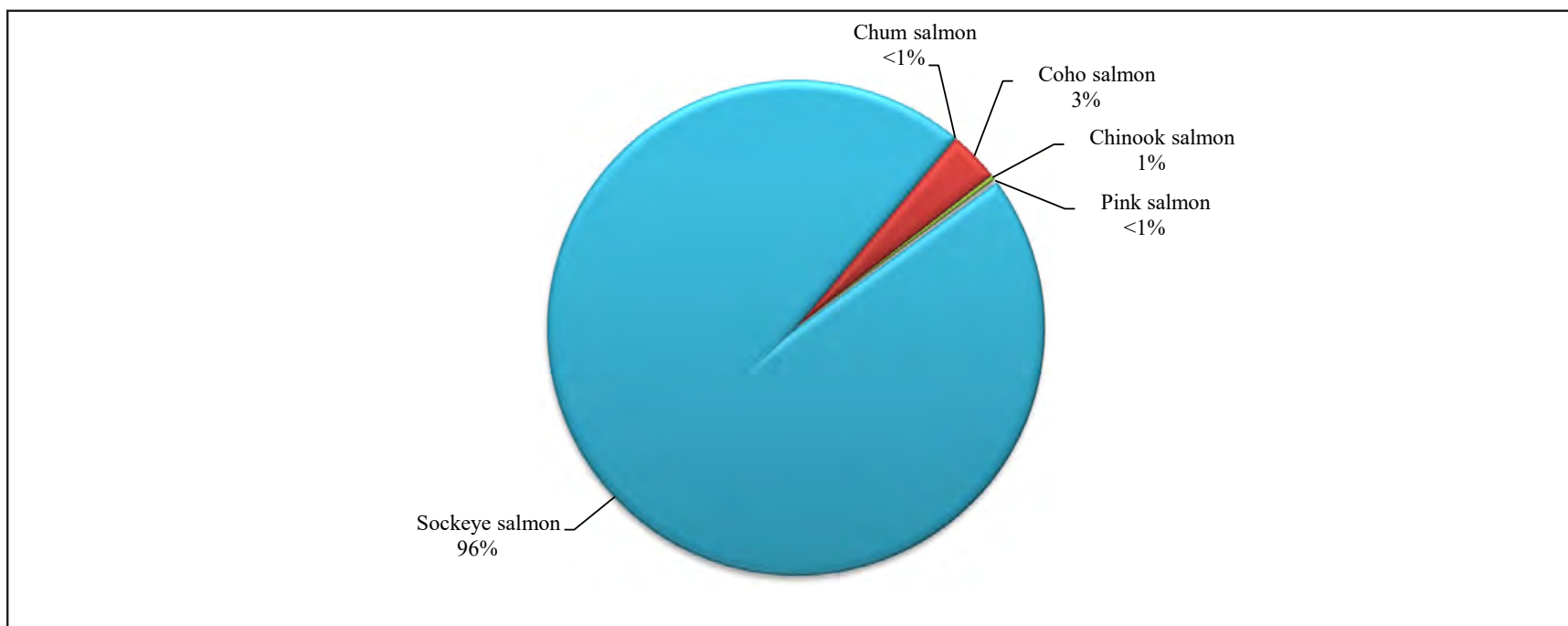


Figure 3-40.—Composition of salmon harvest in pounds usable weight, Chignik Lake, 2014.

Table 3-36.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Chignik Lake, 2014.

Resource	Percentage base	Removed from commercial catch	Subsistence methods					
			Set gillnet	Seine	Other	Subsistence gear, any method	Rod and reel	Any method
Salmon	Gear type	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%
	Resource	0.5%	54.9%	36.7%	7.8%	99.5%	0.0%	100.0%
	Total	0.5%	54.9%	36.7%	7.8%	99.5%	0.0%	100.0%
Chinook salmon	Gear type	9.7%	0.5%	0.0%	0.0%	0.3%	0.0%	0.3%
	Resource	16.7%	83.3%	0.0%	0.0%	83.3%	0.0%	100.0%
	Total	0.1%	0.3%	0.0%	0.0%	0.3%	0.0%	0.3%
Sockeye salmon	Gear type	90.3%	95.4%	96.6%	99.5%	96.2%	0.0%	96.1%
	Resource	0.5%	54.5%	36.9%	8.1%	99.5%	0.0%	100.0%
	Total	0.5%	52.4%	35.4%	7.8%	95.6%	0.0%	96.1%
Coho salmon	Gear type	0.0%	3.7%	3.3%	0.5%	3.3%	0.0%	3.3%
	Resource	0.0%	61.7%	37.0%	1.2%	100.0%	0.0%	100.0%
	Total	0.0%	2.0%	1.2%	0.0%	3.3%	0.0%	3.3%
Chum salmon	Gear type	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	100.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pink salmon	Gear type	0.0%	0.3%	0.1%	0.0%	0.2%	0.0%	0.2%
	Resource	0.0%	84.6%	15.4%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%	0.2%

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

Table 3-37.—Estimated harvest of salmon by gear type and resource, Chignik Lake, 2014.

Resource	Subsistence methods													
	Removed from commercial catch								Subsistence gear, any method		Rod and reel		Any method	
			Set gillnet		Seine		Other							
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	21.9	112.4	2,283.9	11,356.2	1,525.8	7,584.8	326.4	1,614.7	4,136.1	20,555.7	0.0	0.0	4,157.9	20,668.1
Chinook salmon	1.4	10.9	6.8	54.5	0.0	0.0	0.0	0.0	6.8	54.5	0.0	0.0	8.2	65.5
Sockeye salmon	20.5	101.4	2,192.2	10,834.9	1,482.0	7,324.7	325.0	1,606.3	3,999.2	19,765.8	0.0	0.0	4,019.7	19,867.3
Coho salmon	0.0	0.0	68.4	422.8	41.1	253.7	1.4	8.5	110.8	684.9	0.0	0.0	110.8	684.9
Chum salmon	0.0	0.0	1.4	8.4	0.0	0.0	0.0	0.0	1.4	8.4	0.0	0.0	1.4	8.4
Pink salmon	0.0	0.0	15.1	35.6	2.7	6.5	0.0	0.0	17.8	42.0	0.0	0.0	17.8	42.0

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

Note The harvested number of salmon is represented as individual fish harvested.

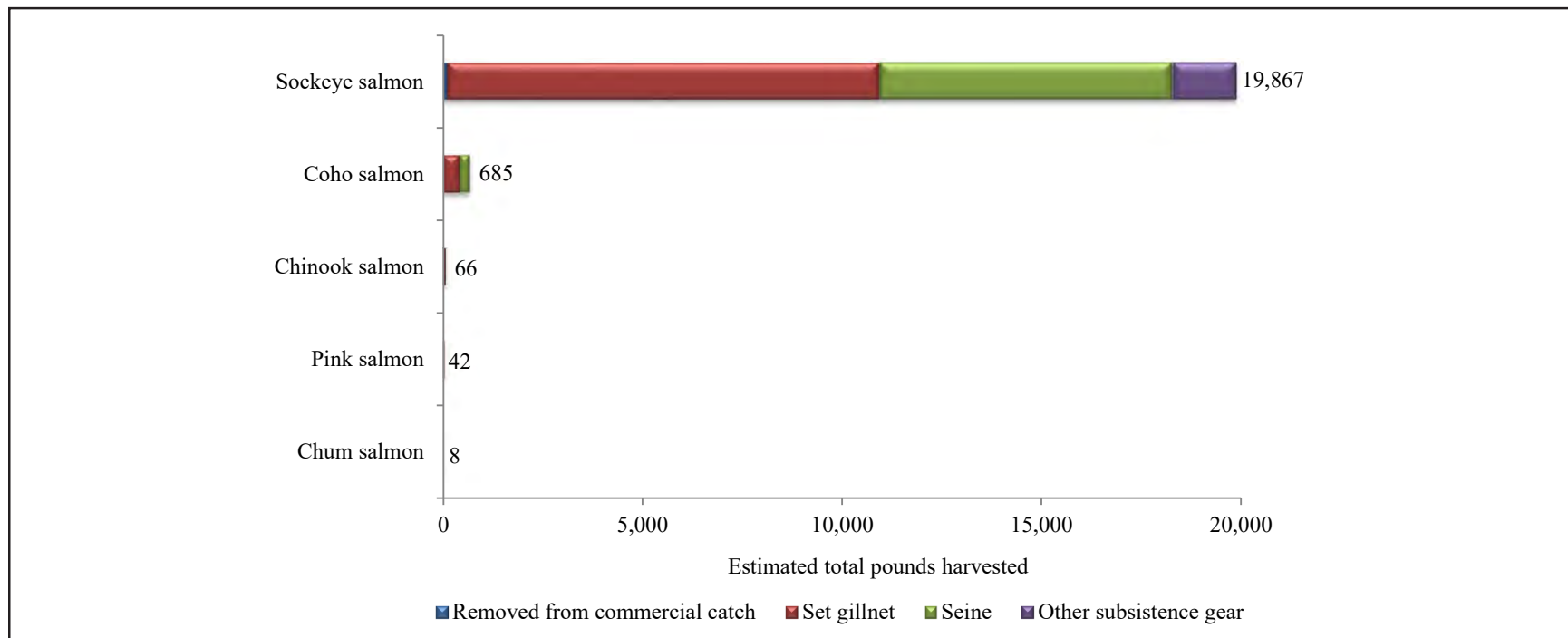


Figure 3-41.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Chignik Lake, 2014.

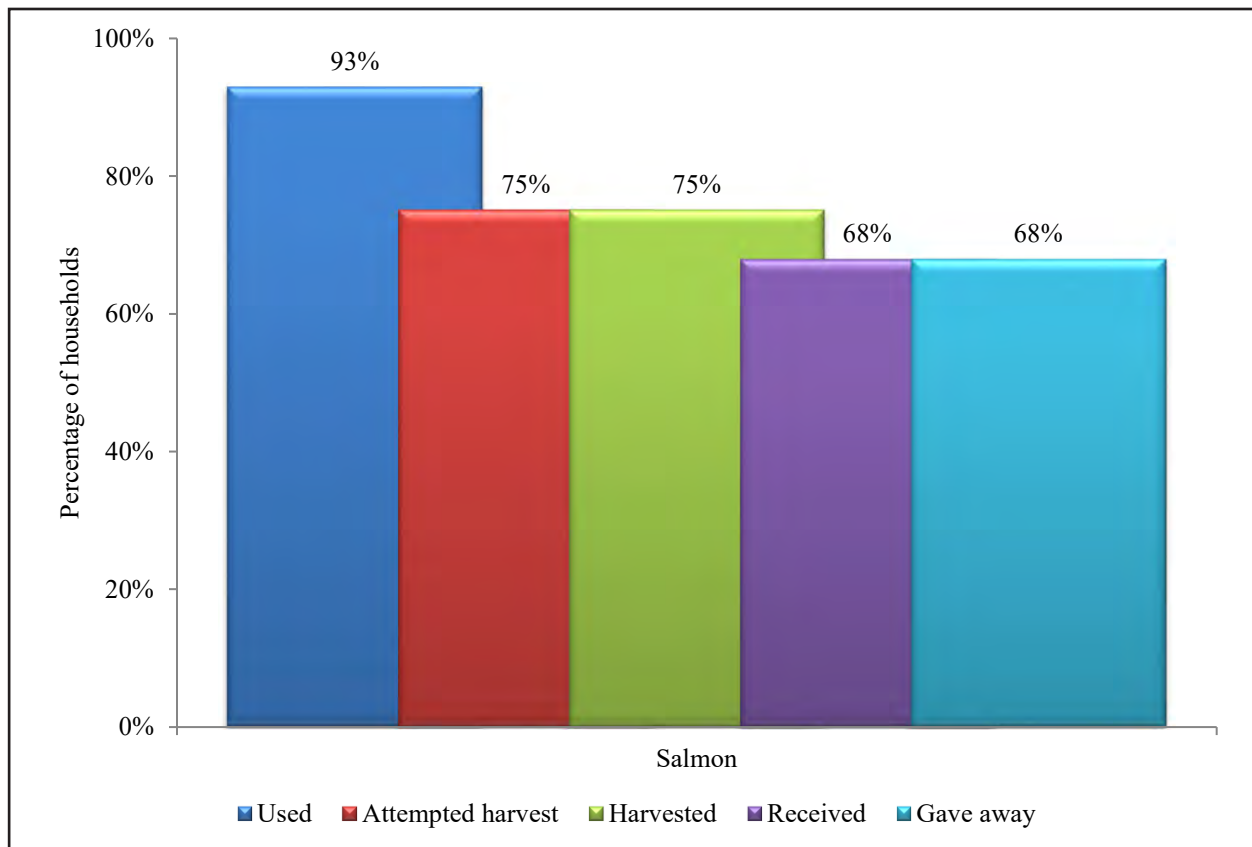


Figure 3-42.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Chignik Lake, 2015.

2015

Harvest, Use, and Sharing Patterns

In 2015, 93% of households in Chignik Lake used salmon, 75% of households attempted to harvest and harvested salmon, and 68% gave away and received salmon (Figure 3-42). All five species of Pacific salmon found in Alaska were used, harvested, and shared by Chignik Lake households in 2015 (Table 3-38). Like in 2014, sockeye salmon was the most frequently used, harvested, and shared species in 2015. An estimated 93% of all households used, 75% attempted to harvest and harvested, and 64% received and gave away sockeye salmon. Again, Chinook salmon was the second most frequently harvested and used species, and by a much smaller proportion of households compared to sockeye salmon. Chinook salmon were used by 21% of households, and 18% used pink salmon; the same proportion of Chignik Lake households fished for (14%) and harvested (11%) these species, and only for these resources were not all fishing households successful at harvesting the targeted resource. Coho salmon were used and harvested by 11% and 7% of households, respectively. The species used (7% of households) and harvested (4%) least frequently was chum salmon. While sharing—both receiving and giving away—occurred for all salmon species, fewer than 15% of households received or gave away Chinook, pink, coho, and chum salmon.

Harvest Quantities and Composition

In 2015, a total of 2,750 salmon (11,282 lb) were harvested by Chignik Lake residents. This equated to an average of 95 salmon (389 lb) harvested per household and 40 salmon (151 lb) harvested per capita. Sockeye salmon represented 92% (10,420 lb; 2,530 fish) of Chignik Lake's total salmon harvest weight

with an average of 359 lb (88 fish) of sockeye salmon harvested per household, or 140 lb (34 fish) per capita (Figure 3-43; Table 3-38). There was a total of 649 lb (136 fish) of coho salmon harvested, which equated to 22 lb (5 fish) per household and 9 lb per capita; this harvest composed 6% of the total salmon harvest weight. The Chinook salmon harvest totaled 126 lb (17 fish) and composed 1% of the overall salmon harvest weight; this harvest averaged 4 lb (1 fish) per household. Pink salmon also composed 1% of the total salmon harvest weight, and chum salmon contributed less than 1%. The pink and chum salmon harvests were 35 fish and 2 fish, respectively, which totaled 76 lb and 10 lb harvested.

Harvests by Gear Type

In 2015, an estimated 92% of the total salmon harvest weight caught by Chignik Lake residents was harvested with subsistence gear: 64% by gillnet, 20% by seine, and 8% by other methods (i.e., handline or jig) (Table 3-39). For the remaining harvest weight, 8% was removed from commercial catches, and less than 1% was harvested with rod and reel. For the sockeye salmon harvest weight, 93% was harvested using subsistence methods (63% by gillnet, 21% by seine, and 9% by other methods) and 7% was removed from commercial catches. The majority (88%) of the Chinook salmon harvest weight was obtained from commercial harvests and the rest (13%) was harvested with rod and reel. Pink salmon were also mostly retained from commercial catches (88% of harvest weight), as well as harvested with rod and reel (9% of harvest weight) and other subsistence gear (3% of harvest weight). All of the coho salmon harvest weight was caught by subsistence methods (95% by gillnet and 5% by seine), while 100% of the chum salmon harvest was obtained from commercial harvests.

In reviewing the 2015 harvest of all salmon species by number of salmon and pounds harvested by gear type, most salmon (2,519 fish; 10,347 lb) were harvested with subsistence gear: 1,752 fish (7,225 lb) by gillnet, 547 fish (2,230 lb) by seine, and 220 fish (892 lb) by other methods (Table 3-40). In addition, 226 total salmon, or 912 lb, were removed from commercial harvests for home use and 5 fish, or 23 lb, were harvested with rod and reel gear. Since sockeye salmon composed such a large proportion of the total salmon harvest, out of 2,519 fish harvested by subsistence methods, 2,382 fish were sockeye salmon; also, out of 226 fish removed from commercial harvests, 178 fish were sockeye salmon. In 2015, Chignik Lake households got most Chinook salmon from commercial removals (15 fish; 111 lb), and the remaining 2 fish (16 lb) were harvested by rod and reel. Subsistence gillnet was used to harvest the vast majority of the coho salmon harvest: 130 fish (620 lb) out of 136 fish (649 lb) (Figure 3-44). Pink salmon were harvested using a variety of gear with 31 fish (67 lb) obtained from commercial catches, 3 fish (7 lb) caught by rod and reel, and 1 fish (2 lb) harvested by subsistence gear (Table 3-40).

Table 3-38.—Estimated uses and harvests of salmon, Chignik Lake, 2015.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount		95% confidence limit (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	
Salmon	92.9	75.0	75.0	67.9	67.9	11,281.7	389.0	151.3	2,749.8 ind	94.8	13.2
Chinook salmon	21.4	14.3	10.7	14.3	7.1	126.3	4.4	1.7	16.6 ind	0.6	29.0
Sockeye salmon	92.9	75.0	75.0	64.3	64.3	10,420.4	359.3	139.7	2,560.3 ind	88.3	12.3
Coho salmon	10.7	7.1	7.1	3.6	7.1	649.2	22.4	8.7	135.7 ind	4.7	36.3
Chum salmon	7.1	3.6	3.6	3.6	3.6	10.0	0.3	0.1	2.1 ind	0.1	38.1
Pink salmon	17.9	14.3	10.7	7.1	14.3	75.8	2.6	1.0	35.2 ind	1.2	28.6
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind	0.0	0.0

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

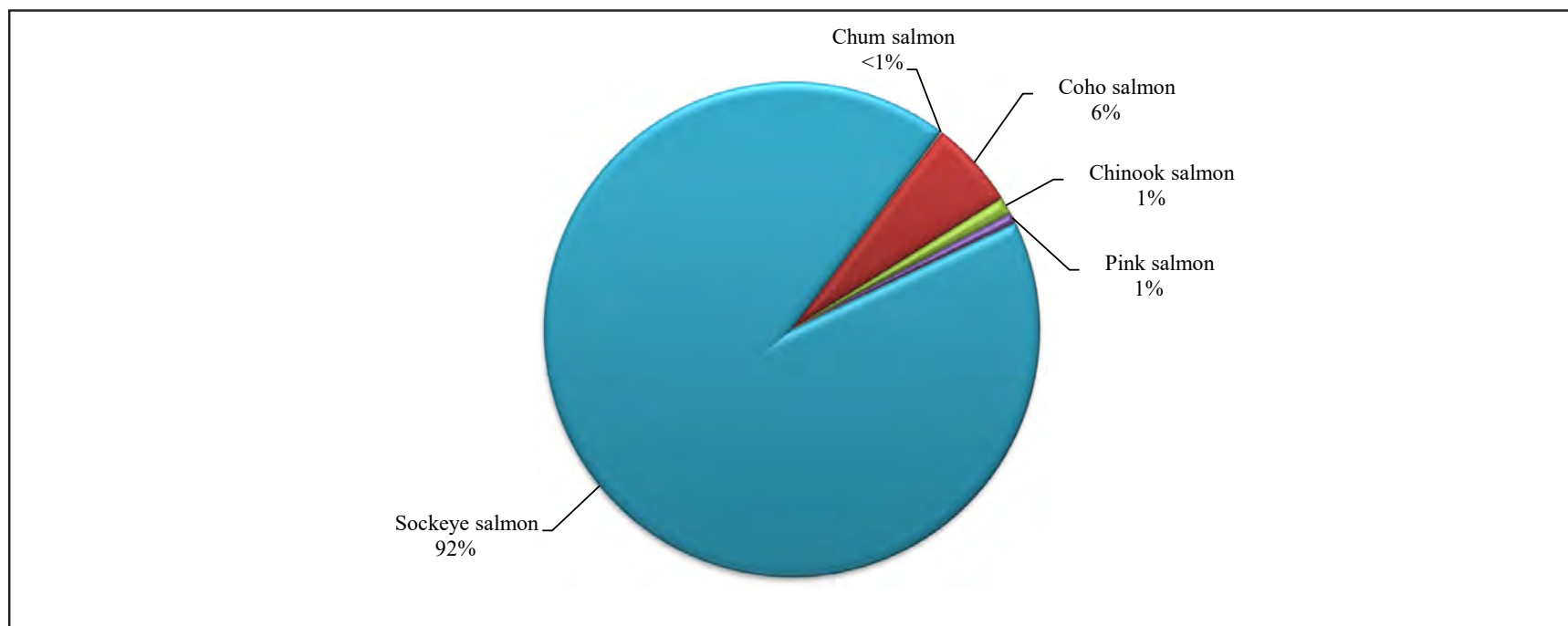


Figure 3-43.—Composition of salmon harvest in pounds usable weight, Chignik Lake, 2015.

Table 3-39.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Chignik Lake, 2015.

Resource	Percentage base	Removed from commercial catch	Subsistence methods					
			Set gillnet	Seine	Other	Subsistence gear, any method	Rod and reel	Any method
Salmon	Gear type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Resource	8.1%	64.0%	19.8%	7.9%	91.7%	0.2%	100.0%
	Total	8.1%	64.0%	19.8%	7.9%	91.7%	0.2%	100.0%
Chinook salmon	Gear type	12.1%	0.0%	0.0%	0.0%	0.0%	70.2%	1.1%
	Resource	87.5%	0.0%	0.0%	0.0%	0.0%	12.5%	100.0%
	Total	1.0%	0.0%	0.0%	0.0%	0.0%	0.1%	1.1%
Sockeye salmon	Gear type	79.5%	91.4%	98.7%	99.7%	93.7%	0.0%	92.4%
	Resource	7.0%	63.4%	21.1%	8.5%	93.0%	0.0%	100.0%
	Total	6.4%	58.6%	19.5%	7.9%	85.9%	0.0%	92.4%
Coho salmon	Gear type	0.0%	8.6%	1.3%	0.0%	6.3%	0.0%	5.8%
	Resource	0.0%	95.4%	4.6%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	5.5%	0.3%	0.0%	5.8%	0.0%	5.8%
Chum salmon	Gear type	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Pink salmon	Gear type	7.3%	0.0%	0.0%	0.3%	0.0%	29.8%	0.7%
	Resource	88.2%	0.0%	0.0%	2.9%	2.9%	8.8%	100.0%
	Total	0.6%	0.0%	0.0%	0.0%	0.0%	0.1%	0.7%

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

Table 3-40.—Estimated harvest of salmon by gear type and resource, Chignik Lake, 2015.

Resource	Subsistence methods													
	Removed from commercial catch										Subsistence gear, any method			
			Set gillnet		Seine		Other							
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	225.8	912.4	1,752.4	7,225.0	546.9	2,230.2	219.6	891.7	2,518.9	10,346.8	5.2	22.5	2,749.8	11,281.7
Chinook salmon	14.5	110.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	15.8	16.6	126.3
Sockeye salmon	178.1	725.0	1,623.0	6,605.5	540.6	2,200.4	218.5	889.4	2,382.1	9,695.3	0.0	0.0	2,560.3	10,420.4
Coho salmon	0.0	0.0	129.5	619.5	6.2	29.7	0.0	0.0	135.7	649.2	0.0	0.0	135.7	649.2
Chum salmon	2.1	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	10.0
Pink salmon	31.1	66.9	0.0	0.0	0.0	0.0	1.0	2.2	1.0	2.2	3.1	6.7	35.2	75.8

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

Note The harvested number of salmon is represented as individual fish harvested.

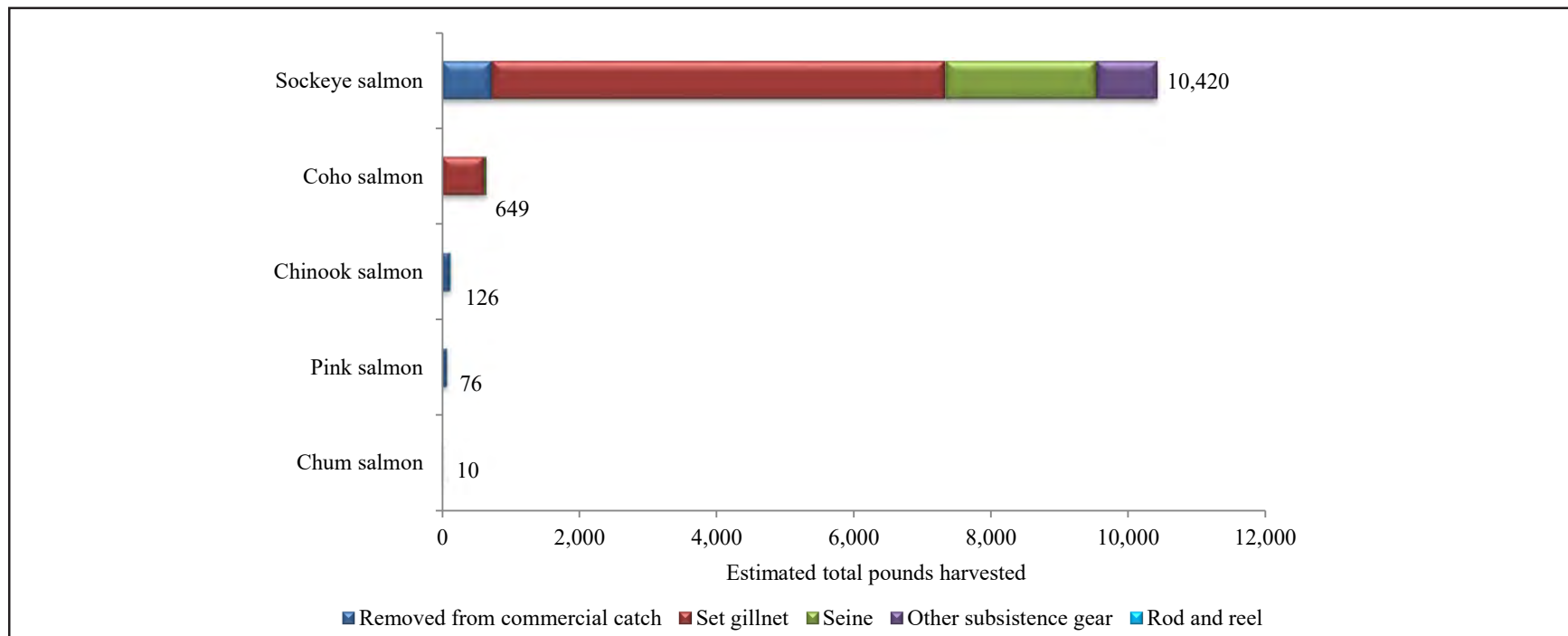


Figure 3-44.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Chignik Lake, 2015.

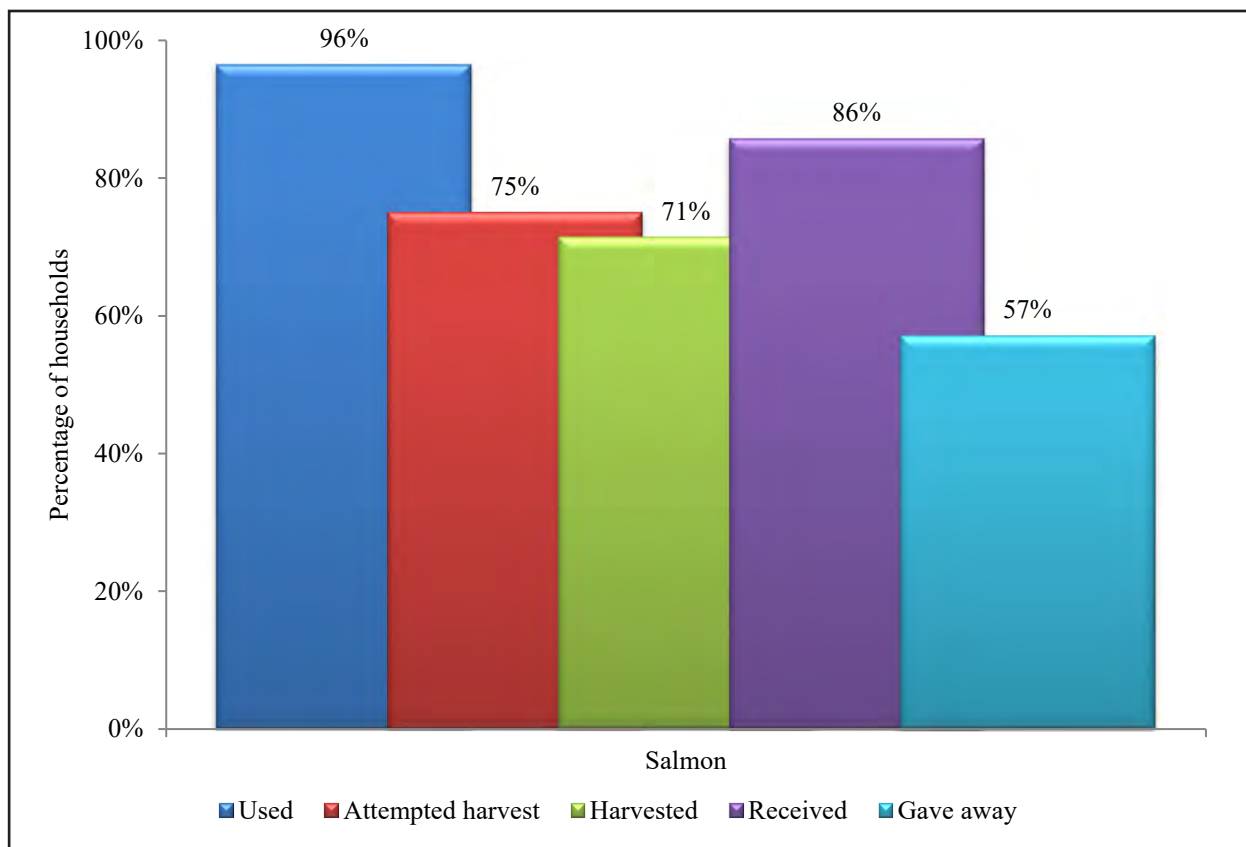


Figure 3-45.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Chignik Lake, 2016.

2016

Harvest, Use, and Sharing Patterns

An estimated 96% of households used salmon in Chignik Lake in 2016 (Figure 3-45). Three-quarters (75%) of the households fished for salmon and most were successful: an estimated 71% of Chignik Lake households. More households (86%) received salmon in 2016 compared to the two prior study years; also, the majority (57%) of households gave away salmon in 2016 (figures 3-45, 3-42, and 3-39). All five species of Pacific salmon found in Alaska were used by Chignik Lake households in 2016 (Table 3-41). As was the case in 2014 and 2015, sockeye salmon was the most used, harvested, and shared species: most households (89%) used, 75% attempted to harvest, 71% harvested, 39% received, and 54% gave away sockeye salmon. Chinook salmon was the second most harvested salmon species—although by a substantially smaller proportion of community households than harvested sockeye salmon—and more households (32%) used unknown salmon resources than used Chinook salmon. Chinook salmon were used by 21% of Chignik Lake households, 11% attempted to harvest, 7% harvested and gave away, and 14% received Chinook salmon. An estimated 14% of all households used, 4% harvested, and 11% received pink salmon, but no households gave away pink salmon. Coho and chum salmon were used the least by Chignik Lake households in 2016 out of all the salmon species (by 7% and 4% of households, respectively).

Harvest Quantities and Composition

In 2016, a total of 2,013 salmon (8,851 lb) were harvested by Chignik Lake residents. This equated to an average harvest of 61 salmon (268 lb) per household and 20 salmon (89 lb) per capita. Sockeye salmon

represented 98% (1,974 fish; 8,654 lb) of the total salmon harvest weight, which equated to 262 lb (60 fish) harvested per household and 87 lb (20 fish) harvested per capita (Figure 3-46; Table 3-41). Chinook salmon represented 2% of the community harvest of salmon by weight: an estimated harvest of 30 fish (160 lb) equated to 1 fish (5 lb) per household harvested. Chum and pink salmon each represented less than 1% of the total salmon harvest weight in 2016. There was no harvest of coho salmon; however, 7% of households received coho salmon—likely from another Chignik Lake household not interviewed or a household from another community.

Harvests by Gear Type

In 2016, based on household survey results, an estimated 91% of the total salmon harvest, in pounds usable weight, that was obtained by Chignik Lake residents for home use was harvested by subsistence methods: 59% by set gillnet, 4% by drift gillnet, 16% by seine, and 12% by other methods (i.e., handline) (Table 3-42). Also, an estimated 9% of the salmon harvest weight came from removal from commercial harvests, but no rod and reel harvests occurred. Most (93%) of the sockeye salmon harvest weight was caught by subsistence gear: 60% by set gillnet, 16% by seine, 13% by handline, and 4% by drift gillnet. Also, 7% of the sockeye salmon harvest weight was obtained from commercial harvest removals.

The harvests of the remaining species trailed the sockeye salmon harvest considerably. All of the chum salmon harvest was removed from commercial catches, all of the pink salmon harvest was caught by handline, and Chinook salmon primarily came from commercial harvest removals (80% of harvest weight). The remaining 20% of the Chinook salmon harvest weight was caught by subsistence methods (8% by set gillnet and 12% by seine).

The 2016 harvests of all salmon species, by pounds and number of salmon harvested by gear type, by Chignik Lake households are depicted in Table 3-43. Most salmon (1,841 fish; 8,069 lb) were harvested with subsistence gear: 1,185 fish (5,195 lb) by set gillnet, 83 fish (362 lb) by drift gillnet, 323 fish (1,419 lb) by seine, and 251 fish (1,094 lb) by handline. In addition, 172 salmon (782 lb) were removed from commercial harvests. As mentioned previously, more Chinook salmon were obtained from commercial harvests (24 fish; 128 lb) than harvested by subsistence methods (6 fish; 32 lb), although Chinook salmon composed only 16% of the harvest weight obtained from commercial harvests (Figure 3-47; Table 3-43 Table 3-42). In comparison to all the other study communities, Chignik Lake households had the highest harvest by subsistence handline (figures 3-29, 3-38, 3-47, and 3-50).

Table 3-41.—Estimated uses and harvests of salmon, Chignik Lake, 2016.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Salmon	96.4	75.0	71.4	85.7	57.1	8,851.4	268.2	89.4	2,013.0 ind		61.0	17.4
Chinook salmon	21.4	10.7	7.1	14.3	7.1	160.1	4.9	1.6	29.5 ind		0.9	73.5
Sockeye salmon	89.3	75.0	71.4	39.3	53.6	8,653.8	262.2	87.4	1,974.1 ind		59.8	17.2
Coho salmon	7.1	3.6	0.0	7.1	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0
Chum salmon	3.6	3.6	3.6	0.0	0.0	23.7	0.7	0.2	4.7 ind		0.1	79.9
Pink salmon	14.3	3.6	3.6	10.7	0.0	13.8	0.4	0.1	4.7 ind		0.1	79.9
Unknown salmon	32.1	0.0	0.0	32.1	25.0	0.0	0.0	0.0	0.0 ind		0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2017.

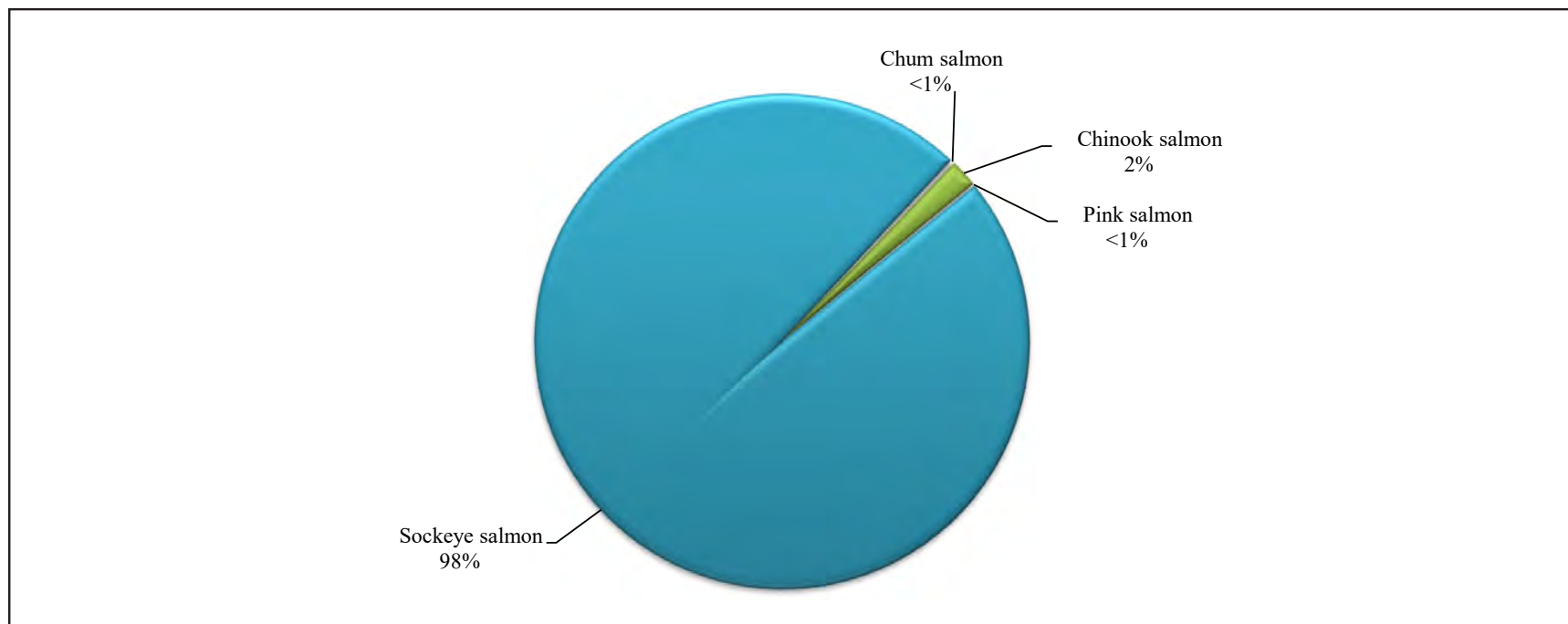


Figure 3-46.—Composition of salmon harvest in pounds usable weight, Chignik Lake, 2016.

Table 3-42.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Chignik Lake, 2016.

Resource	Percentage base	Removed from commercial catch	Subsistence methods					Rod and reel	Any method
			Set gillnet	Drift gillnet	Seine	Other	Subsistence gear, any method		
Salmon	Gear type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%
	Resource	8.8%	58.7%	4.1%	16.0%	12.4%	91.2%	0.0%	100.0%
	Total	8.8%	58.7%	4.1%	16.0%	12.4%	91.2%	0.0%	100.0%
Chinook salmon	Gear type	16.4%	0.2%	0.0%	1.4%	0.0%	0.4%	0.0%	1.8%
	Resource	80.0%	8.0%	0.0%	12.0%	0.0%	20.0%	0.0%	100.0%
	Total	1.4%	0.1%	0.0%	0.2%	0.0%	0.4%	0.0%	1.8%
Sockeye salmon	Gear type	80.6%	99.8%	100.0%	98.6%	98.7%	99.4%	0.0%	97.8%
	Resource	7.3%	59.9%	4.2%	16.2%	12.5%	92.7%	0.0%	100.0%
	Total	7.1%	58.5%	4.1%	15.8%	12.2%	90.6%	0.0%	97.8%
Coho salmon	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chum salmon	Gear type	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Pink salmon	Gear type	0.0%	0.0%	0.0%	0.0%	1.3%	0.2%	0.0%	0.2%
	Resource	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%	0.2%

Source ADF&G Division of Subsistence household surveys, 2017.

Note Only for study year 2016 did harvest estimates distinguish between set and drift gillnet use.

Table 3-43.—Estimated harvest of salmon by gear type and resource, Chignik Lake, 2016.

Resource	Subsistence methods															
	Removed from commercial catch										Subsistence gear, any method		Rod and reel		Any method	
			Set gillnet		Drift gillnet		Seine		Other							
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	172.1	782.1	1,184.5	5,194.7	82.5	361.6	322.9	1,419.3	251.0	1,093.6	1,840.9	8,069.3	0.0	0.0	2,013.0	8,851.4
Chinook salmon	23.6	128.1	2.4	12.8	0.0	0.0	3.5	19.2	0.0	0.0	5.9	32.0	0.0	0.0	29.5	160.1
Sockeye salmon	143.8	630.3	1,182.1	5,181.9	82.5	361.6	319.4	1,400.1	246.3	1,079.8	1,830.3	8,023.4	0.0	0.0	1,974.1	8,653.8
Coho salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chum salmon	4.7	23.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	23.7
Pink salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	13.8	4.7	13.8	0.0	0.0	4.7	13.8

Source ADF&G Division of Subsistence household surveys, 2017.

Note The harvested number of salmon is represented as individual fish harvested.

Note Only for study year 2016 did harvest estimates distinguish between set and drift gillnet use.

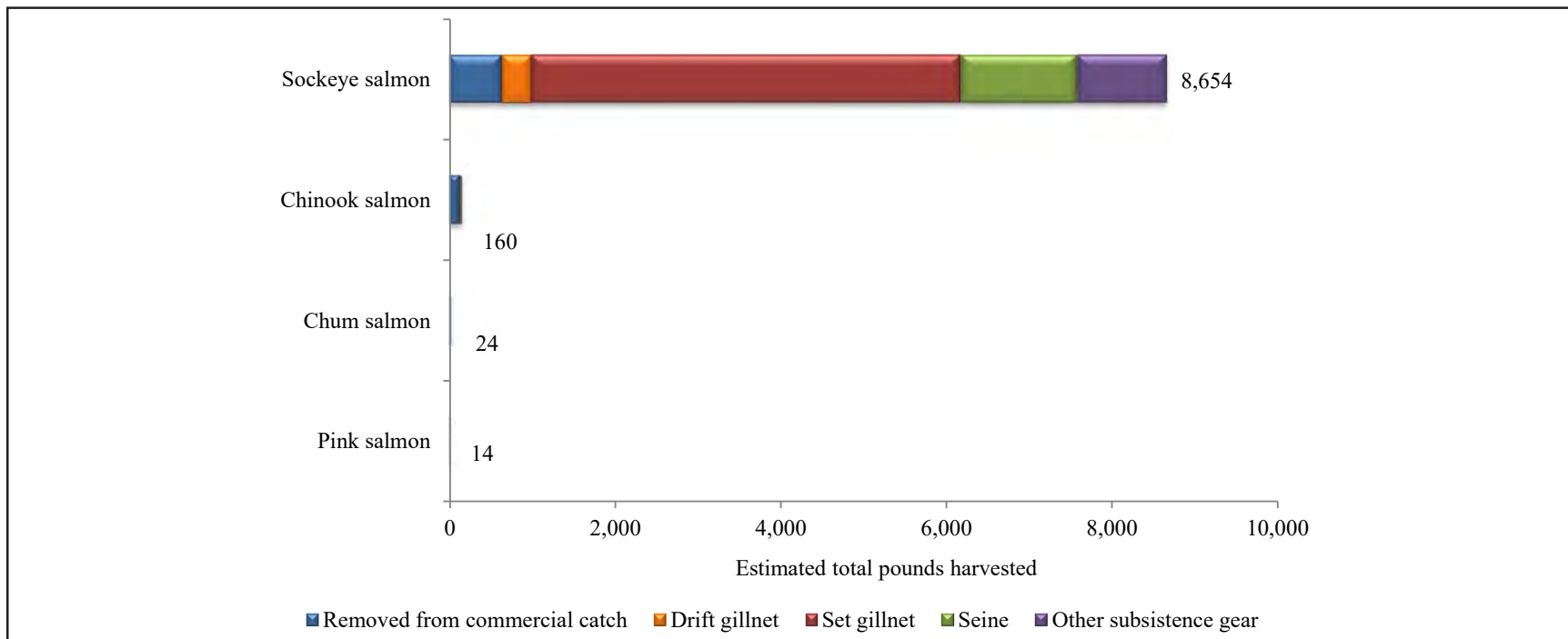


Figure 3-47.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Chignik Lake, 2016.

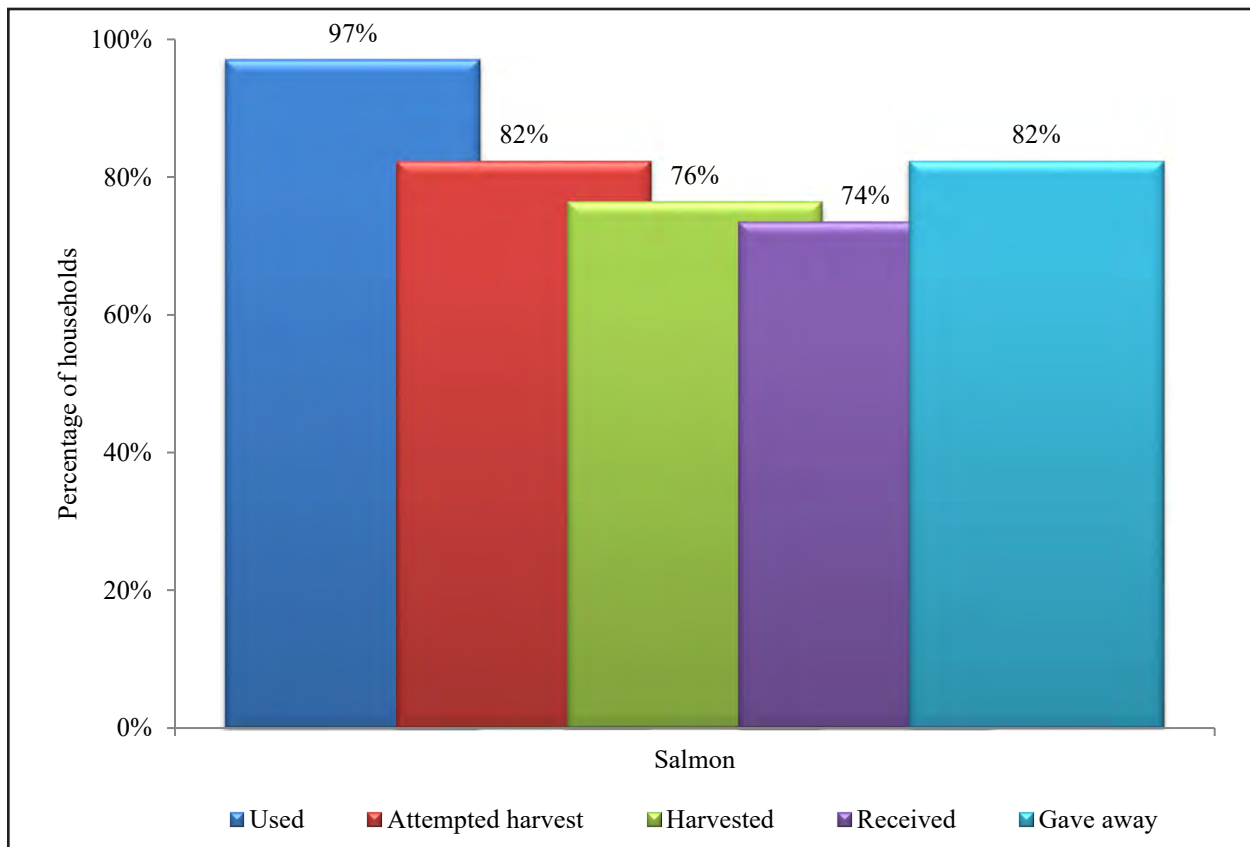


Figure 3-48.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Perryville, 2014.

Perryville

2014

Harvest, Use, and Sharing Patterns

In 2014, 97% of households in Perryville used salmon, 82% of households attempted to harvest salmon, 77% harvested salmon, 74% received salmon, and 82% of households gave away salmon (Figure 3-48). Note that this is the only year and community in which more households gave away salmon than harvested salmon. All five species of Pacific salmon found in Alaska were used, harvested, and shared by Perryville households in 2014 (Table 3-44). Sockeye salmon was the most used and shared species with most households (94%) having used this resource; also, 74% of households attempted to harvest, 74% harvested, 62% received, and 77% gave away sockeye salmon. Coho salmon was the second most harvested, used, and shared salmon species: 88% of Perryville households used, 65% attempted to harvest, 56% harvested, 56% received, and 65% gave away coho salmon. Pink salmon was used by 62% of all households, 44% attempted to harvest, 38% harvested, 41% received, and 38% gave away pink salmon. Chinook salmon was used by 59% of all households, 41% attempted to harvest, 35% harvested, 32% received, and 50% gave away Chinook salmon. Chum salmon were used the least, and 44% of households used, 35% attempted to harvest, 29% harvested, 27% received, and 32% gave away chum salmon in 2014.

Harvest Quantities and Composition

In 2014, a total of 2,878 salmon (15,514 lb) were harvested by Perryville residents. This equated to an average of 74 salmon (398 lb) harvested per household and 25 salmon (137 lb) per capita. Sockeye salmon represented one-half (7,676 lb; 1,553 fish) of the total salmon harvest weight, which equated to 197 lb (40 fish) harvested per household and 68 lb (14 fish) per capita (Figure 3-49; Table 3-44). Coho salmon composed the second largest portion (40%) of the salmon harvest weight. The coho salmon harvest of 6,276 lb (1,016 fish) equated to 161 lb (26 fish) harvested per household and 55 lb (9 fish) per capita. Chinook salmon represented 5% of the total salmon harvest weight; the harvest was 835 lb (105 fish), which equated to 21 lb (3 fish) harvested per household and 7 lb (1 fish) per capita. Chum and pink salmon represented 3% and 2% of the total salmon harvest, respectively; only 396 lb (64 fish) of chum salmon were harvested and 331 lb (140 fish) of pink salmon were harvested in Perryville in 2014. A total of 2 chum salmon (10 lb) were harvested per household and a total of 4 pink salmon (9 lb) were harvested per household by residents of Perryville.

Harvests by Gear Type

In 2014, based on household surveys, an estimated 90% of all the salmon harvest weight caught by Perryville residents for home use was harvested by subsistence methods (78% by gillnet and 12% by seine); also, 7% was obtained by removal from commercial harvests, and 3% harvested with rod and reel (Table 3-45). Most (86%) of the sockeye salmon harvest weight was caught by subsistence gear: 62% by gillnet and 24% by seine. For the remaining sockeye salmon harvest weight, 2% was caught by rod and reel and 13% by removal from commercial harvests. For coho salmon, this species was primarily harvested by subsistence gillnet (98% of harvest weight) and 2% was caught by rod and reel. An estimated 78% of all the Chinook salmon harvest weight was caught by subsistence gillnet, 12% was removed from commercial harvests, and 11% was harvested by rod and reel. Pink salmon were harvested by subsistence gillnet (92% of harvest weight) and 8% was harvested by rod and reel. For chum salmon, 79% of the harvest weight was caught by subsistence gillnet, 18% by rod and reel, and 4% by removal from commercial harvests.

In reviewing the 2014 harvest of all salmon species, by number of salmon and pounds harvested by gear, most salmon (2,587 fish; 13,991 lb) were harvested with subsistence gear: 2,217 fish (12,160 lb) by gillnet and 371 fish (1,831 lb) by seine; no other subsistence methods were used (Table 3-46). In addition, 213 fish (1,093 lb) were removed from commercial harvests and 78 fish (430 lb) were harvested using rod and reel. Sockeye salmon, like total salmon, were primarily harvested with subsistence gear: out of 1,333 fish (6,588 lb), 962 fish (4,757 lb) were harvested by gillnet and 371 fish (1,831 lb) by seine; this is the only species that was harvested by seine (Table 3-46; Figure 3-50). Sockeye salmon were also obtained from commercial catches (197 fish; 975 lb) and caught by rod and reel (23 fish; 113 lb). Coho and pink salmon were both harvested only by subsistence gillnet or rod and reel. For coho and pink salmon, an estimated 21 fish (128 lb) and 12 fish (27 lb) were caught by rod and reel, respectively; however, most fish were caught by subsistence gillnet: 995 coho salmon (6,149 lb) and 129 pink salmon (303 lb). The total Chinook salmon harvest in 2014 by Perryville residents was 80 fish (640 lb) caught by subsistence gillnet, 13 fish (103 lb) removed from commercial harvests, and 12 fish (92 lb) caught by rod and reel. Chum salmon were caught by the same methods as Chinook salmon: 51 fish (311 lb) by subsistence gillnet, 12 fish (71 lb) by rod and reel, and 2 fish (14 lb) removed from commercial harvests.

Table 3-44.—Estimated uses and harvests of salmon, Perryville, 2014.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Salmon	97.1	82.4	76.5	73.5	82.4	15,514.2	397.8	136.6	2,877.8 ind		73.8	15.5
Chinook salmon	58.8	41.2	35.3	32.4	50.0	835.0	21.4	7.4	104.7 ind		2.7	26.9
Sockeye salmon	94.1	73.5	73.5	61.8	76.5	7,676.2	196.8	67.6	1,553.1 ind		39.8	19.8
Coho salmon	88.2	64.7	55.9	55.9	64.7	6,276.4	160.9	55.3	1,015.7 ind		26.0	19.0
Chum salmon	44.1	35.3	29.4	26.5	32.4	396.1	10.2	3.5	64.2 ind		1.6	24.3
Pink salmon	61.8	44.1	38.2	41.2	38.2	330.5	8.5	2.9	139.9 ind		3.6	24.0
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0

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

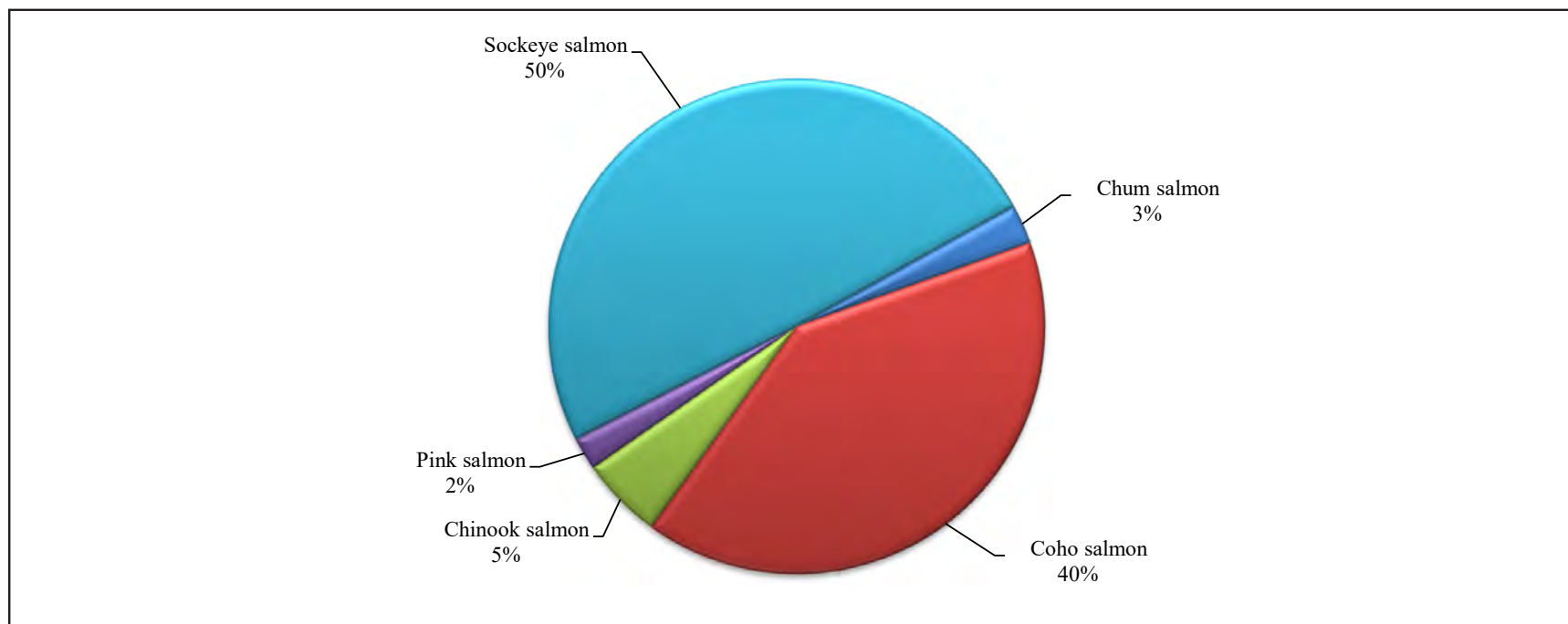


Figure 3-49.—Composition of salmon harvest in pounds usable weight, Perryville, 2014.

Table 3-45.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Perryville, 2014.

Resource	Percentage base	Removed from commercial catch	Subsistence methods			Subsistence gear, any method	Rod and reel	Any method
			Set gillnet	Seine	Other			
Salmon	Gear type	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%
	Resource	7.0%	78.4%	11.8%	0.0%	90.2%	2.8%	100.0%
	Total	7.0%	78.4%	11.8%	0.0%	90.2%	2.8%	100.0%
Chinook salmon	Gear type	9.5%	5.3%	0.0%	0.0%	4.6%	21.3%	5.4%
	Resource	12.4%	76.7%	0.0%	0.0%	76.7%	11.0%	100.0%
	Total	0.7%	4.1%	0.0%	0.0%	4.1%	0.6%	5.4%
Sockeye salmon	Gear type	89.2%	39.1%	100.0%	0.0%	47.1%	26.4%	49.5%
	Resource	12.7%	62.0%	23.9%	0.0%	85.8%	1.5%	100.0%
	Total	6.3%	30.7%	11.8%	0.0%	42.5%	0.7%	49.5%
Coho salmon	Gear type	0.0%	50.6%	0.0%	0.0%	43.9%	29.7%	40.5%
	Resource	0.0%	98.0%	0.0%	0.0%	98.0%	2.0%	100.0%
	Total	0.0%	39.6%	0.0%	0.0%	39.6%	0.8%	40.5%
Chum salmon	Gear type	1.3%	2.6%	0.0%	0.0%	2.2%	16.4%	2.6%
	Resource	3.6%	78.6%	0.0%	0.0%	78.6%	17.9%	100.0%
	Total	0.1%	2.0%	0.0%	0.0%	2.0%	0.5%	2.6%
Pink salmon	Gear type	0.0%	2.5%	0.0%	0.0%	2.2%	6.3%	2.1%
	Resource	0.0%	91.8%	0.0%	0.0%	91.8%	8.2%	100.0%
	Total	0.0%	2.0%	0.0%	0.0%	2.0%	0.2%	2.1%

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

Table 3-46.—Estimated harvest of salmon by gear type and resource, Perryville, 2014.

Resource	Subsistence methods													
	Removed from commercial catch		Subsistence gear,								Rod and reel		Any method	
			Set gillnet		Seine		Other		any method					
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	212.6	1,092.6	2,216.7	12,160.1	370.5	1,831.2	0.0	0.0	2,587.2	13,991.3	78.0	430.2	2,877.8	15,514.2
Chinook salmon	13.0	103.4	80.3	640.2	0.0	0.0	0.0	0.0	80.3	640.2	11.5	91.5	104.7	835.0
Sockeye salmon	197.3	975.1	962.4	4,756.5	370.5	1,831.2	0.0	0.0	1,332.9	6,587.7	22.9	113.4	1,553.1	7,676.2
Coho salmon	0.0	0.0	995.1	6,148.8	0.0	0.0	0.0	0.0	995.1	6,148.8	20.6	127.6	1,015.7	6,276.4
Chum salmon	2.3	14.1	50.5	311.2	0.0	0.0	0.0	0.0	50.5	311.2	11.5	70.7	64.2	396.1
Pink salmon	0.0	0.0	128.5	303.4	0.0	0.0	0.0	0.0	128.5	303.4	11.5	27.1	139.9	330.5

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

Note The harvested number of salmon is represented as individual fish harvested.

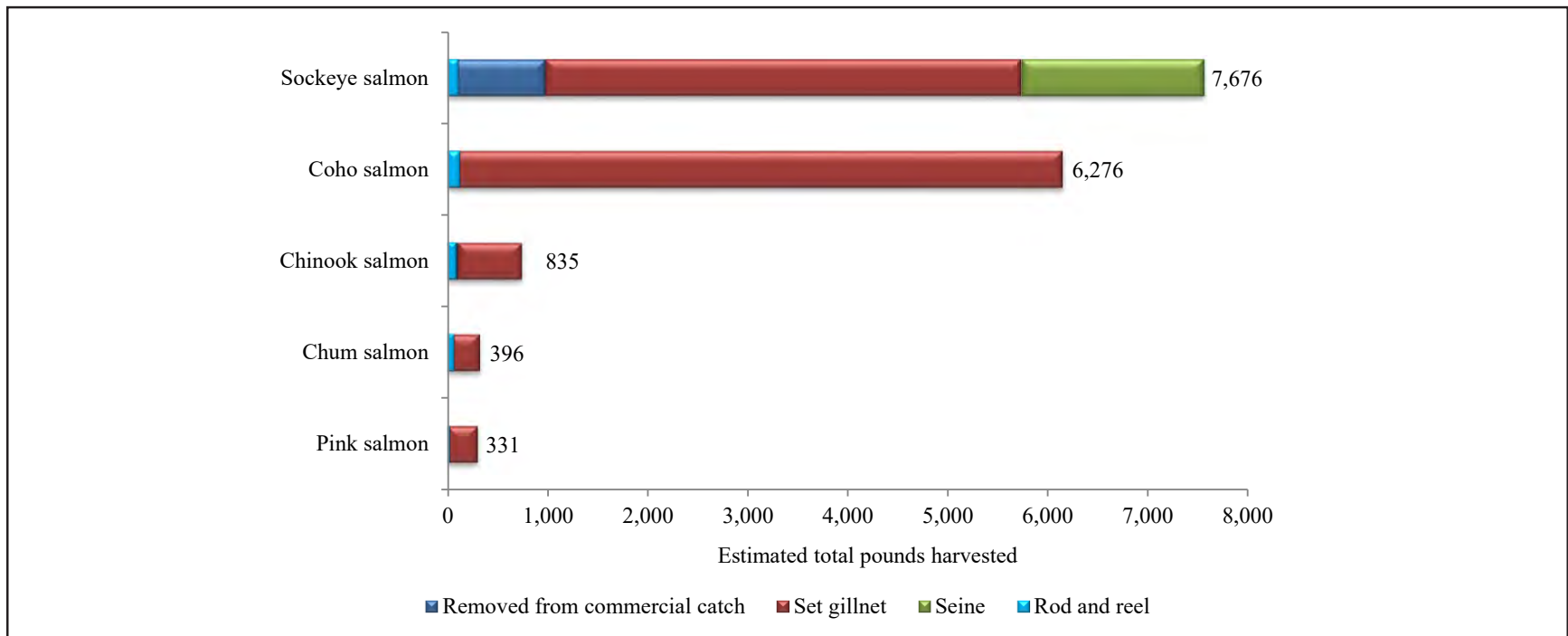


Figure 3-50.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Perryville, 2014.

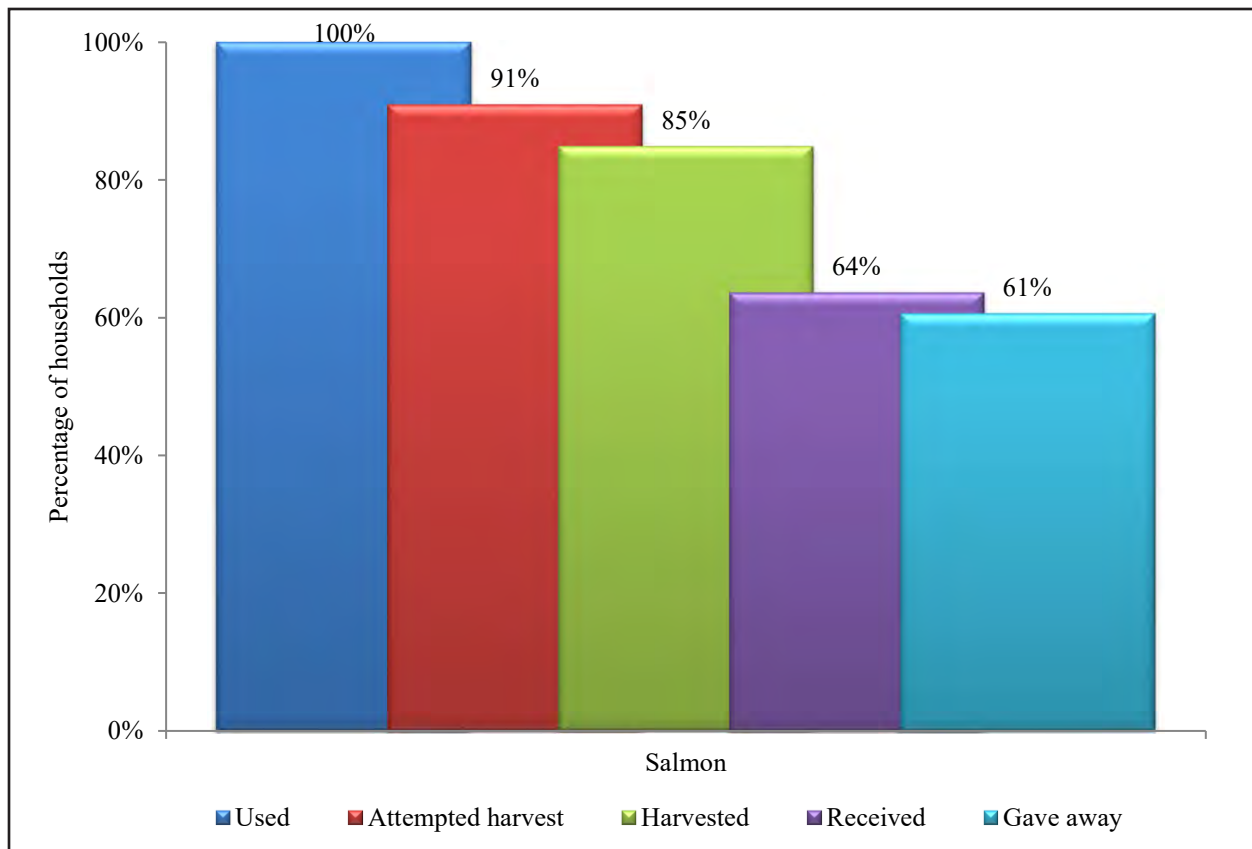


Figure 3-51.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Perryville, 2015.

2015

Harvest, Use, and Sharing Patterns

In 2015, 100% of households in Perryville used salmon, 91% of households attempted to harvest salmon, 85% harvested salmon, 64% received salmon, and 61% of households gave away salmon (Figure 3-51). All five species of Pacific salmon found in Alaska was used, harvested, and shared by Perryville households in 2015 (Table 3-47). Sockeye and coho salmon were the most used species with each used by 91% of households, but sockeye salmon was harvested and shared by more households than coho salmon. An estimated 85% of households fished for sockeye salmon and 76% of Perryville households harvested this species; also, 42% of households received sockeye salmon and 52% gave away this resource. Coho salmon were harvested and shared by almost as many households compared to sockeye salmon: an estimated 76% of households fished for coho salmon, 73% harvested this species, and 36% received and 42% gave away coho salmon. Pink salmon were used by 70% of all households, 64% attempted to harvest, 55% harvested, 21% received, and 27% gave away pink salmon. Chum and Chinook salmon were used by 42% of all households, but more households fished for and harvested chum salmon. For both species, not all fishing households were successful: 39% attempted to harvest chum salmon and 36% harvested, and 30% fished for Chinook salmon and 27% harvested. More households received (21%) than gave away (12%) Chinook salmon, but more households gave away (21%) than received (15%) chum salmon.

Harvest Quantities and Composition

In 2015, a total of 4,118 salmon (17,218 lb) were harvested by Perryville residents. This equated to an average of 106 salmon (442 lb) harvested per household and 35 salmon (146 lb) per capita. Sockeye salmon represented most (57%) of the total salmon harvest weight in Perryville in 2015 (Figure 3-52). An estimated 9,814 lb (2,411 fish) of sockeye salmon were harvested, which equated to 252 lb (62 fish) harvested per household and 83 lb (20 fish) per capita (Table 3-47). Coho salmon, which were used by as many households as sockeye salmon, represented 28% of the community harvest of salmon by weight, which is about one-half as much as the sockeye salmon harvest (Figure 3-52; Table 3-47). The coho salmon harvest of 4,882 lb (1,020 fish) equated to 125 lb (26 fish) harvested per household and 41 lb (9 fish) per capita. Chum, pink, and Chinook salmon represented 6%, 5%, and 4% of the total salmon harvest weight, respectively. With only 978 lb (203 fish) of chum salmon harvested and 842 lb (391 fish) of pink salmon harvested in the community in 2015, the per capita harvests were 8 lb and 7 lb, respectively. A total of 5 chum salmon (25 lb) and a total of 10 pink salmon (21 lb) were harvested per household. The Chinook salmon harvest of 703 lb (92 fish) equated to 18 lb (2 fish) harvested per household and 6 lb (less than 1 fish) per capita.

Harvests by Gear Type

In 2015, based on household surveys, an estimated 75% of all the salmon harvest weight caught by Perryville residents for home use was harvested by subsistence methods: 66% by gillnet and 9% by seine; no other subsistence methods, such as handline or jig, were used. (Table 3-48). For the remaining harvest weight, 8% was removed from commercial harvests and 17% was harvested with rod and reel. Most (81%) of the sockeye salmon harvest weight was caught by subsistence gear: 65% by gillnet and 16% by seine; also, 10% of the harvest weight was removed from commercial harvests, and 8% was caught by rod and reel. Coho salmon harvested for home use were primarily harvested by subsistence gillnet (76% of harvest weight) and 24% was caught by rod and reel. Approximately one-third (35%) of all Chinook salmon harvest weight was caught by subsistence gillnet, 41% was removed from commercial harvests, and 24% was harvested by rod and reel. Pink salmon were harvested by subsistence gillnet (52% of harvest weight) or rod and reel (47%), and nearly 1% was removed from commercial harvests. Chum salmon were harvested by subsistence gillnet (55% of harvest weight) or rod and reel (44%), and 1% was removed from commercial harvests.

Regarding the 2015 harvest of all salmon species by number of salmon and pounds harvested by gear, most salmon (3,083 fish; 12,906 lb) were harvested with subsistence gear: 2,693 fish (11,319 lb) by gillnet and 390 fish (1,587 lb) by seine (Table 3-49). In addition, 291 salmon (1,315 lb) were removed from commercial harvests and 745 salmon (2,997 lb) were removed from rod and reel. The sockeye salmon harvest by subsistence gear was 1,961 fish (7,981 lb), which was predominantly composed of gillnet harvests (1,571 fish; 6,394 lb) followed by seine harvests (390 fish; 1,587 lb). As was the case in 2014 in Perryville, sockeye salmon was the only species harvested by seine in 2015 (Figure 3-53). Nearly an equal number of sockeye salmon were removed from commercial catches (248 fish; 1,010 lb) and caught by rod and reel (202 fish; 823 lb) (Table 3-49). Coho salmon were harvested by residents of Perryville in 2015 more so by subsistence gillnet (774 fish; 3,704 lb) than by rod and reel (246 fish; 1,178 lb).

For each of the three remaining species, fewer than 1,000 lb usable weight were harvested (Figure 3-53). Chinook salmon is the only species for which a larger portion (38 fish; 288 lb) of the harvest was obtained by removal from commercial catches; following that method, Chinook salmon were harvested by subsistence set gillnet (32 fish; 243 lb) and rod and reel (23 fish; 171 lb) (Table 3-49). For pink and chum salmon, a total of 203 fish (438 lb) and 112 fish (540 lb) were harvested by subsistence gillnet, respectively, and 2 fish each were retained from commercial harvests. More pink salmon were harvested by rod and reel than chum salmon: 185 fish (399 lb) and 89 fish (426 lb) were harvested, respectively.

Table 3-47.—Estimated uses and harvests of salmon, Perryville, 2015.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±)
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Salmon	100.0	90.9	84.8	63.6	60.6	17,217.8	441.5	145.7	4,117.9 ind		105.6	13.7
Chinook salmon	42.4	30.3	27.3	21.2	12.1	702.5	18.0	5.9	92.2 ind		2.4	33.1
Sockeye salmon	90.9	84.8	75.8	42.4	51.5	9,813.8	251.6	83.0	2,411.2 ind		61.8	18.4
Coho salmon	90.9	75.8	72.7	36.4	42.4	4,882.0	125.2	41.3	1,020.3 ind		26.2	16.2
Chum salmon	42.4	39.4	36.4	15.2	21.2	977.7	25.1	8.3	203.3 ind		5.2	28.9
Pink salmon	69.7	63.6	57.6	21.2	27.3	841.8	21.6	7.1	390.9 ind		10.0	17.5
Unknown salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ind		0.0	0.0

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

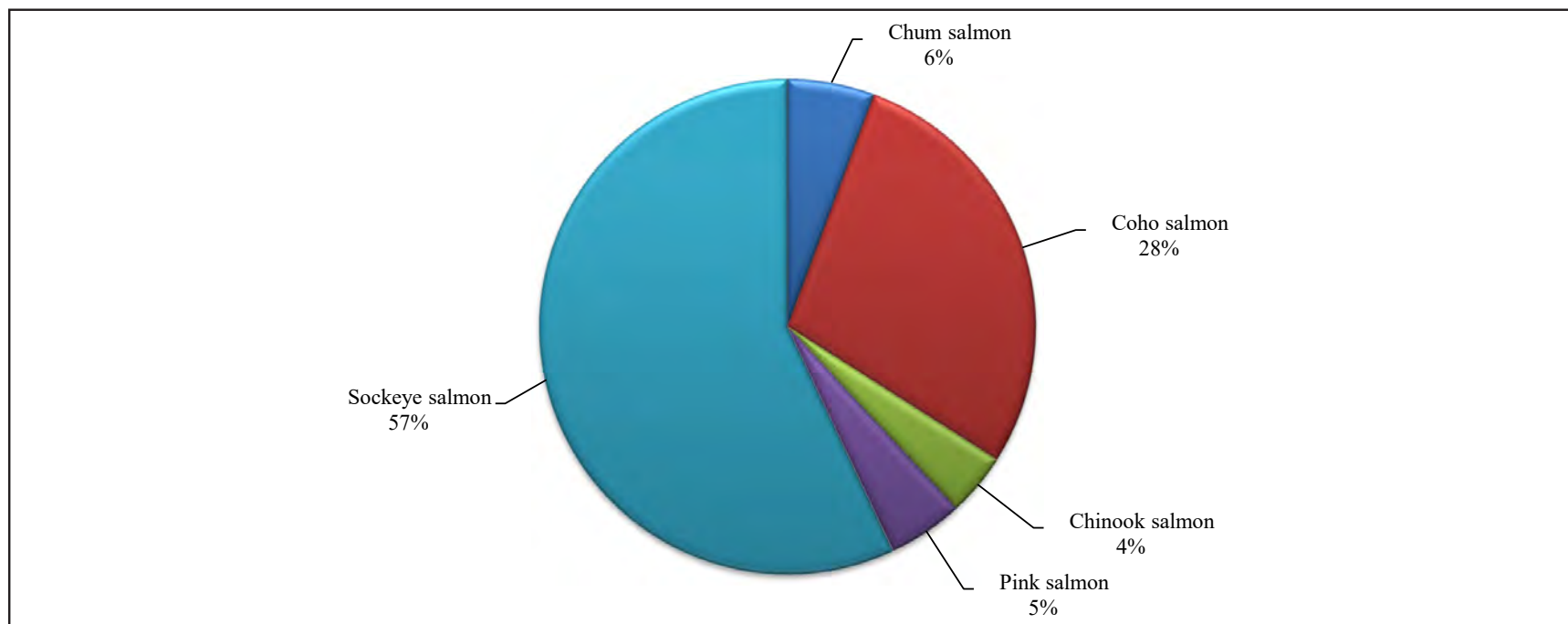


Figure 3-52.—Composition of salmon harvest in pounds usable weight, Perryville, 2015.

Table 3-48.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Perryville, 2015.

Resource	Percentage base	Removed from commercial catch	Subsistence methods					Any method
			Set gillnet	Seine	Other	Subsistence gear, any method	Rod and reel	
Salmon	Gear type	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%
	Resource	7.6%	65.7%	9.2%	0.0%	75.0%	17.4%	100.0%
	Total	7.6%	65.7%	9.2%	0.0%	75.0%	17.4%	100.0%
Chinook salmon	Gear type	21.9%	2.1%	0.0%	0.0%	1.9%	5.7%	2.2%
	Resource	41.0%	34.6%	0.0%	0.0%	34.6%	24.4%	100.0%
	Total	1.7%	1.4%	0.0%	0.0%	1.4%	1.0%	2.2%
Sockeye salmon	Gear type	76.8%	56.5%	100.0%	0.0%	61.8%	27.4%	58.6%
	Resource	10.3%	65.2%	16.2%	0.0%	81.3%	8.4%	100.0%
	Total	5.9%	37.1%	9.2%	0.0%	46.4%	4.8%	58.6%
Coho salmon	Gear type	0.0%	32.7%	0.0%	0.0%	28.7%	39.3%	24.8%
	Resource	0.0%	75.9%	0.0%	0.0%	75.9%	24.1%	100.0%
	Total	0.0%	21.5%	0.0%	0.0%	21.5%	6.8%	24.8%
Chum salmon	Gear type	0.9%	4.8%	0.0%	0.0%	4.2%	14.2%	4.9%
	Resource	1.2%	55.2%	0.0%	0.0%	55.2%	43.6%	100.0%
	Total	0.1%	3.1%	0.0%	0.0%	3.1%	2.5%	4.9%
Pink salmon	Gear type	0.4%	3.9%	0.0%	0.0%	3.4%	13.3%	9.5%
	Resource	0.6%	52.0%	0.0%	0.0%	52.0%	47.4%	100.0%
	Total	0.0%	2.5%	0.0%	0.0%	2.5%	2.3%	9.5%

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

Table 3-49.—Estimated harvest of salmon by gear type and resource, Perryville, 2015.

Resource	Subsistence methods													
	Removed from commercial catch										Subsistence gear, any method			
			Set gillnet		Seine		Other				Rod and reel		Any method	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	290.7	1,314.8	2,692.5	11,318.8	390.0	1,587.3	0.0	0.0	3,082.5	12,906.1	744.6	2,996.9	4,117.9	17,217.8
Chinook salmon	37.8	288.2	31.9	243.2	0.0	0.0	0.0	0.0	31.9	243.2	22.5	171.1	92.2	702.5
Sockeye salmon	248.2	1,010.1	1,571.0	6,393.8	390.0	1,587.3	0.0	0.0	1,961.0	7,981.1	202.1	822.5	2,411.2	9,813.8
Coho salmon	0.0	0.0	774.1	3,704.0	0.0	0.0	0.0	0.0	774.1	3,704.0	246.2	1,178.0	1,020.3	4,882.0
Chum salmon	2.4	11.4	112.3	540.0	0.0	0.0	0.0	0.0	112.3	540.0	88.6	426.3	203.3	977.7
Pink salmon	2.4	5.1	203.3	437.7	0.0	0.0	0.0	0.0	203.3	437.7	185.3	398.9	390.9	841.8

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

Note The harvested number of salmon is represented as individual fish harvested.

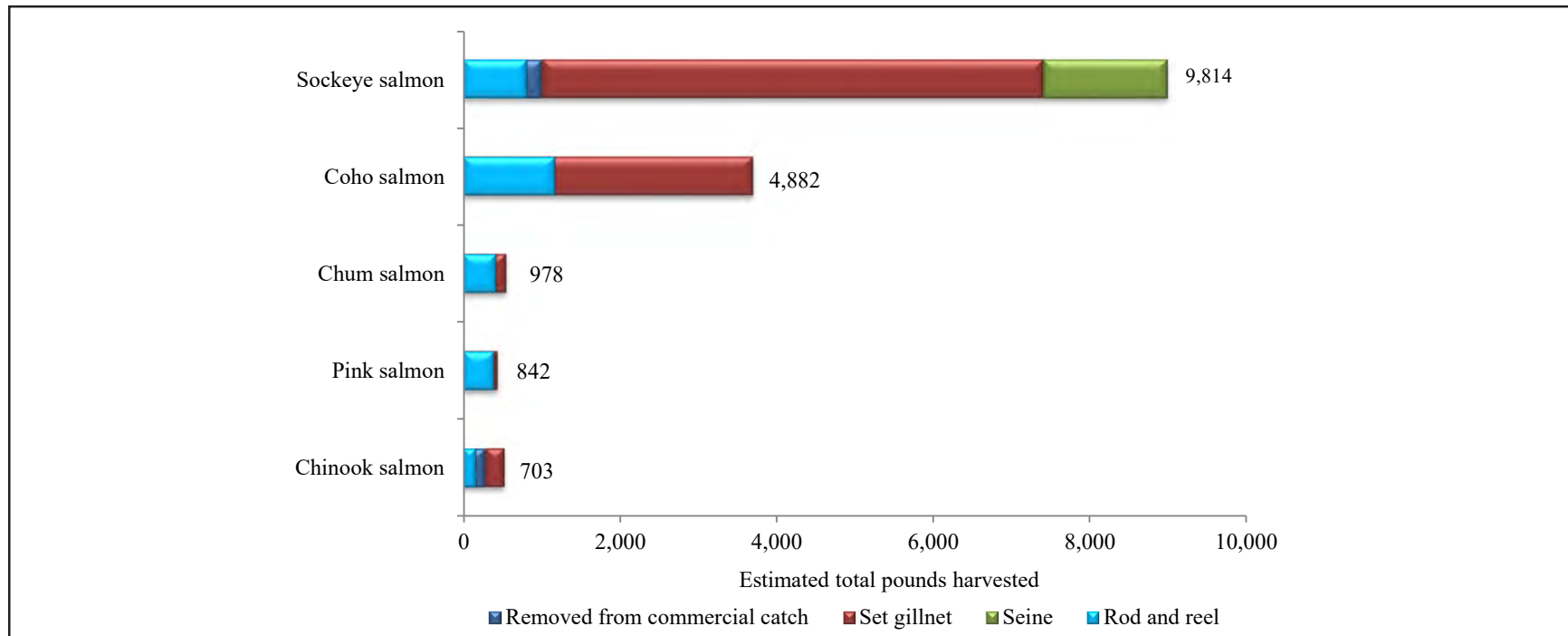


Figure 3-53.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Perryville, 2015.

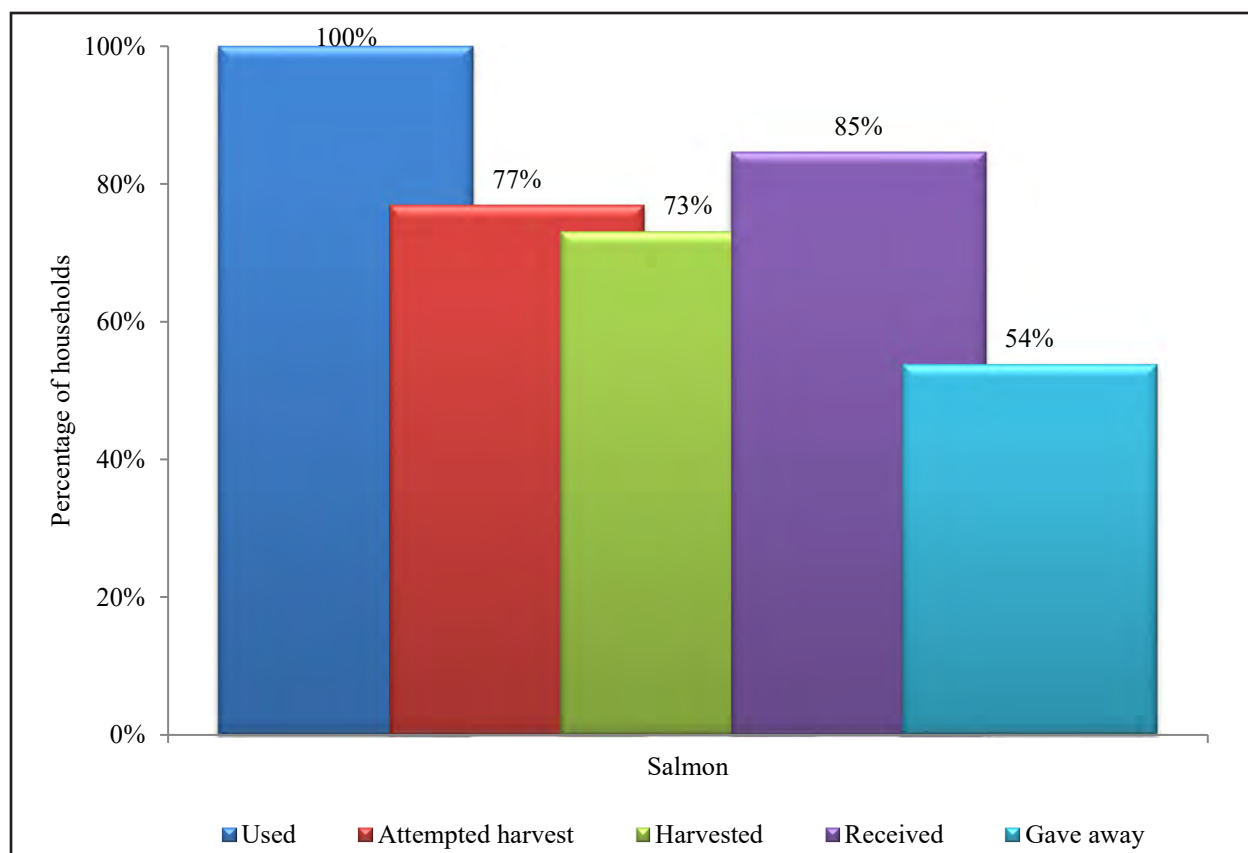


Figure 3-54.—Percentages of households that used, attempted to harvest, harvested, and shared salmon, Perryville, 2016.

2016

Harvest, Use, and Sharing Patterns

All Perryville households used salmon in 2016 (Figure 3-54). An estimated 77% of Perryville households fished for salmon, and nearly the same proportion (73%) harvested salmon. Most households (85%) received salmon, and few more than one-half (54%) of households gave away salmon. All five species of Pacific salmon found in Alaska were used, harvested, and shared by Perryville households in 2016 (Table 3-50). Similar to 2014 and 2015, sockeye salmon was the most used, harvested, and shared species: most (92%) households used, 73% attempted to harvest, 65% harvested, 58% received, and 42% gave away sockeye salmon. Coho salmon, the second most used salmon species, were used by 69% of Perryville households; also, 50% of households attempted to harvest and harvested, 35% received, and 23% gave away coho salmon. An estimated 65% of all households used pink salmon, 54% attempted to harvest, 50% harvested, 27% received, and 23% gave away pink salmon. Fewer than 50% of households used the remaining two salmon species. Chinook salmon were used, harvested, and shared the least: 27% of households used, 27% attempted to harvest, 23% harvested, and 12% of households received and gave away Chinook salmon in 2016. Overall, most households that fished were successful, although only for coho and chum salmon were all fishing households successful. Also, 19% of households received and used unknown salmon resources.

Harvest Quantities and Composition

In 2016, a total of 2,983 salmon (13,561 lb) were harvested by Perryville residents, which equated to an average of 81 salmon (367 lb) per household and 27 salmon (124 lb) per capita harvested. Sockeye

salmon represented most (62%) of the total salmon harvest weight; the sockeye salmon harvest was 1,920 fish (8,415 lb) that equated to 52 fish (227 lb) harvested per household and 18 fish (77 lb) harvested per capita (Figure 3-55; Table 3-50). Coho salmon composed one-quarter (25%) of the salmon harvest weight; an estimated harvest of 645 fish (3,374 lb) equated to 17 fish (91 lb) per household and 6 fish (31 lb) per capita harvested. Chum salmon represented 5% of the overall salmon harvest weight; an estimated harvest of 147 fish (738 lb) equated to 4 fish (20 lb) harvested per household and 1 fish (7 lb) harvested per capita. Chinook and pink salmon each represented 4% of the total salmon harvest weight; however, due to the size difference between these species, more pink salmon (177 fish) were harvested than Chinook salmon (95 fish). In Perryville, an estimated three Chinook salmon and five pink salmon were harvested per household.

Harvests by Gear Type

In 2016, household survey results estimated that 91% of salmon, in pounds usable weight, was harvested by Perryville residents for home use by subsistence methods: 73% by set gillnet, 16% by seine, and 2% by handline (Table 3-51). An additional 8% of the harvest weight was obtained by removal from commercial harvests and 1% was harvested with rod and reel. Most (95%) of the sockeye salmon harvest weight was caught by subsistence gear (69% by set gillnet; 25% by seine; and 1% by other methods—specifically handline); the remaining 5% of the sockeye salmon harvest weight was obtained by removal from commercial harvests. Sockeye salmon was the only species harvested by seine in Perryville in 2016. Coho salmon composed 51% of the harvest weight by rod and reel, and Chinook and pink salmon composed 27% and 22% of the rod and reel harvest weight, respectively.

The 2016 harvests of all salmon species, by pounds or number of salmon harvested by gear type, by Perryville households are depicted in Table 3-52. Most salmon were harvested with subsistence gear: 2,177 total salmon (9,892 lb) by set gillnet, 488 sockeye salmon (2,140 lb) by seine, and 73 total salmon (331 lb) by handline. In addition, 219 fish (1,082 lb) were removed from commercial harvests and 26 fish (116 lb) were harvested using rod and reel.

Regarding subsistence gear use, there were four species of salmon harvested using handline: coho salmon (29 fish; 149 lb), sockeye salmon (16 fish; 69 lb), chum salmon (14 fish; 72 lb), and pink salmon (14 fish; 42 lb). As mentioned previously, a large proportion of the total salmon harvest was caught by subsistence set gillnet; for every species, except Chinook salmon, subsistence gillnet accounted for the majority of the harvest weight (69%–90%) (Table 3-51). There were 1,324 sockeye salmon (5,802 lb) harvested by set gillnet, or 43% of the total salmon harvest weight (Table 3-52; Table 3-51). For the third consecutive study year, Perryville households harvested only sockeye salmon by subsistence seine (Figure 3-56). Most of the Chinook salmon caught for home use were removed from commercial harvests (70 fish; 379 lb); an additional 20 Chinook salmon (108 lb) were caught with set gillnet, and 6 Chinook salmon (31 lb) were harvested by rod and reel (Table 3-52).

Table 3-50.—Estimated uses and harvests of salmon, Perryville, 2016.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount		95% confidence limit (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	
Salmon	100.0	76.9	73.1	84.6	53.8	13,560.5	366.5	123.8	2,982.8 ind	80.6	24.2
Chinook salmon	26.9	26.9	23.1	11.5	11.5	518.1	14.0	4.7	95.3 ind	2.6	72.2
Sockeye salmon	92.3	73.1	65.4	57.7	42.3	8,415.4	227.4	76.8	1,919.7 ind	51.9	26.9
Coho salmon	69.2	50.0	50.0	34.6	23.1	3,373.5	91.2	30.8	644.7 ind	17.4	36.3
Chum salmon	42.3	26.9	26.9	19.2	15.4	737.5	19.9	6.7	146.6 ind	4.0	45.2
Pink salmon	65.4	53.8	50.0	26.9	23.1	516.0	13.9	4.7	176.5 ind	4.8	32.6
Unknown salmon	19.2	0.0	0.0	19.2	7.7	0.0	0.0	0.0	0.0 ind	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2017.

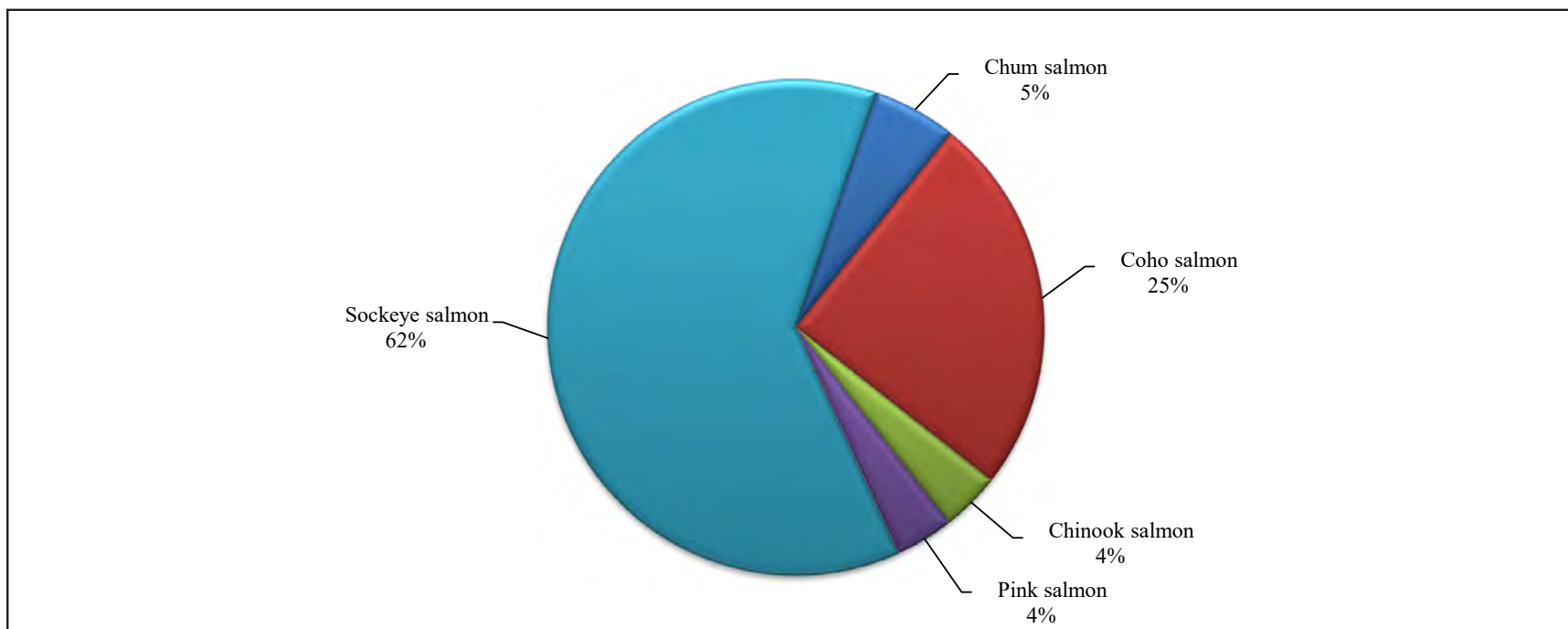


Figure 3-55.—Composition of salmon harvest in pounds usable weight, Perryville, 2016.

Table 3-51.—Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Perryville, 2016.

Resource	Percentage base	Removed from commercial catch	Subsistence methods				Subsistence gear,		
			Set gillnet	Drift gillnet	Seine	Other	any method	Rod and reel	Any method
Salmon	Gear type	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Resource	8.0%	72.9%	0.0%	15.8%	2.4%	91.2%	0.9%	100.0%
	Total	8.0%	72.9%	0.0%	15.8%	2.4%	91.2%	0.9%	100.0%
Chinook salmon	Gear type	35.0%	1.1%	0.0%	0.0%	0.0%	0.9%	26.8%	3.8%
	Resource	73.1%	20.9%	0.0%	0.0%	0.0%	20.9%	6.0%	100.0%
	Total	2.8%	0.8%	0.0%	0.0%	0.0%	0.8%	0.2%	3.8%
Sockeye salmon	Gear type	37.5%	58.6%	0.0%	100.0%	20.7%	64.8%	0.0%	62.1%
	Resource	4.8%	68.9%	0.0%	25.4%	0.8%	95.2%	0.0%	100.0%
	Total	3.0%	42.8%	0.0%	15.8%	0.5%	59.1%	0.0%	62.1%
Coho salmon	Gear type	27.5%	29.0%	0.0%	0.0%	45.0%	24.4%	51.6%	24.9%
	Resource	8.8%	85.0%	0.0%	0.0%	4.4%	89.4%	1.8%	100.0%
	Total	2.2%	21.1%	0.0%	0.0%	1.1%	22.2%	0.4%	24.9%
Chum salmon	Gear type	0.0%	6.7%	0.0%	0.0%	21.6%	6.0%	0.0%	5.4%
	Resource	0.0%	90.3%	0.0%	0.0%	9.7%	100.0%	0.0%	100.0%
	Total	0.0%	4.9%	0.0%	0.0%	0.5%	5.4%	0.0%	5.4%
Pink salmon	Gear type	0.0%	4.5%	0.0%	0.0%	12.6%	4.0%	21.6%	3.8%
	Resource	0.0%	87.1%	0.0%	0.0%	8.1%	95.2%	4.8%	100.0%
	Total	0.0%	3.3%	0.0%	0.0%	0.3%	3.6%	0.2%	3.8%

Source ADF&G Division of Subsistence household surveys, 2017.

Note Only for study year 2016 did harvest estimates distinguish between set and drift gillnet use.

Table 3-52.—Estimated harvest of salmon by gear type and resource, Perryville, 2016.

Resource	Subsistence methods															
	Removed from commercial catch		Set gillnet		Drift gillnet		Seine		Other		Subsistence gear, any method		Rod and reel		Any method	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	219.2	1,082.3	2,177.3	9,892.2	0.0	0.0	488.1	2,139.7	72.6	330.8	2,738.0	12,362.7	25.6	115.5	2,982.8	13,560.5
Chinook salmon	69.7	378.9	19.9	108.3	0.0	0.0	0.0	0.0	0.0	0.0	19.9	108.3	5.7	30.9	95.3	518.1
Sockeye salmon	92.5	405.5	1,323.5	5,801.6	0.0	0.0	488.1	2,139.7	15.7	68.6	1,827.2	8,009.9	0.0	0.0	1,919.7	8,415.4
Coho salmon	56.9	297.9	547.9	2,867.1	0.0	0.0	0.0	0.0	28.5	148.9	576.3	3,016.0	11.4	59.6	644.7	3,373.5
Chum salmon	0.0	0.0	132.3	665.9	0.0	0.0	0.0	0.0	14.2	71.6	146.6	737.5	0.0	0.0	146.6	737.5
Pink salmon	0.0	0.0	153.7	449.4	0.0	0.0	0.0	0.0	14.2	41.6	167.9	491.0	8.5	25.0	176.5	516.0

Source ADF&G Division of Subsistence household surveys, 2017.

Note The harvested number of salmon is represented as individual fish harvested.

Note Only for study year 2016 did harvest estimates distinguish between set and drift gillnet use.

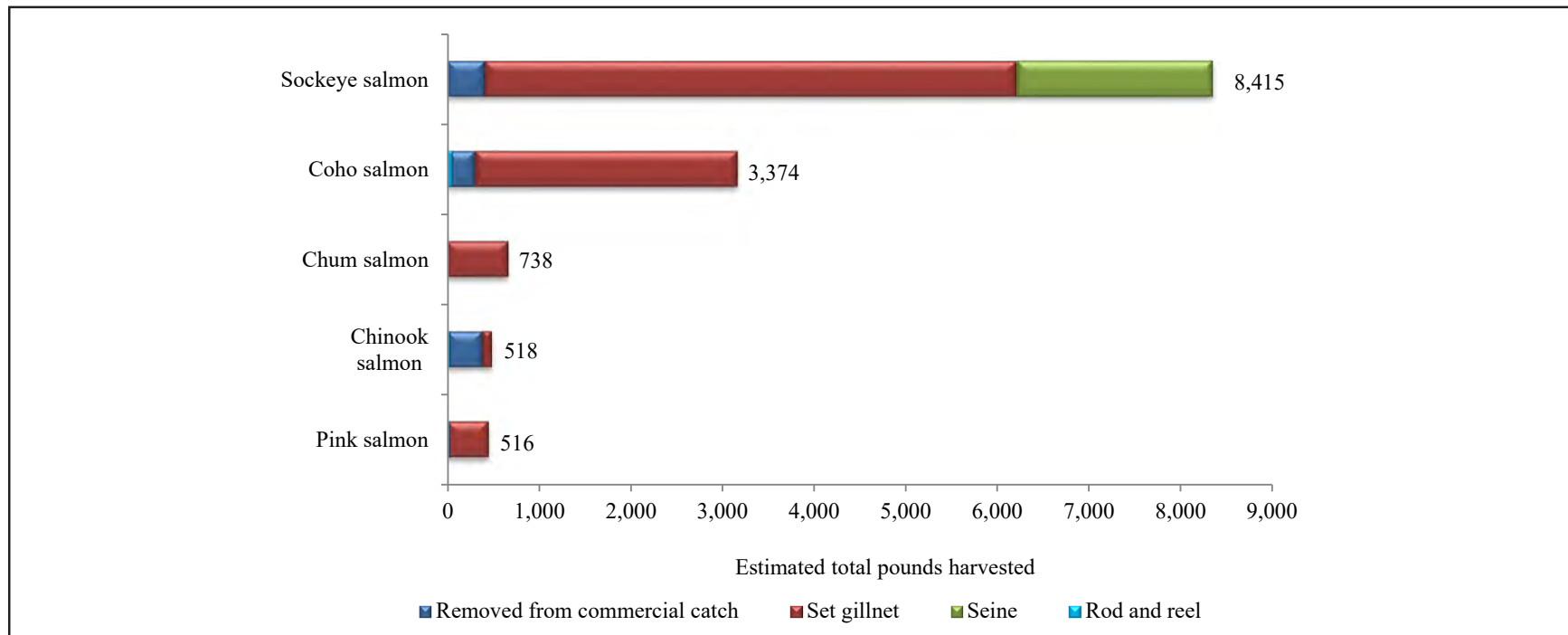


Figure 3-56.—Estimated harvest of salmon in pounds usable weight by gear type and resource, Perryville, 2016.

FISHING AND HARVEST LOCATIONS FOR SALMON: 2014–2016

In 1984 and 1985, Division of Subsistence researchers mapped community subsistence salmon fishing areas with representatives of the communities of Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville among other places in Southwest Alaska (ADF&G 1985; Fall et al. 1995; Morris 1987). The areas marked by representatives had been used regularly during the 20-year period from the mid-1960s into the 1980s. In addition, a previous Division of Subsistence study mapped locations where subsistence salmon were harvested by households in the communities of Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville interviewed in 2011 (Hutchinson-Scarborough et al. 2016). As part of this project's second study objective, and to continue building a record of salmon harvest areas to facilitate future analysis of change over time, household surveys asked respondents to document salmon harvest locations for 2014–2016. It is important to remember that respondents were asked to show household harvest locations from only a single year and resource harvest areas change or vary over time; therefore, areas not indicated as used in the study years may have been used previously.

Surveyed households that harvested salmon were asked to report harvest locations by species and gear type. Note that in every study community for every study year survey sample achievement did not reach 100% (Table 1-4). Also, some surveyed households that harvested salmon declined to respond to the portion of the survey asking for spatial harvest data. As such, maps presented in this report each depict a partial representation of a community's harvest locations for a given study year. To give some context about the partial representation, each map includes a description of the overall survey sample achievement and identifies how many harvesting households provided harvest location data that are presented on the map. Further, harvests of some species were very low, and sometimes a respondent did not provide spatial data for those harvests. This is evident when there are harvest locations provided for fewer species than were harvested by a community in that year.

Chapter 1 provides a full description of the methods used to collect and complete analysis for spatial harvest data. The Division of Subsistence used a new, electronic method of collecting spatial data during this project. Respondents could indicate a fishing or harvest location at a specific point or generalized area using a polygon or line drawn on a U.S. Geological Survey topographic relief map downloaded on an iPad. The iPad allowed the respondent to zoom in and out to the appropriate scale, and the ability to document harvesting activities wherever they occurred in the state of Alaska. The data were then uploaded using WiFi through ArcGIS Online to the ESRI (Environmental Systems Research Institute) cloud server for storage. However, the research team experienced problems with uploading data, particularly if a WiFi connection was unstable, and concluded that some collected data were lost. The communities and years where this occurred include: Chignik Bay (2016), Chignik Lagoon (2014 and 2016), Chignik Lake (2014 and 2016), and Perryville (2015). Further, there is one other facet of the new method for collecting fishing and harvest location information that researchers noted during survey administration. Since respondents were new to this data collection experience, many of the areas depicted on the map represent general locations of harvest and not the entire area where a household fished; this is especially the case when households noted fishing with purse seine gear. For example, a person might have made several sets of a net in the northeastern portion of Chignik Lagoon, but the harvest area was only noted using a point, not a polygon. Based on experience conducting postseason salmon surveys in these communities, ADF&G researcher Hutchinson-Scarborough has assessed that mapping results for this project show a significantly small proportion of actual salmon fishing and harvest locations used by residents who harvested salmon in the study communities. In addition to the sampling-related reasons previously described, the lost data and user experience contribute to these maps being a partial representation of search and harvest locations for each community in the years 2014–2016.

As mentioned previously, respondents were asked to indicate the gear type used at each harvest location, except respondents who retained salmon from commercial catches for home use were not asked to identify the location of the commercial harvest that provided home pack. Following is a brief summary of gear type use patterns that pulls from previously published information in Hutchinson-Scarborough et al. (2016) to help give context to the mapped results that are presented for each community and study year.

Gillnets are primarily used on the beach of the ocean or shore of rivers or lakes anywhere that salmon can be harvested by tying one end to land and bringing the other end out into the water with a skiff. Individuals from the bay and lagoon tend to use areas located both at the mouth of the Chignik River and upriver of the weir because it involves traveling the shortest distance. At the mouth of the river subsistence fishers sometimes will drift their gillnets because the water moves fast as it enters the mouth. Gillnets are set on beaches by Perryville residents at the mouths of spawning streams along the coastline bordering the community of Perryville and at Anchor, Ivan, Humpback, and Ivanof bays. Purse seine gear is most commonly used by residents in Chignik Bay or Chignik Lagoon who also commercial fish to harvest salmon for subsistence prior to the first commercial salmon opening. Beach seines are primarily used in Chignik Lake, and at the mouth of tributaries of Chignik Lake (particularly Clark River) to harvest “red fish” (sockeye salmon changing color to red after beginning spawning) at the end of the commercial fishing season during the late run. Beach seine is an effective gear type for gathering many fish and is preferred by many compared to using gillnets since gillnets can mangle the flesh of the soft spawning salmon. Rod and reel use is not authorized for subsistence fishing in the CMA by state regulations. However, rod and reel may be used in all fresh waters and salt waters of the CMA under state sport fishing regulations that also include season, size, possession, and annual harvest limits, which are published in a regulations summary posted on the ADF&G website¹⁷ annually, and this gear type is authorized for the Chignik Area for qualified local residents under federal subsistence regulations (36 CFR 242.27(e)(8)(vi)). Rod and reel is a useful gear type for targeting harvests based on species or number of fish desired. Federal subsistence regulations authorize residents of the communities to harvest salmon using a variety of methods, including: rod and reel, as mentioned above, handline or jig, spear, and by hand. The most common other gear used is a handline or jig. Jigging is done with the intent of harvesting spawned-out sockeye salmon, which is generally done upriver of the community of Chignik Lake in shallow water tributaries, particularly in Clark River, with a handmade jig that consists of a long nylon line with a treble hook attached. Many local fishers prefer this method because it is a selective fishing method, and it will not snag like a net would in the shallow water. Sockeye salmon are harvested for subsistence as early as late April in Chignik Lagoon and Chignik River, and as late as February in Clark River, a tributary of Chignik Lake.

The communities of Chignik Bay, Chignik Lagoon, and Chignik Lake are all situated within the Chignik River watershed and have access to two genetically distinct sockeye salmon runs, which is the primary targeted species obtained for subsistence as well as for commercial harvests. Sockeye and Chinook salmon do not spawn in any streams easily accessible to Perryville residents; however, on occasion these species will be caught using a net off of the beach by their community or by use of rod and reel, a legal gear authorized under federal subsistence regulations. Some families of commercial fishers will stay at summer homes or fish camps located on northwest shore of Chignik Lagoon and set a gillnet to acquire subsistence sockeye salmon while their other family members commercial fish, or during commercial fishing closures.

17. Alaska Department of Fish and Game. n.d. “Sport Fishing Regulations: Southwest Alaska.” http://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.sw_sportfish (accessed June 2020).

Chignik Bay

2014

Figure 3-57 depicts reported harvest locations of all five salmon species in 2014 by eight responding Chignik Bay households that harvested salmon, which is a partial representation of locations where salmon were harvested. Sockeye salmon were harvested primarily in Chignik Bay and Lagoon by the spit and in Chignik Lake in two dominant shoreline locations: at Hatchery Beach and the northernmost point of the lake. Chinook and coho salmon were harvested near the Chignik Lagoon spit and chum and pink salmon were taken in the local creek nearby Chignik Bay Village. Seine and gillnet were the gear used in 2014 to harvest salmon in Chignik Lagoon and Chignik Lake, and rod and reel was used in the local creek at Chignik Bay Village (Figure 3-58).

2015

In 2015, eight Chignik Bay households surveyed that harvested salmon gave information for the partial community representation of salmon harvest locations depicted in Figure 3-59 for all five salmon species. Sockeye salmon were taken primarily in Chignik Bay and Chignik Lagoon on either side of the spit, and in Chignik Lake at Clark River and Hatchery Beach. Chinook salmon were harvested in Anchorage Bay, at the spit in Chignik Lagoon, and in upper Chignik Lagoon by Chignik Island. All other salmon were taken either in Anchorage Bay or at the Chignik Lagoon spit. Seine and gillnet were the primary gear used in 2015 to harvest salmon in Chignik Lagoon, Bay, and Lake, and rod and reel and other gear (handline) were used on beaches and creeks close to Chignik Bay Village, and in Chignik Lagoon by Chignik Island for harvesting Chinook salmon (Figure 3-60).

2016

Figure 3-61 shows the salmon harvest locations in 2016 by six responding Chignik Bay households, which is a partial representation of locations where salmon were harvested by community households that year. Sockeye salmon were harvested in Chignik Lagoon at the spit and in Chignik Lake by Clark River, and Chinook salmon were taken off the beach by Chignik Bay Village. Salmon were harvested primarily using seine but also gillnet by the Chignik Lagoon spit, and by seine in Chignik Lake by Clark River (Figure 3-62). Rod and reel was used in Anchorage Bay by the Chignik Bay Village. Also, a respondent harvested coho salmon using rod and reel at the mouth of Reindeer Creek located near the community of Port Heiden, and no harvest locations were collected for pink salmon.



Figure 3-57.—Fishing and harvest locations of Chinook, coho, pink, sockeye, and chum salmon, Chignik Bay, 2014.



Figure 3-58.—Fishing and harvest locations of all salmon species, by gear type, Chignik Bay, 2014.



Figure 3-59.—Fishing and harvest locations of Chinook, coho, pink, sockeye, and chum salmon, Chignik Bay, 2015.



Figure 3-60.—Fishing and harvest locations of all salmon species, by gear type, Chignik Bay, 2015.



Figure 3-61.—Fishing and harvest locations of Chinook, coho, and sockeye salmon, Chignik Bay, 2016.



Figure 3-62.—Fishing and harvest locations of Chinook, coho, and sockeye salmon, by gear type, Chignik Bay, 2016.

Chignik Lagoon

2014

Although household survey estimates indicate all five species of salmon were harvested by Chignik Lagoon households in 2014, based on responses from five harvesting households, Figure 3-63 depicts harvest locations for only three species. Salmon harvests occurred mostly in upper Chignik Lagoon near Chignik Island and the Columbia Ward Fisheries Facility; most of these sites were for harvests of sockeye salmon. There were also sockeye salmon harvests in Chignik Lagoon and Chignik Bay along the spit. Chinook salmon were caught by Chignik Island in Chignik Lagoon and upper Chignik River. Sockeye and chum salmon were harvested at the mouth of Chignik River, too. Salmon was mostly harvested using seine, but gillnet and rod and reel were used in the Chignik River (Figure 3-64). Although researchers did not ask respondents to provide information about where commercial fishing occurred that provided home pack, a respondent volunteered that sockeye salmon were commercially harvested near Castle Bay and kept for home use.

2015

Harvest areas for four of the five harvested salmon species were identified by 19 responding households, which depict a partial representation of 2015 harvest locations for the community overall (Figure 3-65). Sockeye salmon were pursued in the most widespread area: in Chignik Bay and Chignik Lagoon by the spit, upper Chignik Lagoon on the north side of Chignik Island, upper Chignik River, and in Chignik Lake as far north as Hatchery Beach and by Clark River and Home Creek. Chinook salmon were harvested in Chignik River upriver from the weir, and coho salmon harvests were clustered around the mouth of Chignik River on the north bank. In the area around the spit and in Chignik Lake seine was nearly exclusively used (Figure 3-66). Gillnet and seine were both used in Chignik Lagoon and River, but rod and reel was used only in upper Chignik River.

2016

There were 11 harvesting households that provided responses to the request for spatial data that provide the partial community representation of 2016 salmon harvest locations depicted in Figure 3-67. Sockeye salmon were taken throughout Chignik Lagoon, in Clark River, at Castle Cape, and at Cape Ikti located by Kuiukta Bay. Also, sockeye salmon were harvested from along the spit between Chignik Bay and Lagoon. Chinook salmon were taken in the upper Chignik Lagoon, Mensis Point, the Chignik River, and mouth of Chignik Lake. Coho salmon were harvested at Chignik Bay along the spit, Chignik Lagoon near a river mouth, and in Chignik Lake. Pink salmon were taken in Chignik Lagoon, and pink and chum salmon were both harvested in Castle Bay. Salmon were harvested primarily with seine or gillnet, but rod and reel was used in the Chignik River (Figure 3-68).



Figure 3-63.—Fishing and harvest locations of Chinook, sockeye, and chum salmon, Chignik Lagoon, 2014.



Figure 3-64.—Fishing and harvest locations of Chinook, sockeye, and chum salmon, by gear type, Chignik Lagoon, 2014.

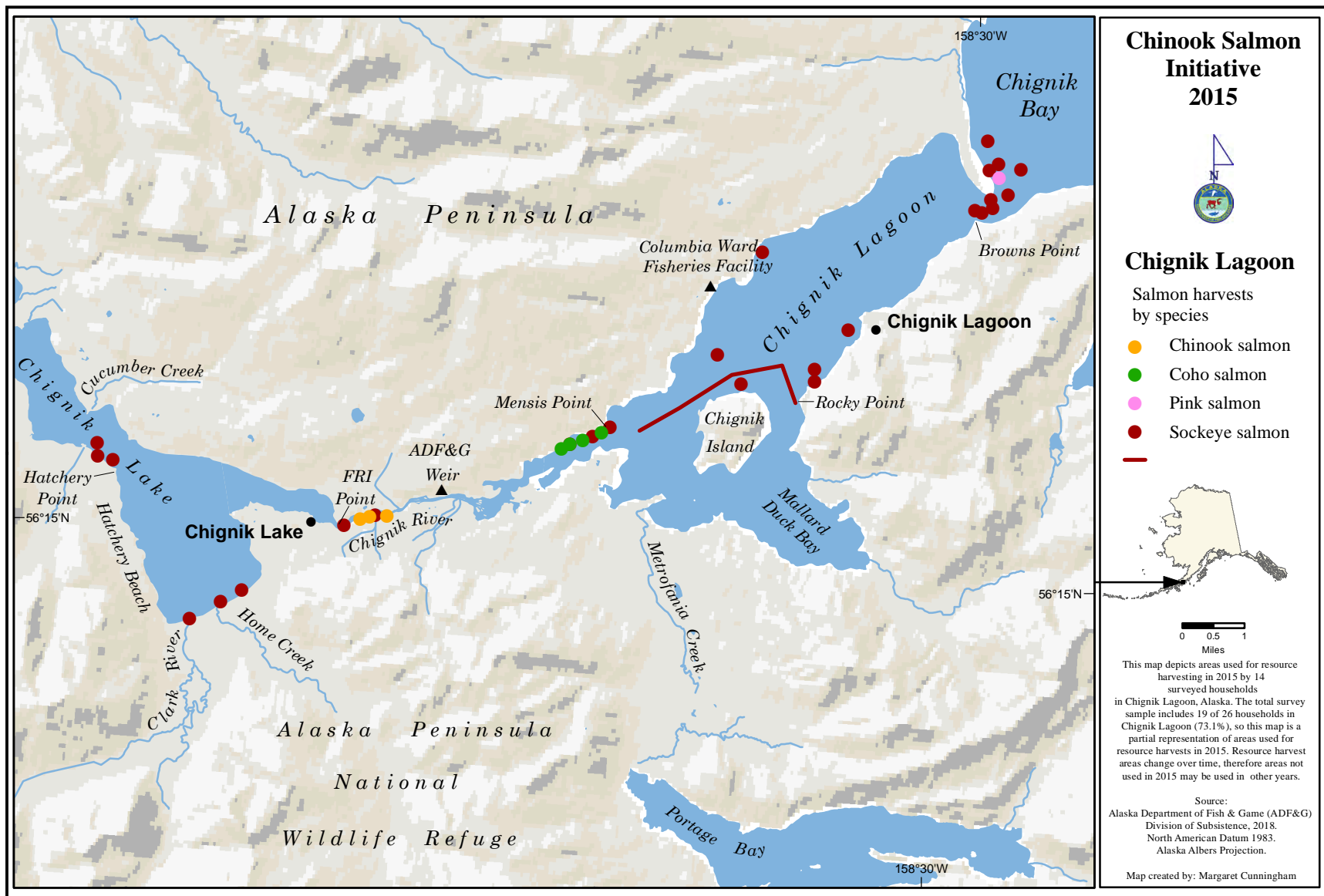


Figure 3-65.—Fishing and harvest locations of Chinook, coho, pink, and sockeye salmon, Chignik Lagoon, 2015.

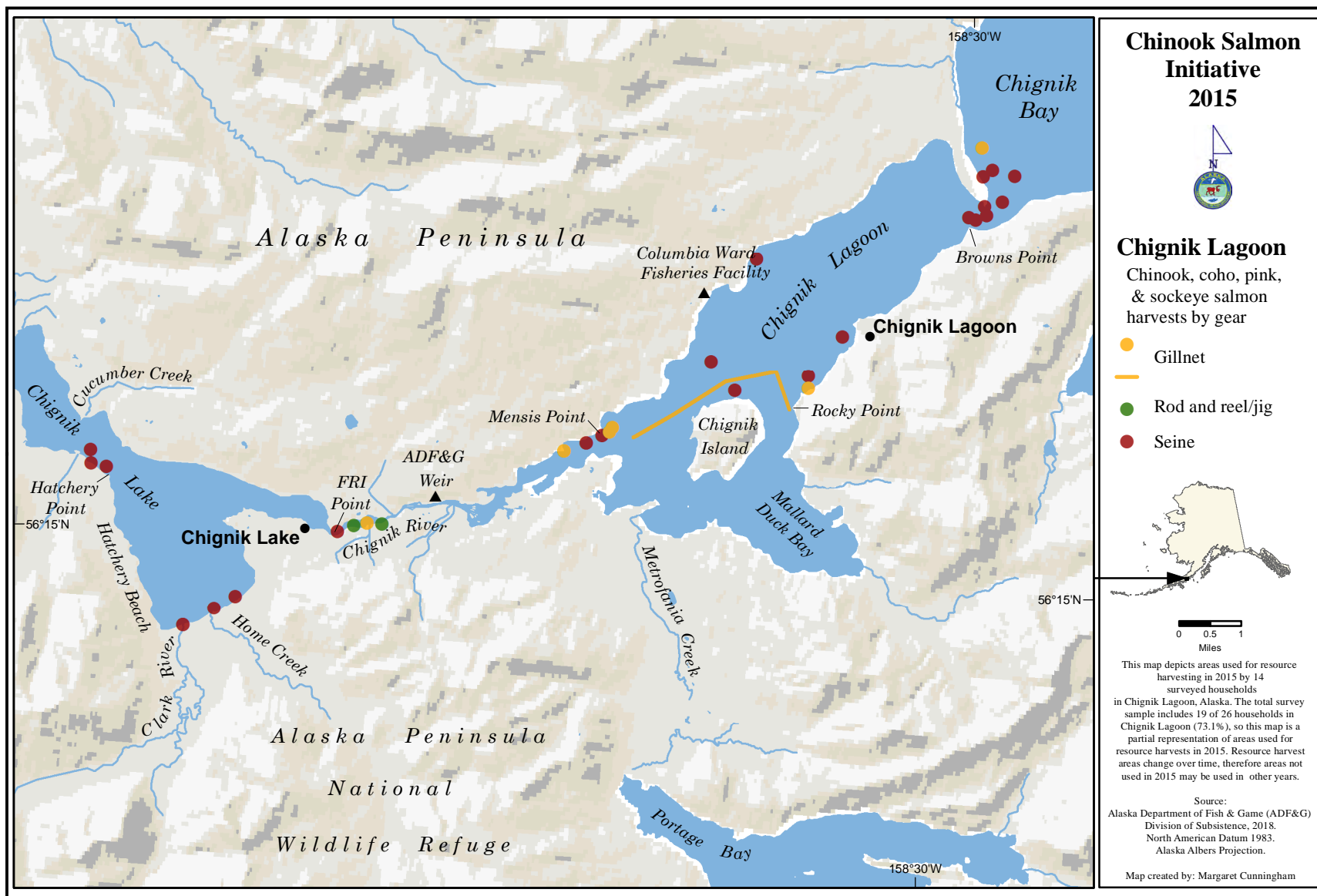


Figure 3-66.—Fishing and harvest locations of Chinook, coho, pink, and sockeye salmon, by gear type, Chignik Lagoon, 2015.



Figure 3-67.—Fishing and harvest locations of Chinook, coho, pink, sockeye, and chum salmon, Chignik Lagoon, 2016.

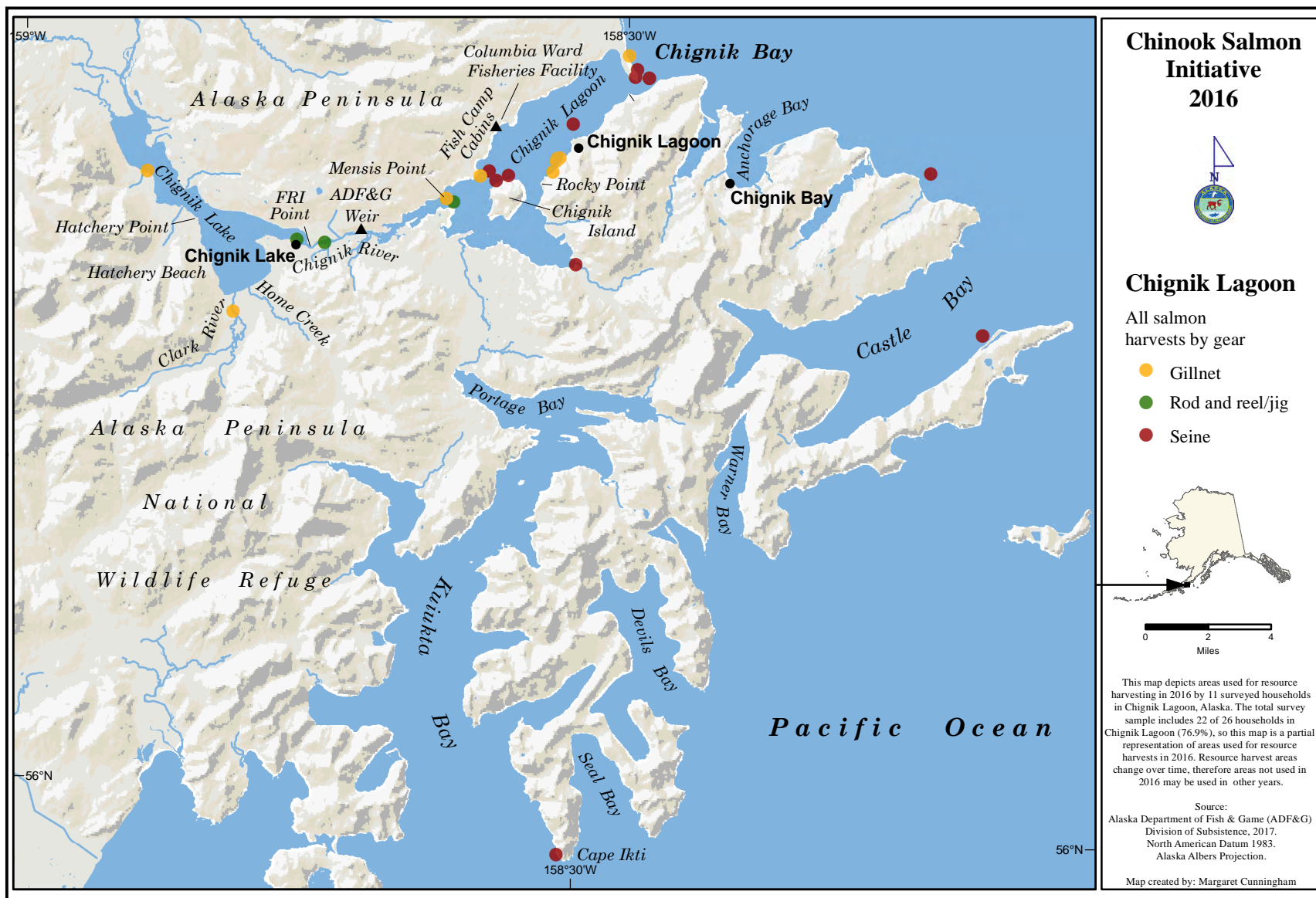


Figure 3-68.—Fishing and harvest locations of all salmon species, by gear type, Chignik Lagoon, 2016.

Chignik Lake

2014

Four surveyed households provided spatial data for harvest locations for only sockeye salmon despite the household survey estimates indicating all five salmon species were harvested in 2014. Figures 3-69 and 3-70 depict a partial representation of harvest areas for Chignik Lake residents with sockeye salmon being caught at the inlet and outlet of Chignik River using gillnet, and in Chignik Lake using primarily beach seine but also rod and reel at a location near Cucumber Creek.

2015

There were 20 households that provided harvest location information for four of the five species harvested in 2015. Although Figure 3-71 still depicts a partial representation of harvest areas for Chignik Lake households, in comparison to the previous study year these data likely more closely reflect the full range of harvest areas since so many more households provided spatial data for 2015 than 2014. Sockeye salmon were taken throughout the Chignik River drainage from upper Chignik Lagoon all the way past Black Lake in Alec River. The few coho and pink salmon harvested were taken in the Chignik River and Chignik Lake, and Chinook salmon were taken only in the upper Chignik River by the Chignik Lake community. Salmon were taken mostly by gillnet, but in addition to gillnet, beach seine and rod and reel jig gear were also used in Chignik Lake predominantly at the mouth of Clark River and along Hatchery Beach (Figure 3-72). Also, seine was used at the mouth of Chignik River.

2016

Harvest areas for only two species were identified by 14 households to provide a partial representation of the overall Chignik Lake community's harvest locations in 2016 (Figure 3-73). Salmon harvested by responding interviewed households were mostly sockeye salmon, and the few harvested Chinook salmon were taken only in the upper Chignik River and by gillnet (Figure 3-73; Figure 3-74). Salmon were harvested using seines and gillnets in upper Chignik Lagoon and the mouth of Chignik River, and in Clark River. At the head of Chignik River only gillnet use occurred, and only beach seines were used in Chignik Lake. Rod and reel/jig was used in Clark River and up a creek with an outlet located by Hatchery Point.



Figure 3-69.—Fishing and harvest locations of sockeye salmon, Chignik Lake, 2014.



Figure 3-70.—Fishing and harvest locations of sockeye salmon, by gear type, Chignik Lake, 2014.



Figure 3-71.—Fishing and harvest locations of Chinook, coho, pink, and sockeye salmon, Chignik Lake, 2015.



Figure 3-72.—Fishing and harvest locations of Chinook, coho, pink, and sockeye salmon, by gear type, Chignik Lake, 2015.



Figure 3-73.—Fishing and harvest locations of Chinook and sockeye salmon, Chignik Lake, 2016.

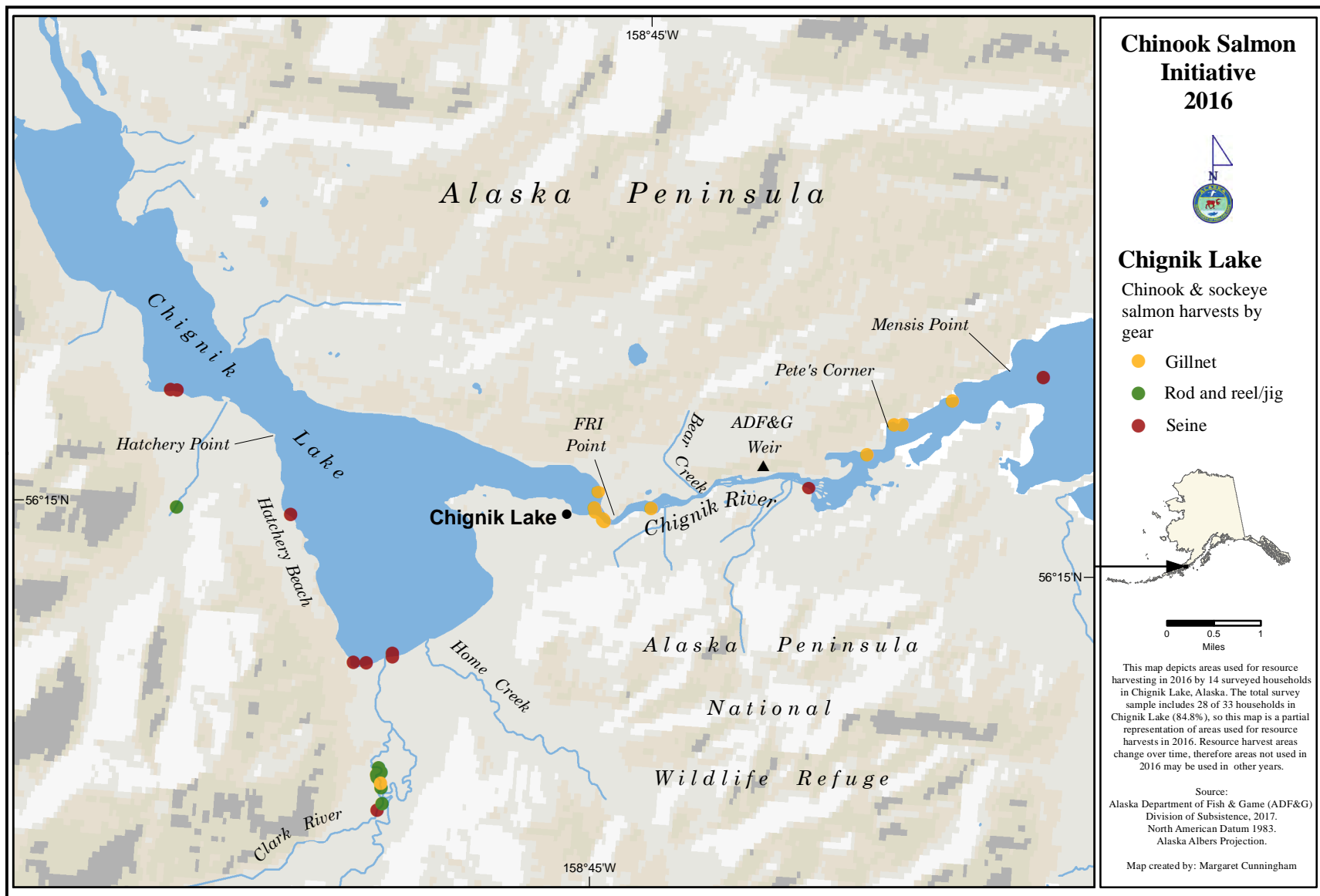


Figure 3-74.—Fishing and harvest locations of Chinook and sockeye salmon, by gear type, Chignik Lake, 2016.

Perryville

2014

Figure 3-75 depicts reported harvest locations of all five salmon species in 2014 by 23 responding Perryville households that harvested salmon, which is a partial representation of locations where salmon were harvested by community households. Perryville residents in 2014 harvested salmon in the Chignik River drainage in Chignik Bay by the spit, in Chignik Lagoon between the spit and Chignik Island, and Chignik Lake at Hatchery Beach. Also, harvests occurred along the Pacific Ocean from the head of Ivanof Bay to the beach bordering Perryville, as well as along Kametolook River. Sockeye salmon were harvested throughout the Chignik River drainage, in Humpback Bay, along the beach by Perryville, and at the headwaters of Kametolook River. Chinook salmon were taken by the Chignik Lagoon spit and off the beach by Perryville. Chum and pink salmon were also taken off the beach by Perryville, and chum salmon were also harvested at the mouth of Ivanof River. Coho salmon were harvested in the most diverse array of locations off the Pacific Coast including at Ivanof Bay, Humpback Bay, Longbeach River (known locally as Artemies Creek), and Kametolook River. All salmon harvested from the Chignik River drainage were taken using seine gear and along the Pacific Coast primarily by gillnet, but also rod and reel was used at Three Star Point near Perryville (Figure 3-76).

2015

Harvest areas for all five harvested salmon species were identified by 15 responding households, which depict a partial representation of 2015 harvest locations for the community overall (Figure 3-77). Perryville residents in 2015 harvested sockeye salmon in the Chignik River drainage in Chignik Bay by the spit, in Chignik Lagoon near the Columbia Ward Fisheries Facility, in upper Chignik River, and from Chignik Lake at the mouth of Clark River. Also, sockeye salmon were harvested in Longbeach River and along the beach adjacent to Perryville. The beach area from Perryville to Three Star Point was a concentrated harvest area for all five species, and Chinook salmon were harvested only in that area. Pink and chum salmon were also harvested at Kametolook River, and additional coho salmon harvest locations were spread out: Ivanof River, Humpback Bay, Longbeach River, and Kametolook River. In the Chignik River drainage, seine was used at each location except in the Chignik River, where gillnet was used (Figure 3-78). For the harvest areas spreading from Ivanof River to the beach area at Perryville, gillnet was used predominantly with rod and reel used in Longbeach River, at the Perryville beach area, and in Kametolook River.

2016

All five species of salmon were harvested by Perryville households in 2016 and a partial representation of harvest locations that year was provided by 18 responding households (Figure 3-79). Sockeye salmon were harvested throughout the Chignik River drainage: Anchorage Bay, Chignik Bay, Chignik Lagoon, Chignik River, Chignik Lake, and Clark River. Sockeye salmon were also taken off the beach by Perryville and in Kametolook River. Chinook salmon were harvested solely at the beach near Perryville. Coho salmon were taken along the Pacific Coast in Ivanof Bay, Humpback Bay, along the full length of Longbeach River, from Three Star River, off the beach by Perryville, and in Kametolook River. Pink and chum salmon were also harvested at Ivanof Bay, near the village of Perryville, and in the Kametolook River. Most salmon were harvested using gillnet, and seine gear was used in Chignik Lake, Clark River, and in Chignik Bay and Anchorage Bay (Figure 3-80). Rod and reel was used in Ivanof Bay, off the beach by Perryville, and in the Kametolook River.

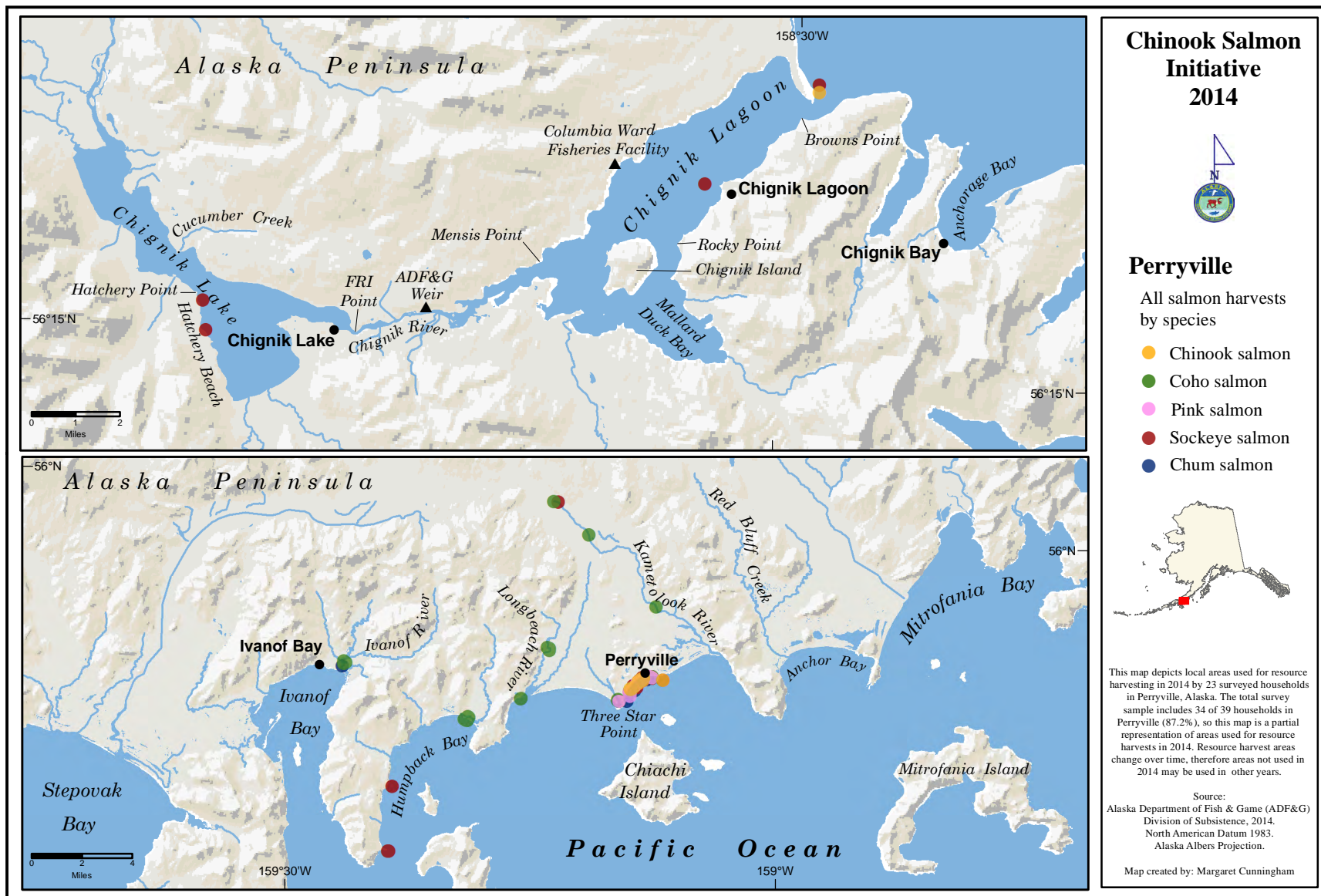


Figure 3-75.—Fishing and harvest locations of Chinook, coho, pink, sockeye, and chum salmon, Perryville, 2014.



Figure 3-76.—Fishing and harvest locations of all salmon species by gear type Perryville, 2014.

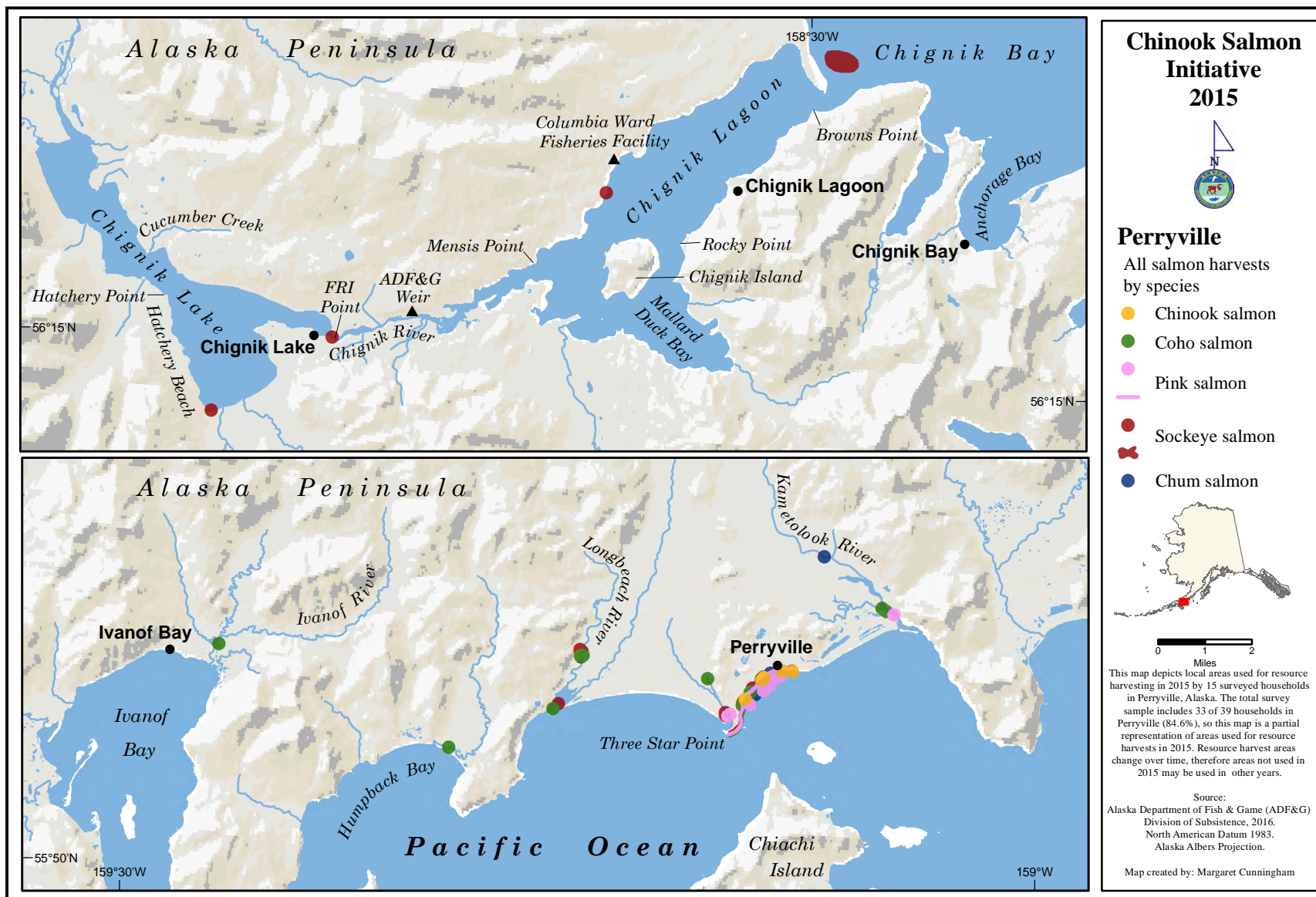


Figure 3-77.—Fishing and harvest locations of Chinook, coho, pink, sockeye, and chum salmon, Perryville, 2015.

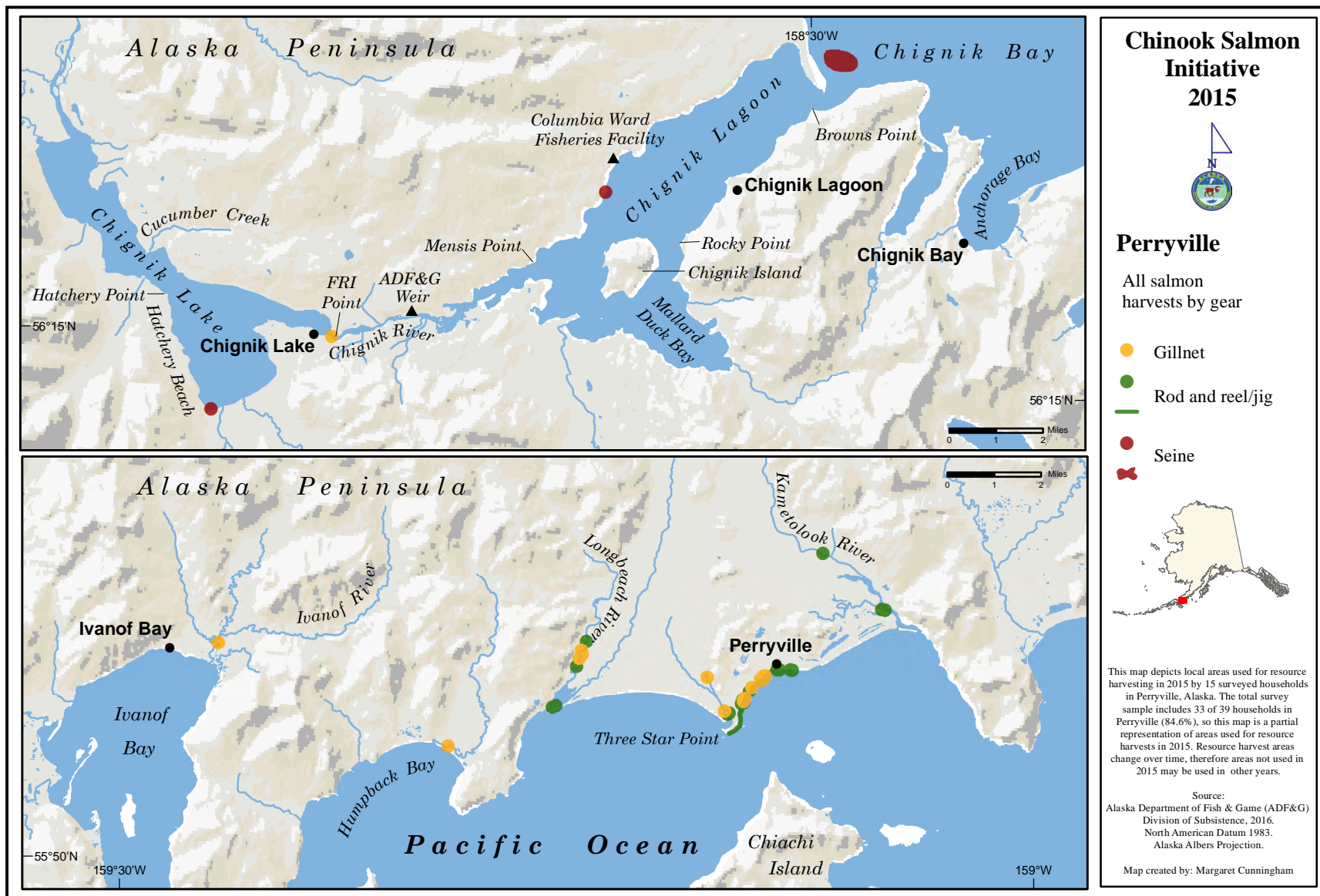


Figure 3-78.—Fishing and harvest locations of all salmon species, by gear type, Perryville, 2015.

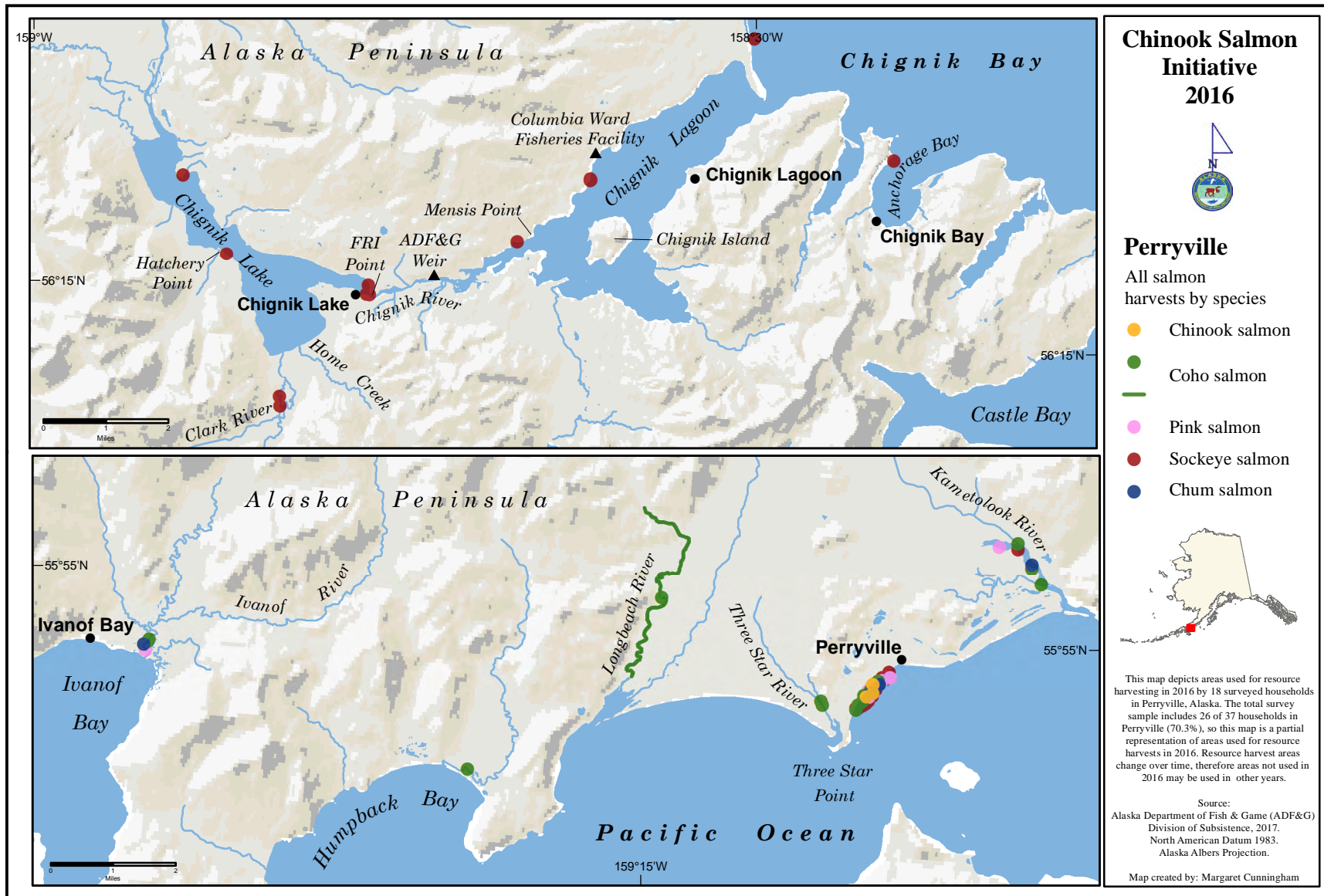


Figure 3-79.—Fishing and harvest locations of Chinook, coho, pink, sockeye, and chum salmon, Perryville, 2016.

Figure 3-80.—Fishing and harvest locations of all salmon species, by gear type, Perryville, 2016.

SUMMARY OF CHINOOK SALMON USE AND HARVEST CHARACTERISTICS FOR STUDY COMMUNITIES COMBINED: 2014–2016

Based on household survey results combined for all four communities of Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville, the harvest and use patterns of Chinook salmon steadily declined from 2014 to 2016. In 2014, one-half (50%) of households used Chinook salmon, which decreased to 46% in 2015 and 39% in 2016 (Figure 3-81). The percentage of households that harvested Chinook salmon declined over time as well. In 2014, 37% of households attempted to harvest, and 30% harvested, Chinook salmon; in 2015, 30% fished for, and 28% harvested this species; and in 2016, 28% of households fished for Chinook salmon and 26% harvested. Sharing of Chinook salmon also declined. In 2014, 29% of households equally received and gave away Chinook salmon. In both 2015 and 2016, a larger proportion of households received Chinook salmon than gave away this resource, but the proportion declined year-to-year for both sharing characteristics.

Household survey results combined for all four study communities found that, in 2014, most Chinook salmon obtained for home use were harvested by gillnet (42%) and commercial removal (37%) (Figure 3-82). The remainder of the Chinook salmon harvest was obtained by rod and reel (11%) or seine (10%). The combined community harvest patterns in 2015 and 2016 were more similar to each other in that most of the Chinook salmon harvest was retained from households' commercial harvests: 67% in 2015 and 79% in 2016. The remainder of the Chinook salmon harvest for each year came from rod and reel (19% in 2015 and 12% in 2016), gillnet (10% in 2015 and 6% in 2016), and seine (4% and 3%, respectively). Over the three-year period, about 65% of Chinook salmon harvested for home use in the four study communities were retained from households' commercial harvests, about 21% were harvested with subsistence nets or seines, and about 14% were taken with rod and reel (Figure 3-83).

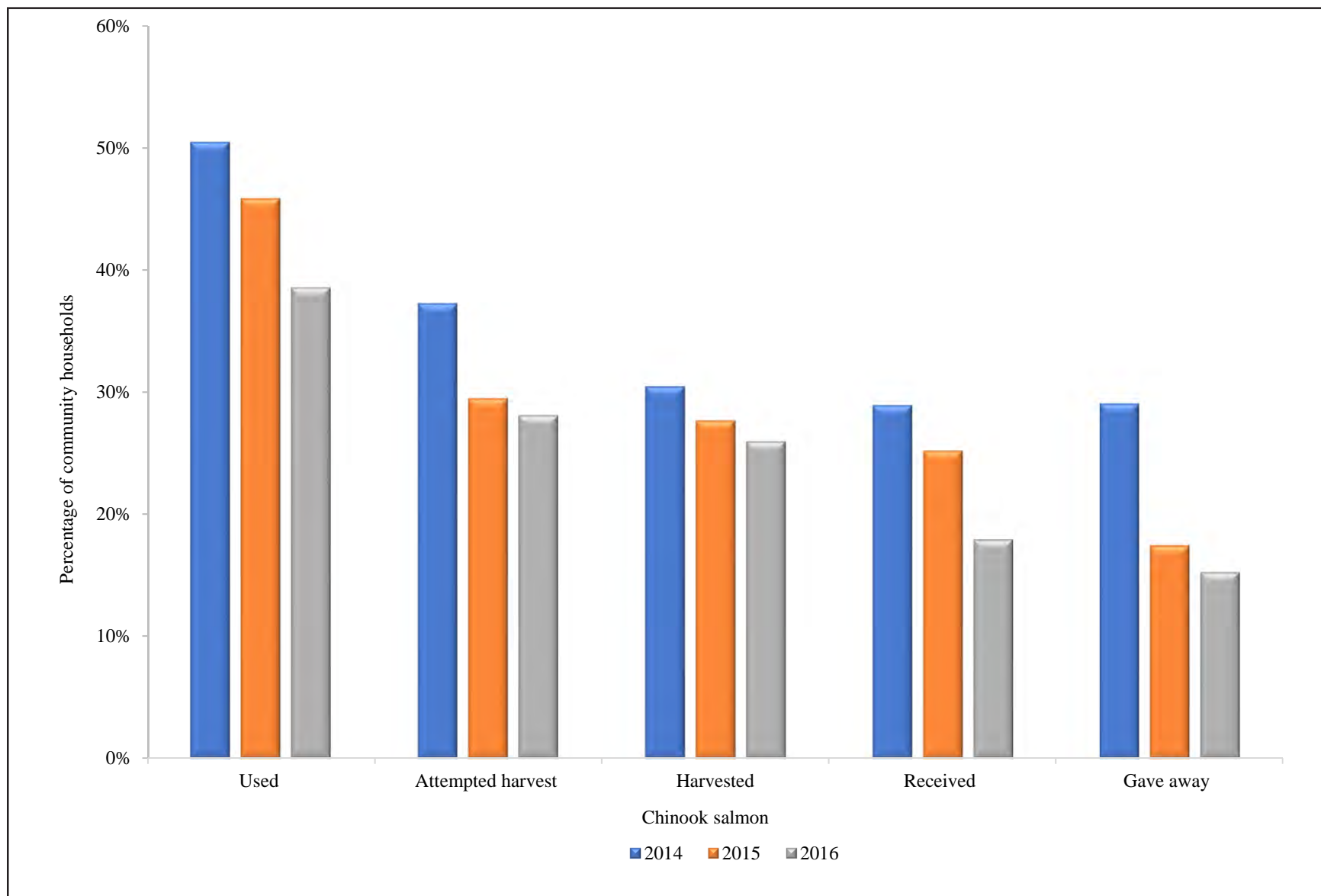


Figure 3-81.—Percentages of households that used, attempted to harvest, harvested, and shared Chinook salmon, study communities combined, 2014–2016.

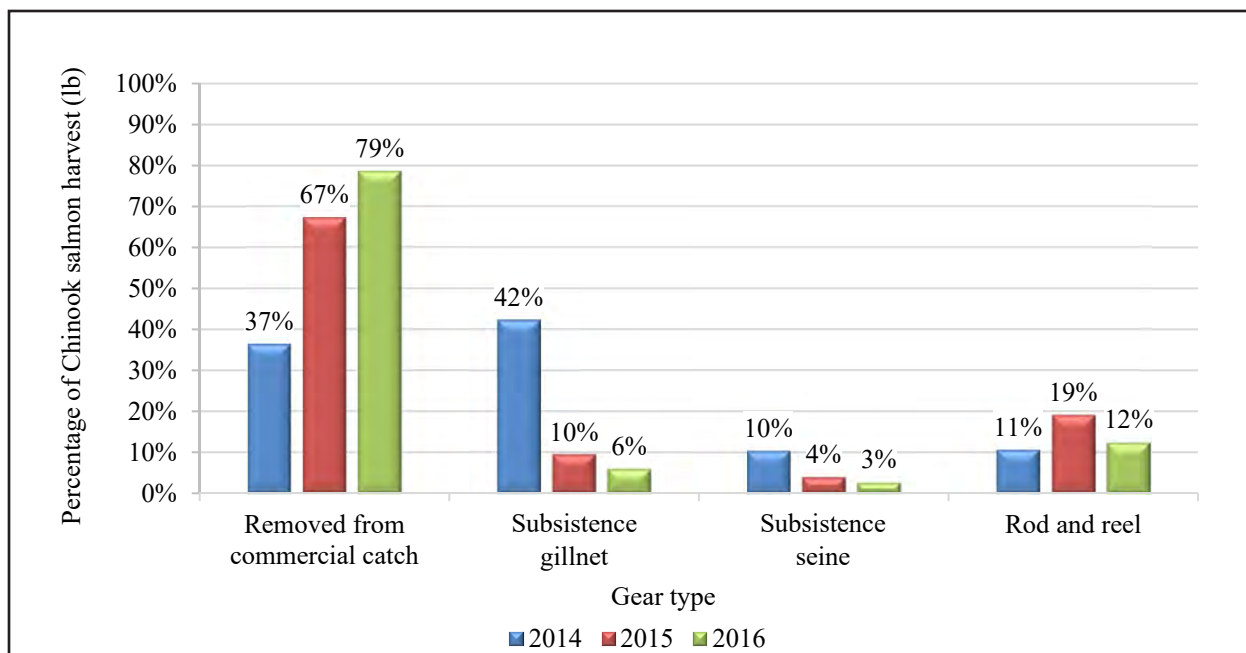


Figure 3-82.—Percentage of Chinook salmon harvest, in pounds usable weight, caught by gear type, study communities combined, 2014–2016.

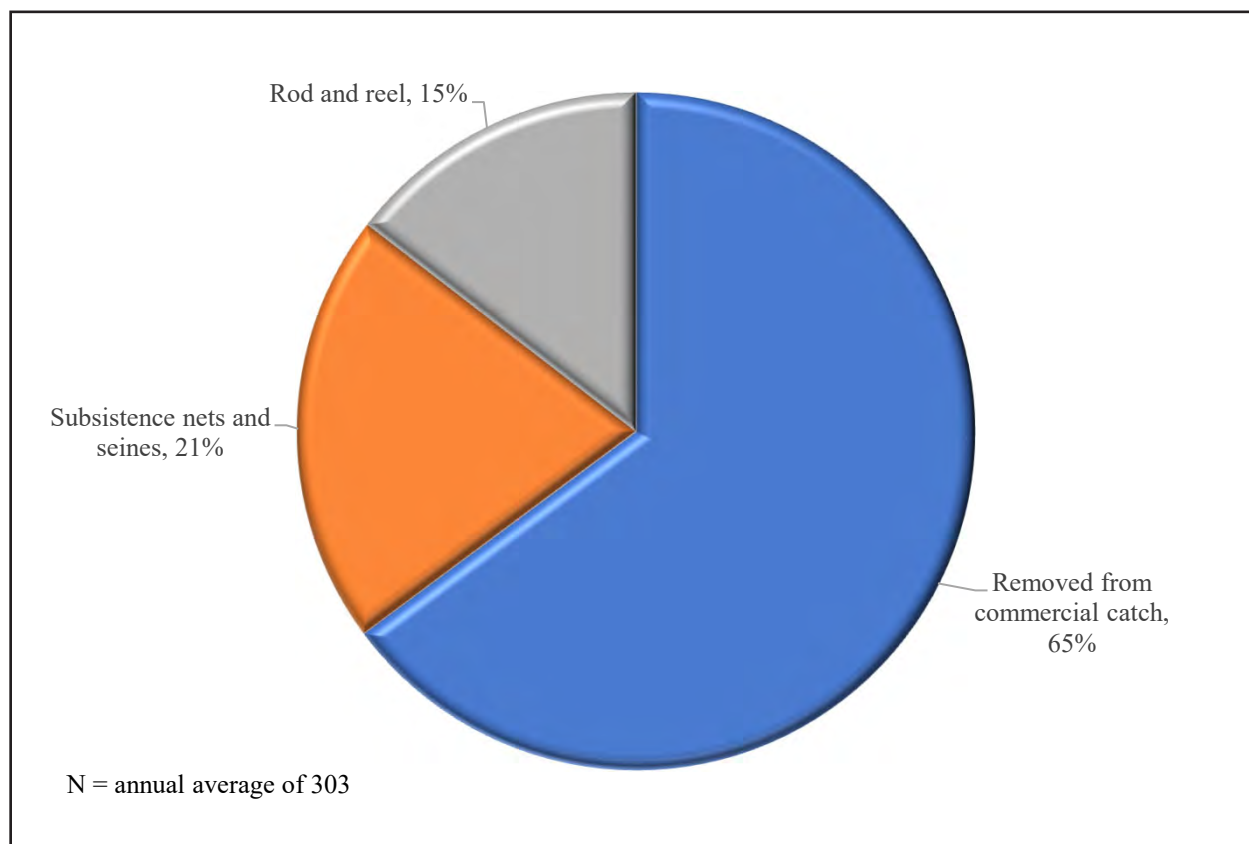


Figure 3-83.—Percentage of Chinook salmon harvests for home use by gear type, study communities combined, annual average, 2014–2016.

USE ASSESSMENTS

Researchers asked respondents to assess their own harvests in two ways: whether they used more, less, or about the same amount of salmon as in the past five years, and whether they got “enough” salmon. Households also were asked to provide reasons¹⁸ if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough. They were further asked whether they did anything differently (such as supplement with store-bought food or switch to a different subsistence resource) because they did not get enough.¹⁹ Households were asked to make these assessments for Chinook salmon, sockeye salmon, and all other salmon combined (chum, coho, and pink salmon) in 2014; however, in 2015 and 2016, assessments were asked for Chinook salmon, early-run sockeye salmon (or “bright” sockeye salmon), late-run sockeye salmon (or “red fish” or spawning sockeye salmon), and all other salmon combined (chum, coho, and pink salmon). Additionally, for study years 2015 and 2016, survey respondents who did not get enough of a salmon resource were asked to identify how many of that salmon species does the household need annually.

For those instances in which respondents were asked to assess the use of sockeye salmon separated by early-run (or first run) and late-run (or second run) sockeye salmon resources, it was not always possible to know what run a fish was harvested from; however, local subsistence users often can distinguish the difference based on the appearance of the fish, condition of the fish, and the timing and location of when and where fish were harvested. For example, bright, silver sockeye salmon caught in late May to early June are from the early run; sockeye salmon turning bright red, which are referred to by residents as “red fish,” that are harvested in Chignik Lake and Clark River in the fall are from the second run. Not all residents knew what run their fish came from, especially if they received fish from another harvester, so researchers asked respondents to make their best assessment during survey administration to assign either of those characterizations to the sockeye salmon that were used in 2015 and 2016.

This section discusses responses to this entire series of questions. Note that because not every household uses all salmon resources, some households did not respond to the assessment questions. Additionally, some households that do typically use a salmon resource simply did not answer questions.

Chignik Bay

2014

Sockeye Salmon

Of 25 sampled households in Chignik Bay in 2014, 96%, or 24 households, used sockeye salmon, of which 52%, or 13 households, said they used fewer fish; 36%, or nine households, said they used the same amount; and 8%, or two households, said they used more sockeye salmon in 2014 compared to the previous five or so years (Table 3-53 Figure 3-84). Households that used less responded with the following general reasons: fewer fish were shared with their households (seven responses), resources were less available (six responses), tried to harvest but unsuccessful (two responses), too busy/working (one response), and needed less (one response) (Table 3-54). Only two households reported using more sockeye salmon and the reason they both gave for increased use was that they received more in 2014 than in previous years (Table 3-55). Compared to the other salmon resources, in 2014 many more sampled households in Chignik Bay had enough sockeye salmon (Figure 3-85). In Chignik Bay, only four responding households (17%) said they did not get enough sockeye salmon to meet their needs in 2014; further, only two of those households said the impact was major while one household said the impact was not noticeable and the other did not provide a response (Table 3-56). The four households that said they did not get enough sockeye salmon to meet their needs were asked what their household did differently as a result of not getting enough sockeye salmon,

18. Note that households could cite more than one reason for less or more use of salmon resources.

19. Note that households could provide more than one description of what was done differently in a study year as a result of not having enough salmon resources.

and all four responded that they used more commercial foods to make up for the lack of sockeye salmon harvested or received in 2014 (Table 3-57). Additionally, one household indicated making do without having enough of that salmon resource.

Chinook Salmon

Out of 25 sampled households, 15 (60%) used Chinook salmon and 10 (40%) said they used fewer fish, four (16%) said they used the same amount, and one (4%) used more compared to recent previous years (Table 3-53; Figure 3-84). Of those households that decreased use, reasons provided for why were as follows: Chinook salmon were less available (five responses), less sharing/did not receive as much (five responses), tried harvesting but unsuccessful (two responses), regulations (one response), and working/no time to harvest (one response) (Table 3-54). The one household that used more Chinook salmon indicated this was due to more harvest success (Table 3-55). Chinook salmon is the salmon resource for which the fewest sampled households indicated there was enough in 2014 (Figure 3-85). There were three out of 15 responding households that did not get enough Chinook salmon and two of those households said that the impact of not getting enough was minor, and the other household said it was unnoticeable (Table 3-56). None of these households explained whether they did anything differently as a result of not getting enough Chinook salmon (Table 3-57).

Other Salmon

Out of 25 sampled households, 56% (14 households) used other salmon; four (16%) decreased use; nine (36%) used the same amount, and one (4%) used more of the other salmon species in general compared to the previous five years (Table 3-53; Figure 3-84). The reasons provided by four households explaining less use of other salmon were that the household received less (three responses) and unsuccessful harvest efforts (two responses) (Table 3-54). The one household that used more other salmon species attributed this to receiving more salmon (Table 3-55). Although many sampled households did not use the other salmon species, the majority (52%) that did had enough (Figure 3-85). Only one household said it did not get enough other salmon in 2014 to meet household needs, but the impact to the household was not noticeable, and the household made do without (Table 3-56; Table 3-57).

Table 3-53.—Changes in household uses of salmon compared to recent years, Chignik Bay, 2014.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More		Number	Percentage
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage		
Any resource	25	25	25	100.0%	19	76.0%	14	56.0%	3	12.0%		
Chinook salmon	25	25	15	60.0%	10	40.0%	4	16.0%	1	4.0%	10	40.0%
Sockeye salmon	25	25	24	96.0%	13	52.0%	9	36.0%	2	8.0%	1	4.0%
Other salmon	25	25	14	56.0%	4	16.0%	9	36.0%	1	4.0%	11	44.0%

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

a. Valid responses do not include households that did not provide any response.

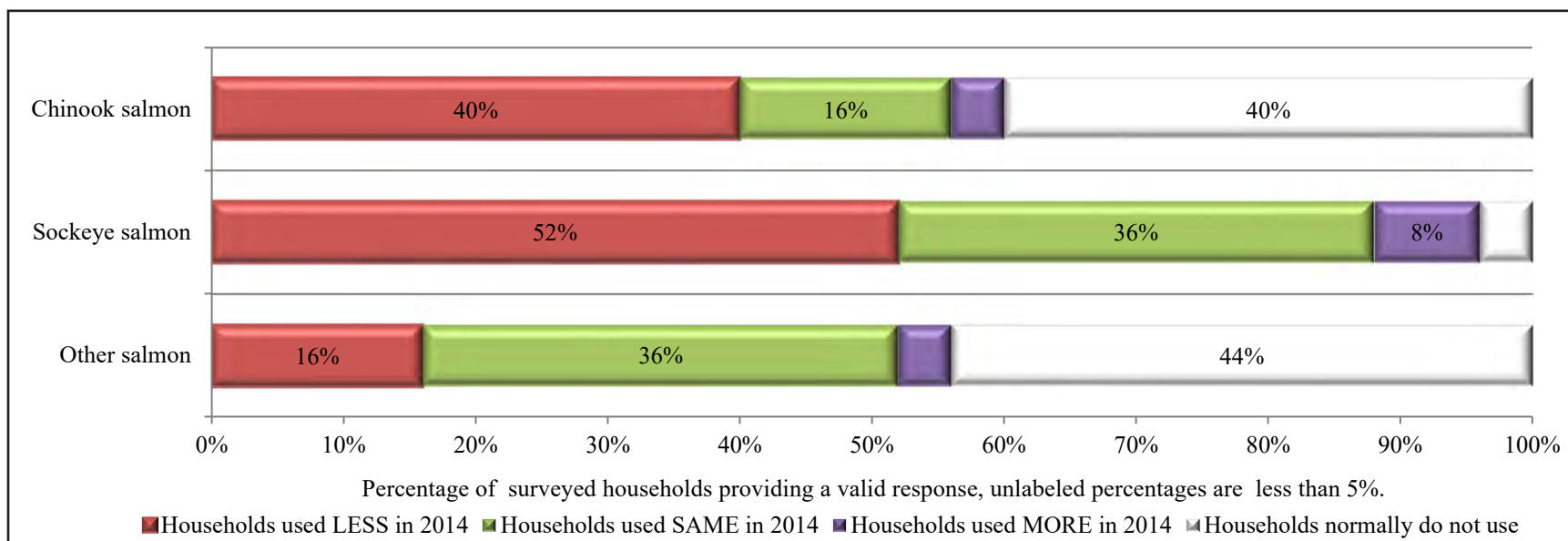


Figure 3-84.—Changes in household uses of salmon compared to recent years, Chignik Bay, 2014.

Table 3-54.—Reasons for less household uses of salmon compared to recent years, Chignik Bay, 2014.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/ personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	25	19	1	5.3%	0	0.0%	7	36.8%	0	0.0%	0	0.0%	10	53%	0	0.0%	5	26.3%
Chinook salmon	25	10	0	0.0%	0	0.0%	5	50.0%	0	0.0%	0	0.0%	5	50%	0	0.0%	2	20.0%
Sockeye salmon	25	13	1	7.7%	0	0.0%	6	46.2%	0	0.0%	0	0.0%	7	54%	0	0.0%	2	15.4%
Other salmon	25	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	75%	0	0.0%	2	50.0%

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Table 3-54.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/ environment		Working/ no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	25	19	0	0.0%	2	10.5%	1	5.3%	0	0.0%	0	0.0%	1	5.3%	0	0.0%	0	0.0%
Chinook salmon	25	10	0	0.0%	1	10.0%	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	25	13	0	0.0%	1	7.7%	0	0.0%	0	0.0%	0	0.0%	1	7.7%	0	0.0%	0	0.0%
Other salmon	25	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

Table 3-55.—Reasons for more household uses of salmon compared to recent years, Chignik Bay, 2014.

Resource	Valid responses ^a	Households reporting reasons for more use	Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	25	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	66.7%	0	0.0%	1	33.3%
Chinook salmon	25	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Sockeye salmon	25	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	100.0%	0	0.0%	0	0.0%
Other salmon	25	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%

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Table 3-55.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	25	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Chinook salmon	25	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	25	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	25	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

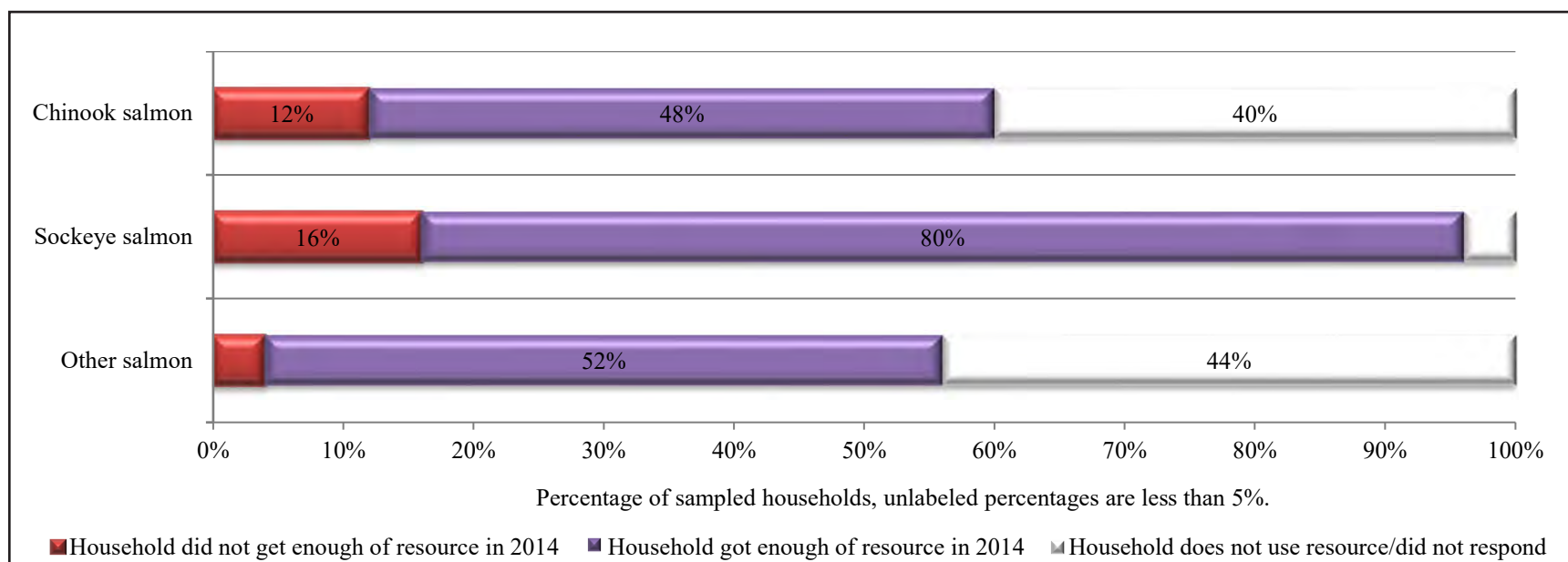


Figure 3-85.—Percentage of sampled households reporting whether they had enough resources, Chignik Bay, 2014.

Table 3-56.—Reported impact to households reporting that they did not get enough of a type of resources, Chignik Bay, 2014.

Resource	Sample households	Households not getting enough				Impact to those not getting enough									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	25	15	60.0%	3	20.0%	0	0.0%	1	33.3%	2	66.7%	0	0.0%	0	0.0%
Sockeye salmon	25	24	96.0%	4	16.7%	1	25.0%	1	25.0%	0	0.0%	2	50.0%	0	0.0%
Other salmon	25	14	56.0%	1	7.1%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-57.—Things households reported doing differently as the result of not getting enough of a resource, Chignik Bay, 2014.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without		Increased effort to harvest	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	4	0	0.0%	4	100.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%
Other salmon	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%

-continued-

Table 3-57.—Continued.

Resource	Valid responses ^a	Got a job		Ate elsewhere		Got public assistance		Conserved resource		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Sockeye Salmon

Of 22 sampled households in Chignik Bay in 2015, 21 provided a response to the sockeye salmon use assessment questions, of which 100% used salmon from the early run, and 91% (19 households) used salmon from the late run (Table 3-58). Of the 21 households that used early-run sockeye salmon in 2015, nine (43%) said they used fewer salmon compared to the recent last five years, 10 (48%) said they used the same amount, and two (10%) used more (Figure 3-86). There were six responding households (29%) that used late-run sockeye salmon less, 11 (52%) used the same amount, and two (10%) used more compared to recent years (Table 3-58; Figure 3-86). The households said they used fewer early-run sockeye salmon for the following reasons: family/personal reasons (three responses), less sharing (three responses), resources too small/diseased (two responses), resources less available (one response), lack of equipment (one response), and lack of effort (one response) (Table 3-59). The six households that used fewer late-run sockeye salmon cited reasons why, which included: fewer fish shared with their households (three responses), family/personal circumstances (one response), weather/environment (one response), and needed less (one response). One household indicated increased effort and another household received more salmon, which is why more early-run sockeye salmon were used in 2014; for late-run sockeye salmon, increased use was the result of receiving more fish (one response) and spending more time to harvest (one response) (Table 3-60).

As described previously, households were asked to evaluate separately if their household obtained enough sockeye salmon from the early run and the late run to meet their needs, and the majority of sampled households had enough sockeye salmon from each run (Figure 3-87). Six of 18 responding households (33%) said they did not get enough early-run sockeye salmon to meet their needs, and two of these households said that the impact of not getting enough was minor, one said it was not noticeable, and one household indicated the household experienced a major impact (Table 3-61). Of the responding households that discussed sockeye salmon from the late run, four (24%) said they did not get enough to meet their needs; one household said this had a major impact on their household, two households said the impact was minor, and one household said the impact was not noticeable. Only two households that needed more early-run sockeye salmon explained what they did differently as a result of not having enough: one household asked others for help, and one household said they increased their effort to harvest (Table 3-62). None of the four households that did not get enough late-run sockeye commented as to what they did differently as a result of not getting enough fish.

Chinook Salmon

In 2015, there were 15 out of 20 responding households (75%) in Chignik Bay that said they used Chinook salmon, of which eight (40%) used fewer fish, four (20%) used the same amount, and three (15%) used more compared to recent previous years (Table 3-58; Figure 3-86). The eight households that used fewer Chinook salmon cited reasons for why use decreased, which included: less sharing (five responses), no time/busy working (two responses), needed less (one response), and one household gave another reason (Table 3-59). The three households that used more Chinook salmon in 2015 each cited a separate reason why: increased availability, more harvest success, and another reason (Table 3-60). Households were asked if they got enough Chinook salmon, either by harvesting or receiving fish, to meet their needs in 2015, and three out of 14 responding households did not get enough to meet their needs; overall, this response indicates 14% of sampled households did not have enough Chinook salmon (Table 3-61; Figure 3-87). One household said not having enough Chinook salmon impacted its members in a minor way, and the other two households said the impact was not noticeable; none provided an explanation of whether they did anything differently as a result of not getting enough (Table 3-61; Table 3-62).

Table 3-58.—Changes in household uses of salmon compared to recent years, Chignik Bay, 2015.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More			
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	22	21	21	100.0%	14	66.7%	14	66.7%	5	23.8%		
Chinook salmon	22	20	15	75.0%	8	40.0%	4	20.0%	3	15.0%	5	25.0%
Sockeye salmon—early run	22	21	21	100.0%	9	42.9%	10	47.6%	2	9.5%	0	0.0%
Sockeye salmon—late run	22	21	19	90.5%	6	28.6%	11	52.4%	2	9.5%	2	9.5%
Other salmon	22	20	13	65.0%	7	35.0%	5	25.0%	1	5.0%	7	35.0%

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

a. Valid responses do not include households that did not provide any response.

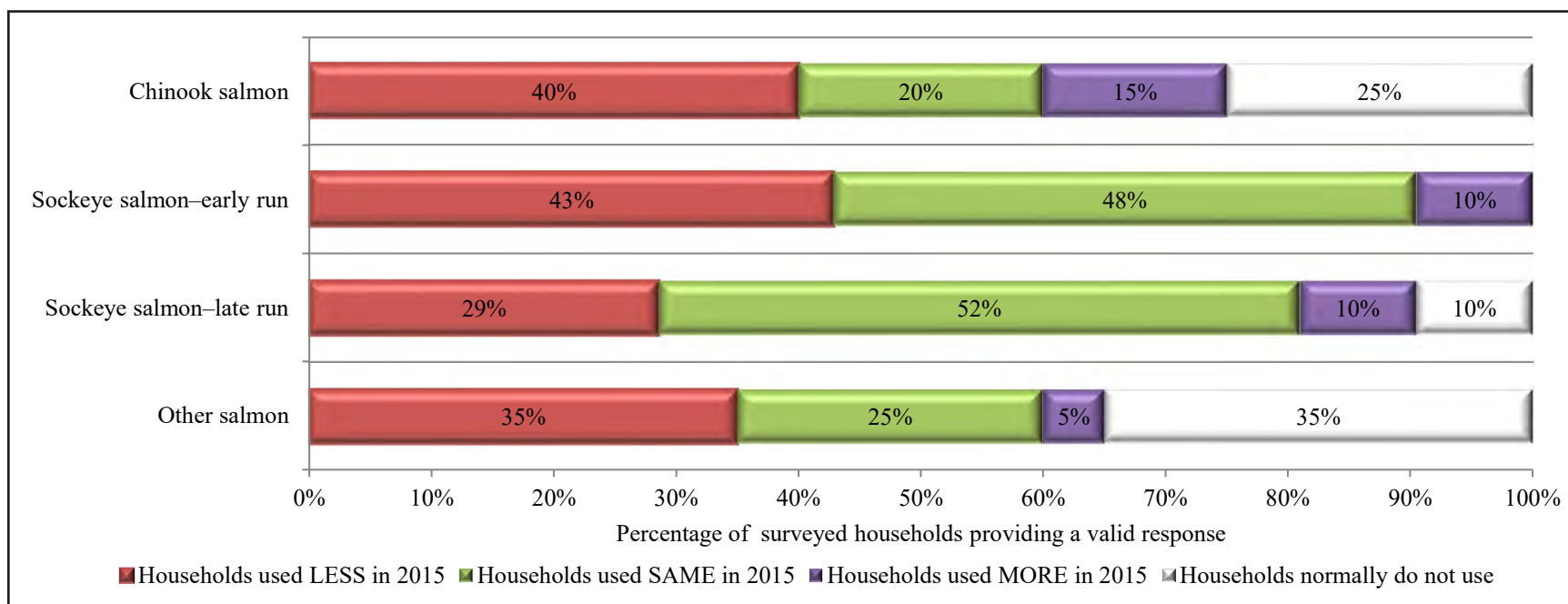


Figure 3-86.—Changes in household uses of salmon compared to recent years, Chignik Bay, 2015.

Table 3-59.—Reasons for less household uses of salmon compared to recent years, Chignik Bay, 2015.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/ personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	21	14	3	21.4%	0	0.0%	1	7.1%	0	0.0%	1	7.1%	7	50.0%	1	7.1%	1	7.1%
Chinook salmon	20	8	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	5	62.5%	0	0.0%	0	0.0%
Sockeye salmon—early run	21	9	3	33.3%	0	0.0%	1	11.1%	0	0.0%	1	11.1%	3	33.3%	1	11.1%	0	0.0%
Sockeye salmon—late run	21	6	1	16.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	50.0%	0	0.0%	0	0.0%
Other salmon	20	6	1	16.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	16.7%

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Table 3-59.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/ environment		Working/ no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	21	14	1	7.1%	4	28.6%	1	7.1%	2	14.3%	0	0.0%	4	28.6%	0	0.0%	1	7.1%
Chinook salmon	20	8	0	0.0%	2	25.0%	0	0.0%	0	0.0%	0	0.0%	1	12.5%	0	0.0%	1	12.5%
Sockeye salmon—early run	21	9	0	0.0%	0	0.0%	0	0.0%	2	22.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	21	6	1	16.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	16.7%	0	0.0%	0	0.0%
Other salmon	20	6	0	0.0%	1	16.7%	1	16.7%	0	0.0%	0	0.0%	2	33.3%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

Table 3-60.—Reasons for more household uses of salmon compared to recent years, Chignik Bay, 2015.

Resource	Valid responses ^a	Households reporting reasons for more use	Family/personal		Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	21	5	0	0.0%	0	0.0%	2	40.0%	0	0.0%	0	0.0%	2	40.0%	1	20.0%	1	20.0%
Chinook salmon	20	3	0	0.0%	0	0.0%	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%
Sockeye salmon—early run	21	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	1	50.0%	0	0.0%
Sockeye salmon—late run	21	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Other salmon	20	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-60.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Had more time		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	21	5	0	0.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%
Chinook salmon	20	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%
Sockeye salmon—early run	21	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	21	2	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	20	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

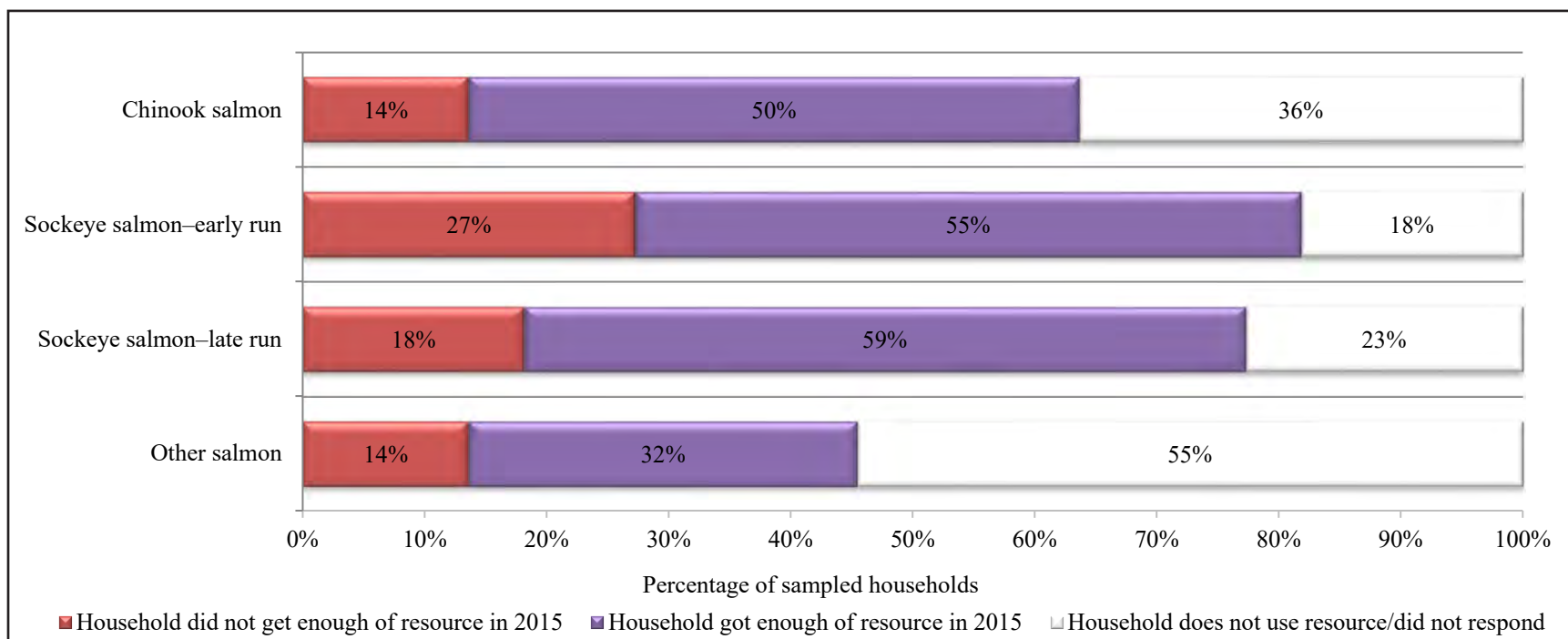


Figure 3-87.—Percentage of sampled households reporting whether they had enough resources, Chignik Bay, 2015.

Table 3-61.—Reported impact to households reporting that they did not get enough of a type of resources, Chignik Bay, 2015.

Resource	Sample households	Households not getting enough				Impact to those not getting enough									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	22	14	63.6%	3	21.4%	0	0.0%	2	66.7%	1	33.3%	0	0.0%	0	0.0%
Sockeye salmon-early run	22	18	81.8%	6	33.3%	2	33.3%	1	16.7%	2	33.3%	1	16.7%	0	0.0%
Sockeye salmon-late run	22	17	77.3%	4	23.5%	0	0.0%	1	25.0%	2	50.0%	1	25.0%	0	0.0%
Other salmon	22	10	45.5%	3	30.0%	1	33.3%	2	66.7%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-62.—Things households reported doing differently as the result of not getting enough of a resource, Chignik Bay, 2015.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	2	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%
Sockeye salmon—late run	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-62.—Continued.

Resource	Valid responses ^a	Increased effort to harvest		Got a job		Ate elsewhere		Got public assistance		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	2	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Other Salmon

Overall, for other salmon (chum, coho, and pink salmon), more responding households used fewer fish in 2015 in Chignik Bay than used more or the same amount compared to the previous five years (Figure 3-86). Out of 13 responding households that used other salmon, seven (35%) decreased use, five (25%) used the same amount, and one (5%) used more (Table 3-58). Of the seven households that used fewer other salmon, six provided a variety of reasons why: needed less (two responses), personal reasons (one response), unsuccessful (one response), working/no time (one response), and regulations (one response) (Table 3-59). The household that used more other salmon attributed it to increased resource availability (Table 3-60). For 2015, about one-third (32%) of sampled households in Chignik Bay had the desired amount of other salmon (Figure 3-87). Out of 10 responding households, three (30%) said they did not get enough other salmon to meet their needs, but two households said the impact of not getting enough was not noticeable, and the other did not provide a response and none responded to the question asking if they did anything differently as a result of needing more (Table 3-61; Table 3-62).

2016

Sockeye Salmon

Of the 24 responding households, seven (29%) used fewer early-run sockeye salmon in 2016 than in the recent last five years, 14 (58%) used the same amount, and two (8%) used more (Table 3-63; Figure 3-88). For late-run sockeye salmon in 2016, one-quarter (25%) of the responding households used the same amount, four (17%) reported less use, no respondents indicated increased use, and 14 households (58%) did not use late-run sockeye salmon. In 2016, early-run sockeye salmon was the only resource for which household use was about the same for at least one-half (58%) of the responding households in Chignik Bay (Figure 3-88). Of the seven households reporting that they used fewer early-run sockeye salmon, the specific reasons provided for why included: family/personal reasons (three responses), resources less available (two responses), lack of equipment (one response), lack of effort (one response), weather/environment (one response), and working/no time (one response) (Table 3-64). Only two households reported using more early-run sockeye salmon and the reasons provided for more use were that the household received more (one response) and affordability (store-bought food too expensive) (one response) (Table 3-65). Reasons provided for why use of late-run sockeye salmon was less included: resources less available (two responses), family/personal reasons (one response), less sharing (one response), and working/no time (one response) (Table 3-64).

A considerably higher proportion of Chignik Bay households had enough early-run sockeye salmon (63%) than late-run sockeye salmon (33%), although the majority of sampled households (58%) did not even use late-run sockeye salmon (Figure 3-89). Of the 23 households that used sockeye salmon from the early run, eight households (35%) did not get enough to meet their needs (Table 3-66). One household said the impact of not getting enough was severe, three reported a major impact to the household, two a minor impact, one indicated it was not noticeable, and one did not provide an impact severity assessment. These eight households were asked to identify what they did differently as a result of not getting enough early-run sockeye salmon in 2016, and out of five responses, one household used other subsistence foods, one household asked others for help, one household made do without, and two households ate elsewhere (Table 3-67). Of the 10 households that used late-run sockeye salmon in the study year, two (20%) said they did not get enough to meet their needs; both households said they experienced a major impact and that they had to buy more commercial foods to make up for not having enough of this resource (Table 3-66; Table 3-67).

Chinook Salmon

In 2016, one-half of 24 sampled households in Chignik Bay used Chinook salmon (Table 3-63). Overall, five households (21%) used fewer Chinook salmon, six households (25%) used the same amount, and one household (4%) used more compared to recent previous years (Table 3-63; Figure 3-88). All five households that used fewer Chinook salmon provided a reason for why: 40% indicated less sharing was

the reason for less use (Table 3-64). The remaining responses were each cited by one household: resource less available, working/no time, and resource was small/diseased. Only one household reported using more Chinook salmon than in recent years, which was because more Chinook salmon were needed (Table 3-65).

In Chignik Bay, a slightly higher proportion of sampled households had enough Chinook salmon than indicated more were needed (Figure 3-89). Five out of 12 households that used the resource did not get enough to meet their needs, of which two households said the impact was major, two said the impact was minor, and one said the impact was not noticeable (Table 3-66). As a result of not getting enough Chinook salmon, two households said that they used more commercial foods and the third household made do without (Table 3-67).

Other Salmon

When asked to compare use of other salmon, 20 out of 24 sampled households in Chignik Bay provided a response: 10 households (50%) used at least one or more of these species of salmon (Table 3-63). Eight responding households (40%) used fewer other salmon and two households (10%) used the same amount in 2016 compared to recent years; no respondents used more chum, pink, and coho salmon combined. Reasons households gave for using fewer other salmon included: resources less available (two responses), weather/environment (two responses), personal reasons (one response), unsuccessful harvest effort (one response), used other resources (one response), and needed fewer other salmon (one response) (Table 3-64).

In the 2016 study year, nine households (38%) out of 24 sampled households provided an assessment about having enough other salmon, of which three households (33%) said they did not get enough to meet their needs (Table 3-66). Two households said the impact of not getting enough other salmon was major and one household said the impact was not noticeable. What households did differently as a result of not getting enough other salmon included using more commercial foods (three responses) and asking others for help (one response) (Table 3-67).

Table 3-63.—Changes in household uses of salmon compared to recent years, Chignik Bay, 2016.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More		Number	Percentage
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage		
Any resource	24	24	23	95.8%	13	54.2%	18	75.0%	2	8.3%		
Chinook salmon	24	24	12	50.0%	5	20.8%	6	25.0%	1	4.2%	12	50.0%
Sockeye salmon—early run	24	24	23	95.8%	7	29.2%	14	58.3%	2	8.3%	1	4.2%
Sockeye salmon—late run	24	24	10	41.7%	4	16.7%	6	25.0%	0	0.0%	14	58.3%
Other salmon	24	20	10	50.0%	8	40.0%	2	10.0%	0	0.0%	10	50.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

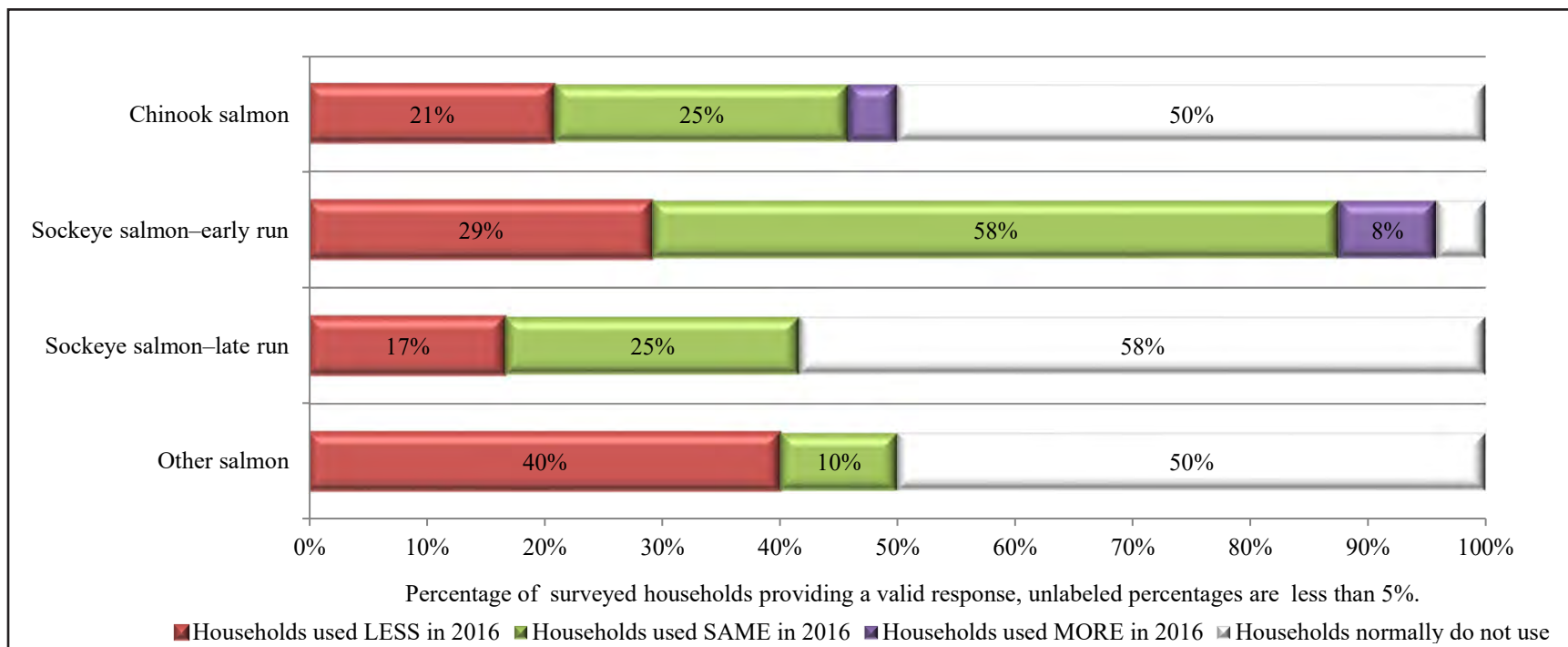


Figure 3-88.—Changes in household uses of salmon compared to recent years, Chignik Bay, 2016.

Table 3-64.—Reasons for less household uses of salmon compared to recent years, Chignik Bay, 2016.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/ personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	24	13	4	30.8%	1	7.7%	5	38.5%	0	0.0%	1	8%	2	15.4%	1	7.7%	1	7.7%
Chinook salmon	24	5	0	0.0%	0	0.0%	1	20.0%	0	0.0%	0	0%	2	40.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	24	7	3	42.9%	0	0.0%	2	28.6%	0	0.0%	1	14%	0	0.0%	1	14.3%	0	0.0%
Sockeye salmon—late run	24	4	1	25.0%	0	0.0%	2	50.0%	0	0.0%	0	0%	1	25.0%	0	0.0%	0	0.0%
Other salmon	20	8	1	12.5%	1	12.5%	2	25.0%	0	0.0%	0	0%	0	0.0%	0	0.0%	1	12.5%

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Table 3-64.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/ environment		Working/ no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	24	13	3	23.1%	2	15.4%	0	0.0%	1	7.7%	0	0.0%	1	7.7%	0	0.0%	1	7.7%
Chinook salmon	24	5	0	0.0%	1	20.0%	0	0.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	24	7	1	14.3%	1	14.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	14.3%
Sockeye salmon—late run	24	4	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	20	8	2	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	12.5%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

Table 3-65.—Reasons for more household uses of salmon compared to recent years, Chignik Bay, 2016.

Resource	Valid responses ^a	Households reporting reasons for more use	Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	24	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Chinook salmon	24	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	24	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	24	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	20	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-65.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Had more time		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	24	2	0	0.0%	0	0.0%	0	0.0%	1	50.0%	1	50.0%	0	0.0%	0	0.0%
Chinook salmon	24	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	24	2	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	24	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	20	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

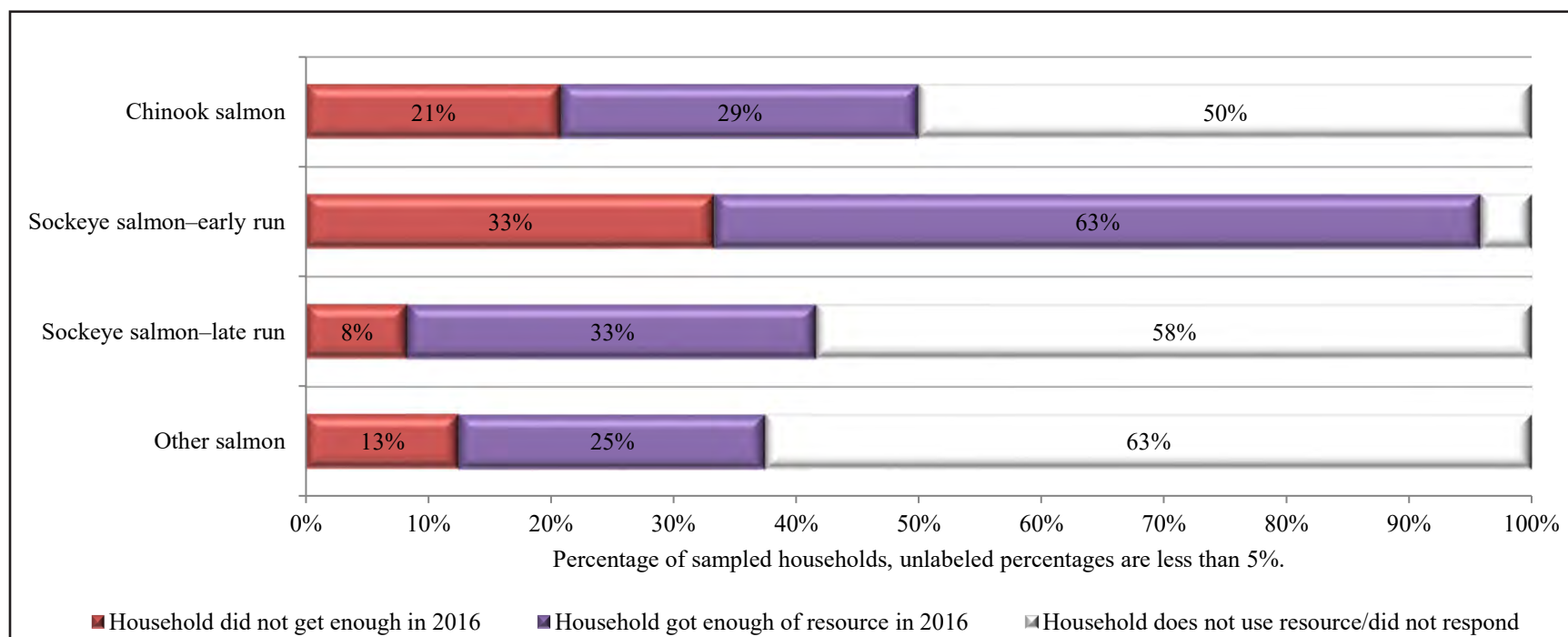


Figure 3-89.—Percentage of sampled households reporting whether they had enough resources, Chignik Bay, 2016.

Table 3-66.—Reported impact to households reporting that they did not get enough of a type of resources, Chignik Bay, 2016.

Resource	Sample households	Households not getting enough				Impact to those not getting enough									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	24	12	50.0%	5	41.7%	0	0.0%	1	20.0%	2	40.0%	2	40.0%	0	0.0%
Sockeye salmon-early run	24	23	95.8%	8	34.8%	1	12.5%	1	12.5%	2	25.0%	3	37.5%	1	12.5%
Sockeye salmon-late run	24	10	41.7%	2	20.0%	0	0.0%	0	0.0%	0	0.0%	2	100.0%	0	0.0%
Other salmon	24	9	37.5%	3	33.3%	0	0.0%	1	33.3%	0	0.0%	2	66.7%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-67.—Things households reported doing differently as the result of not getting enough of a resource, Chignik Bay, 2016.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	3	0	0.0%	2	66.7%	0	0.0%	0	0.0%	1	33.3%
Sockeye salmon—early run	5	0	0.0%	0	0.0%	1	20.0%	1	20.0%	1	20.0%
Sockeye salmon—late run	2	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	3	0	0.0%	3	100.0%	0	0.0%	1	33.3%	0	0.0%

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Table 3-67.—Continued.

Resource	Valid responses ^a	Increased effort to harvest		Got a job		Ate elsewhere		Got public assistance		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	5	0	0.0%	0	0.0%	2	40.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

Note Respondents could provide more than one response, so the percentages may sum to more than 100%.

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Chignik Lagoon

2014

Sockeye Salmon

Of 16 sampled households in Chignik Lagoon in 2014, 100% used sockeye salmon, and 50% (eight households) said they used fewer sockeye salmon in the study year, 44% (seven households) used the same amount, and 6% (one household) used more compared to the previous five or so years (Table 3-68; Figure 3-90). The main reason cited for why use was less was that sockeye salmon were less available (five responses) (Table 3-69). Also, two households indicated family/personal reasons led to less use of sockeye salmon, and each of the following reasons was cited by one household: lack of equipment, lack of effort, working or no time, and another reason. Only one household said they used more sockeye salmon and the reason for increased use was that the household needed more than in previous years (Table 3-70).

In Chignik Lagoon, slightly more than the majority of sampled households (56%) had enough sockeye salmon resources through either harvests or receiving fish (Figure 3-91). Seven households (44%) did not get enough sockeye salmon to meet their needs in 2014; one household (14%) said the impact of not getting enough was severe, three households (43%) said it was major, and three households (43%) said the effect was minor (Table 3-71). These households were asked to explain what they did differently as a result of not getting enough sockeye salmon in 2014 (households could give more than one response), and responses included: used more commercial foods (five responses), replaced sockeye salmon with other subsistence foods (two responses), and made do without (one response) (Table 3-72).

Chinook Salmon

Chinook salmon is the resource for which the highest proportion of households experienced less use (Figure 3-90). In 2014 in Chignik Lagoon, 81% of households (13) used Chinook salmon; most households (10, or 63%) said they used fewer Chinook salmon compared to recent years, three households (19%) used the same amount, and none used more (Table 3-68). The reason mainly cited (by 70% of households that decreased use) for a decrease in the use of Chinook salmon was that the resource was less available (Table 3-69). A variety of other reasons were also cited by one or two households each: lack of effort, regulations, needed less, lack of equipment, less sharing, and weather/environment. One-half of sampled households thought that they did not have enough Chinook salmon in 2014 (Figure 3-91). Out of eight households that did not get enough Chinook salmon, one household said the impact was major, five said the impact was minor, and one household did not notice effects from not having enough Chinook salmon (Table 3-71). Households that did not have enough were asked what they did differently to make up for the loss, and responses included: replaced with other subsistence foods (three responses) and used more commercial foods (two responses) (Table 3-72).

Other Salmon

Only 50% of households, or eight out of 16 sampled Chignik Lagoon households, used other salmon; 25% (four households) used fewer chum, coho, and pink salmon combined, and 25% (four households) used the same amount, and none used more of other salmon species compared to the previous five or so years (Table 3-68; Figure 3-90). Households that used fewer other salmon indicated it was due to the following reasons: lack of effort (three responses) and resources were less available (one response) (Table 3-69). Out of eight households that used other salmon species in 2014, three (38%) did not get enough to meet their needs, and one household said the impact was major, one experienced a minor effect, and one household indicated a lack of other salmon was not noticeable (Table 3-71). Only two households indicated what they did differently as a result of not getting enough other salmon: one used more commercial foods, and one made do without (Table 3-72).

Table 3-68.—Changes in household uses of salmon compared to recent years, Chignik Lagoon, 2014.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More		Number	Percentage
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage		
Any resource	16	16	16	100.0%	13	81.3%	10	62.5%	1	6.3%		
Chinook salmon	16	16	13	81.3%	10	62.5%	3	18.8%	0	0.0%	3	18.8%
Sockeye salmon	16	16	16	100.0%	8	50.0%	7	43.8%	1	6.3%	0	0.0%
Other salmon	16	16	8	50.0%	4	25.0%	4	25.0%	0	0.0%	8	50.0%

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

a. Valid responses do not include households that did not provide any response.

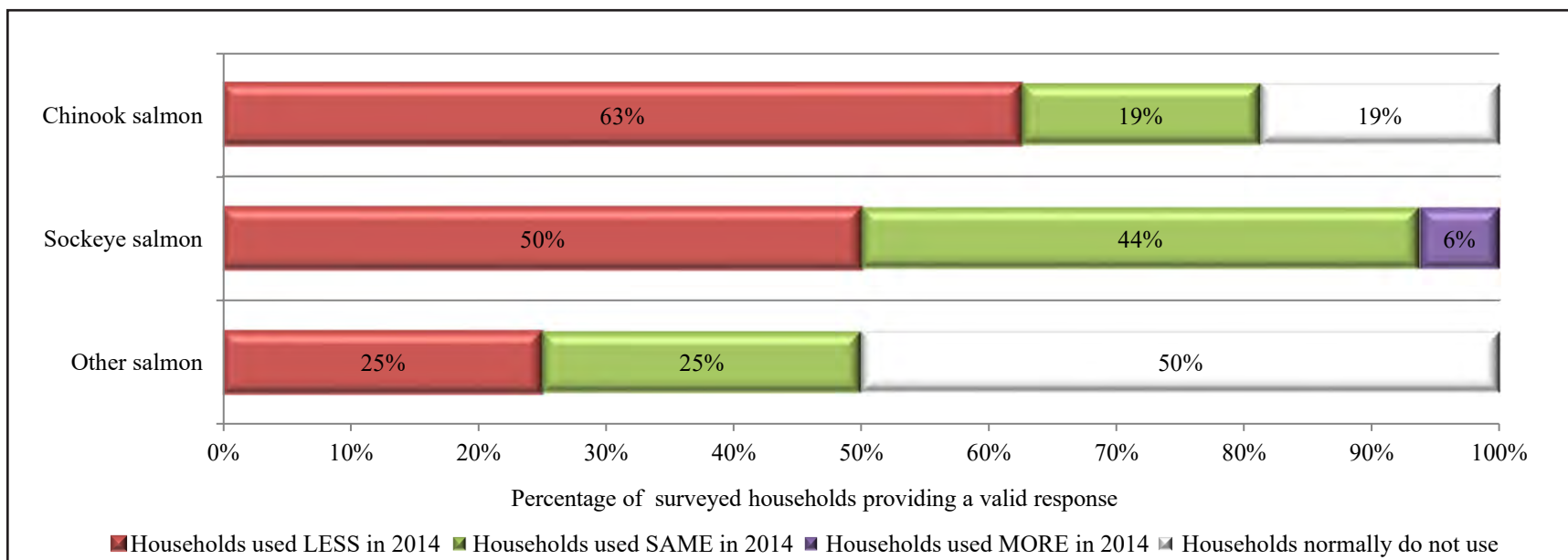


Figure 3-90.—Changes in household uses of salmon compared to recent years, Chignik Lagoon, 2014.

Table 3-69.—Reasons for less household uses of salmon compared to recent years, Chignik Lagoon, 2014.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/ personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	16	13	2	15.4%	0	0.0%	10	76.9%	0	0.0%	1	7.7%	1	7.7%	5	38.5%	0	0.0%
Chinook salmon	16	10	0	0.0%	0	0.0%	7	70.0%	0	0.0%	1	10.0%	1	10.0%	2	20.0%	0	0.0%
Sockeye salmon	16	8	2	25.0%	0	0.0%	5	62.5%	0	0.0%	1	12.5%	0	0.0%	1	12.5%	0	0.0%
Other salmon	16	4	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	3	75.0%	0	0.0%

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Table 3-69.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/ environment		Working/ no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	16	13	1	7.7%	1	7.7%	2	15.4%	0	0.0%	0	0.0%	2	15.4%	0	0.0%	1	7.7%
Chinook salmon	16	10	1	10.0%	0	0.0%	2	20.0%	0	0.0%	0	0.0%	2	20.0%	0	0.0%	0	0.0%
Sockeye salmon	16	8	0	0.0%	1	12.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	12.5%
Other salmon	16	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

Table 3-70.—Reasons for more household uses of salmon compared to recent years, Chignik Lagoon, 2014.

Resource	Valid responses ^a	Households reporting reasons for more use	Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	16	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Chinook salmon	16	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	16	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	16	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-70.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	16	1	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Chinook salmon	16	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	16	1	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Other salmon	16	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

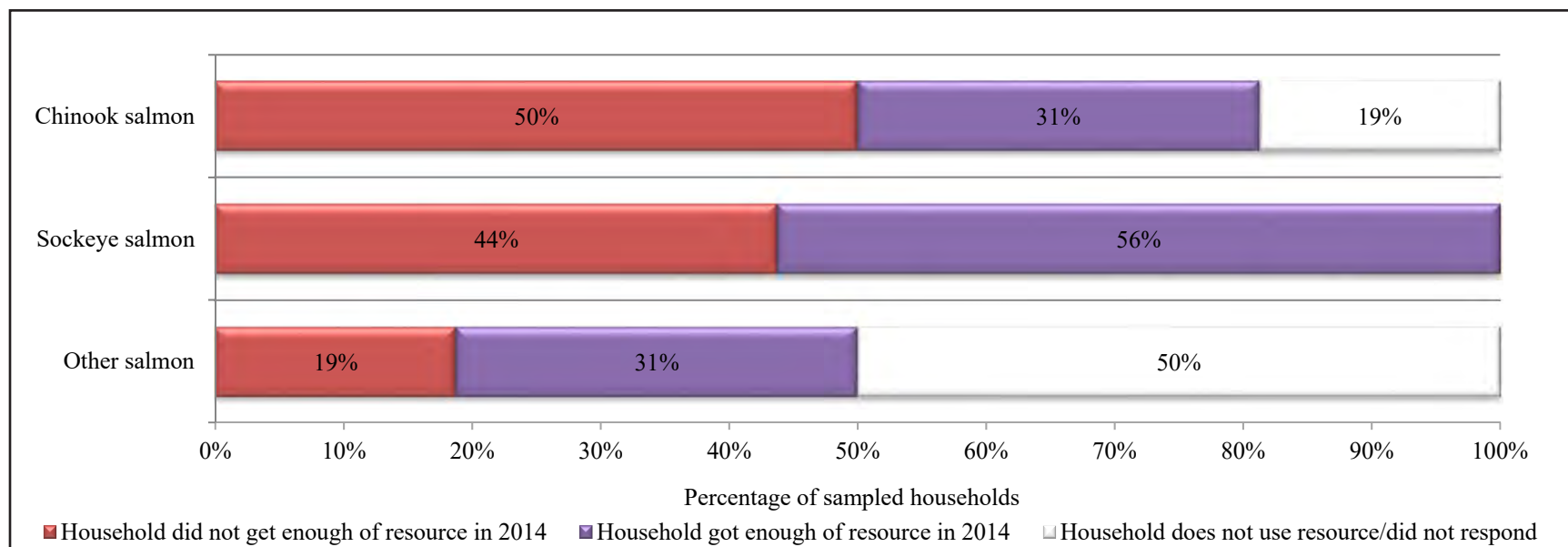


Figure 3-91.—Percentage of sampled households reporting whether they had enough resources, Chignik Lagoon, 2014.

Table 3-71.—Reported impact to households reporting that they did not get enough of a type of resources, Chignik Lagoon, 2014.

Resource	Sample households	Households not getting enough				Impact to those not getting enough									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	16	13	81.3%	8	61.5%	1	12.5%	1	12.5%	5	62.5%	1	12.5%	0	0.0%
Sockeye salmon	16	16	100.0%	7	43.8%	0	0.0%	0	0.0%	3	42.9%	3	42.9%	1	14.3%
Other salmon	16	8	50.0%	3	37.5%	0	0.0%	1	33.3%	1	33.3%	1	33.3%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-72.—Things households reported doing differently as the result of not getting enough of a resource, Chignik Lagoon, 2014.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without		Increased effort to harvest	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	4	0	0.0%	2	50.0%	3	75.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	7	0	0.0%	5	71.4%	2	28.6%	0	0.0%	1	14.3%	0	0.0%
Other salmon	2	0	0.0%	1	50.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%

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Table 3-72.—Continued.

Resource	Valid responses ^a	Got a job		Ate elsewhere		Got public assistance		Conserved resource		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	4	0	0.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%
Sockeye salmon	7	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Sockeye Salmon

Of 18 households that answered use assessment questions for both early-run and late-run sockeye salmon, all households (100%) used fish from the first run and 16 households (89%) used late-run salmon (Table 3-73). In comparison to the late-run use assessment, a higher proportion of those 18 households considered their use of early-run sockeye salmon less than in recent previous years (Figure 3-92). Only three households, or 17% of the responding households, considered their use of early-run sockeye salmon to be about the same; eight responding households thought they used less early-run sockeye salmon, but nearly as many (seven) households thought use increased in 2015 (Table 3-73). For the late run, five responding households (28%) decreased use, two (11%) used the same amount, and nine (50%) used more.

Not quite all the households that reported using a decreased amount of sockeye salmon from either run provided a reason for why, and generally the reasons differed by run (Table 3-74). Regarding using fewer early-run fish, the primary reason was that the resource was small or diseased (three responses); the other reasons were that the resource was less available, less sharing, lack of effort, and unsuccessful harvest effort (one response for each). Households that provided a reason for using fewer late-run sockeye salmon said that personal or family reasons (two responses), weather or environment (one response), time spent working (one response), and another reason (one response) were a cause. All the households that used more sockeye salmon provided at least one reason for why, and the reasons for why aligned between the two run resources (Table 3-75). There were four households that indicated needing more fish was a reason for increased use for both the first run and the second run; two households indicated increased resource availability for the early run, and one household cited the same for the second run; and having more time allowed one household to harvest more early-run sockeye and two households to harvest more late-run sockeye salmon. Additional reasons provided by households that used more late-run sockeye salmon included favorable weather (two responses); also, used other resources and received more (one response each) were cited.

The proportion of sampled households that had enough sockeye salmon was similar for both the early run and late run: 53% had enough early-run and 47% had enough late-run sockeye salmon (Figure 3-93). Eight of 18 (44%) responding households said they did not get enough early-run sockeye salmon to meet their needs, and two households said the impact of not getting enough was severe, two households said the effect was major, two households indicated a minor impact, one household thought it was not noticeable, and one household did not respond (Table 3-76). Six of 15 responding households said they did not get enough late-run salmon to meet their needs, and, of these households, one said the impact was severe, one said it was major, two experienced a minor effect, and two households said it was not noticeable. For both early-run and late-run sockeye salmon, households generally used more commercial foods (two responses and three responses, respectively); additionally, three households replaced early-run sockeye salmon with other subsistence foods (Table 3-77).

Chinook Salmon

In Chignik Lagoon, 18 out of 19 (95%) sampled households said they used Chinook salmon in 2015, of which more than one-half (53%, or eight households) used fewer fish, 32% (six households) used the same amount, and 11% (two households) used more compared to recent previous years (Table 3-73; Figure 3-92). Eight of the 10 households that used fewer Chinook salmon gave reasons for why their use was decreased, which were: less sharing (three responses), lack of effort (three responses), busy working/no time (two responses), and one response for each of the remaining reasons—resource less available, regulations, needed less, and other (Table 3-74). The two households that used more Chinook salmon did so because they received more (one response) and increased effort (one response) (Table 3-75). Overall, the majority (53%) of sampled households had enough Chinook salmon (Figure 3-93). Out of eight households that did not get enough Chinook salmon to meet their needs, one household said the impact of not getting enough was major, three said the impact was minor, and four said it was not noticeable (Table 3-76). Only two

households provided a response about what the household did differently as a result of not getting enough Chinook salmon: one used more commercial foods, and the other used other subsistence foods (Table 3-77).

Other Salmon

Eight out of 19 (42%) sampled households used other salmon; 11% (two households) used fewer chum, pink, and coho salmon overall; 11% (two households) used the same amount, and 21% (four households) used more of other salmon species compared to the previous five or so years (Table 3-73; Figure 3-92). One household said they used fewer because of lack of effort, and another household said they were unsuccessful with catching these salmon resources (Table 3-74). One-half of the four households that used more other salmon had more harvest success, one household used other resources, and one cited another reason for increased use of other salmon (Table 3-75). There were no households that reported not getting enough other salmon to meet their needs in 2015 (Figure 3-93; Table 3-76)

Table 3-73.—Changes in household uses of salmon compared to recent years, Chignik Lagoon, 2015.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More			
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	19	19	18	94.7%	15	78.9%	10	52.6%	13	68.4%		
Chinook salmon	19	19	18	94.7%	10	52.6%	6	31.6%	2	10.5%	1	5.3%
Sockeye salmon—early run	19	18	18	100.0%	8	44.4%	3	16.7%	7	38.9%	0	0.0%
Sockeye salmon—late run	19	18	16	88.9%	5	27.8%	2	11.1%	9	50.0%	2	11.1%
Other salmon	19	19	8	42.1%	2	10.5%	2	10.5%	4	21.1%	11	57.9%

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

a. Valid responses do not include households that did not provide any response.

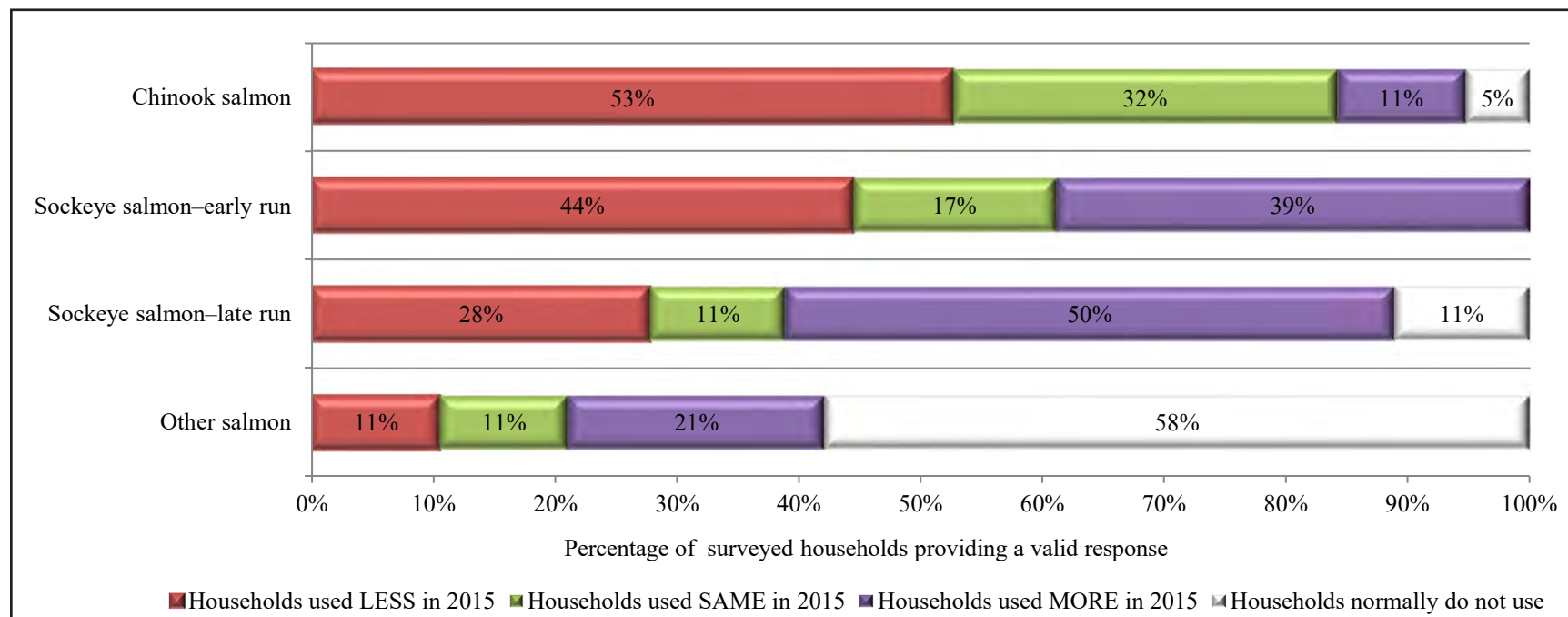


Figure 3-92.—Changes in household uses of salmon compared to recent years, Chignik Lagoon, 2015.

Table 3-74.—Reasons for less household uses of salmon compared to recent years, Chignik Lagoon, 2015.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	19	14	2	14.3%	0	0.0%	2	14.3%	0	0.0%	0	0.0%	3	21.4%	4	28.6%	2	14.3%
Chinook salmon	19	8	0	0.0%	0	0.0%	1	12.5%	0	0.0%	0	0.0%	3	37.5%	3	37.5%	0	0.0%
Sockeye salmon—early run	18	7	0	0.0%	0	0.0%	1	14.3%	0	0.0%	0	0.0%	1	14.3%	1	14.3%	1	14.3%
Sockeye salmon—late run	18	4	2	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	19	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	1	50.0%

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Table 3-74.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/environment		Working/no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	19	14	1	7.1%	4	28.6%	1	7.1%	3	21.4%	0	0.0%	1	7.1%	0	0.0%	2	14.3%
Chinook salmon	19	8	0	0.0%	2	25.0%	1	12.5%	0	0.0%	0	0.0%	1	12.5%	0	0.0%	1	12.5%
Sockeye salmon—early run	18	7	0	0.0%	0	0.0%	0	0.0%	3	42.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	18	4	1	25.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	25.0%
Other salmon	19	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

Table 3-75.—Reasons for more household uses of salmon compared to recent years, Chignik Lagoon, 2015.

Resource	Valid responses ^a	Households reporting reasons for more use	Family/personal		Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	19	13	0	0.0%	1	7.7%	2	15.4%	0	0.0%	0	0.0%	2	15.4%	1	7.7%	2	15.4%
Chinook salmon	19	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	1	50.0%	0	0.0%
Sockeye salmon—early run	18	7	0	0.0%	0	0.0%	2	28.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	18	9	0	0.0%	1	11.1%	1	11.1%	0	0.0%	0	0.0%	1	11.1%	0	0.0%	0	0.0%
Other salmon	19	4	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	50.0%

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Table 3-75.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Had more time		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	19	13	2	15.4%	3	23.1%	0	0.0%	0	0.0%	5	38.5%	0	0.0%	1	7.7%
Chinook salmon	19	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	18	7	0	0.0%	1	14.3%	0	0.0%	0	0.0%	4	57.1%	0	0.0%	1	14.3%
Sockeye salmon—late run	18	9	2	22.2%	2	22.2%	0	0.0%	0	0.0%	4	44.4%	0	0.0%	0	0.0%
Other salmon	19	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	25.0%

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

a. Valid responses do not include households that did not provide any response.

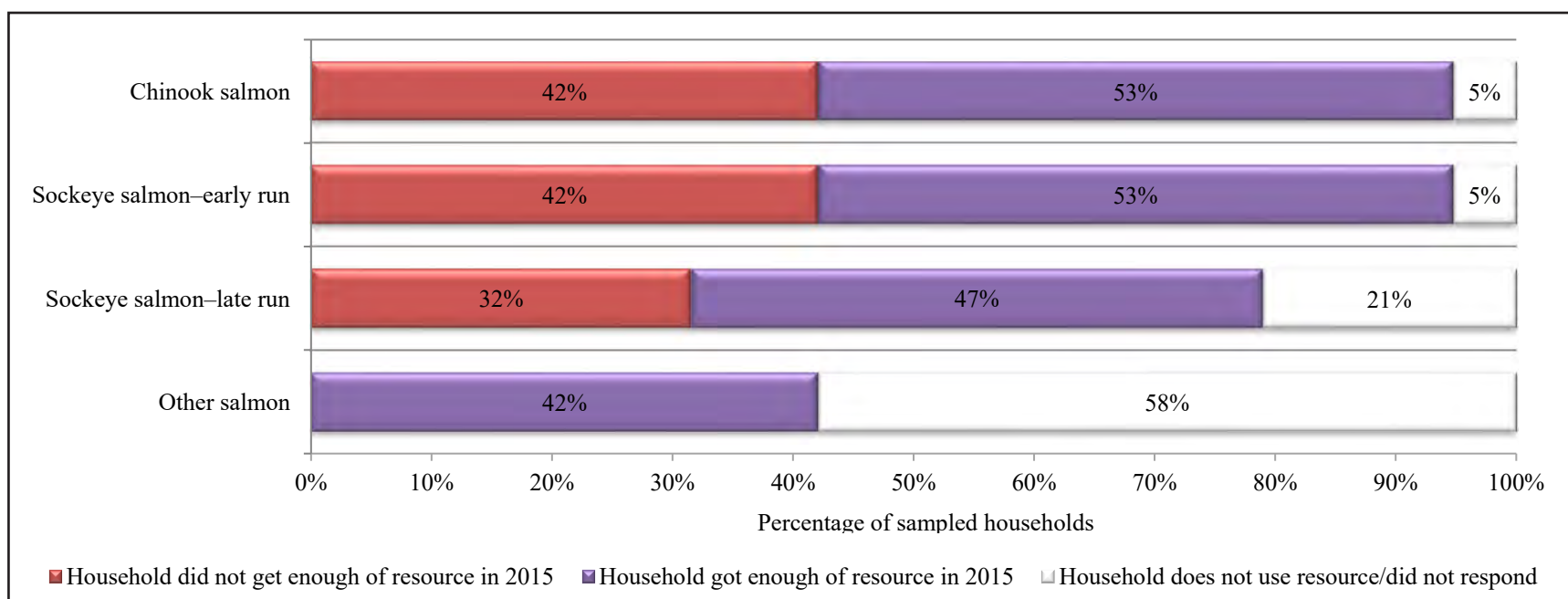


Figure 3-93.—Percentage of sampled households reporting whether they had enough resources, Chignik Lagoon, 2015.

Table 3-76.—Reported impact to households reporting that they did not get enough of a type of resources, Chignik Lagoon, 2015.

Resource	Sample households	Households not getting enough				Impact to those not getting enough									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	19	18	94.7%	8	44.4%	0	0.0%	4	50.0%	3	37.5%	1	12.5%	0	0.0%
Sockeye salmon-early run	19	18	94.7%	8	44.4%	1	12.5%	1	12.5%	2	25.0%	2	25.0%	2	25.0%
Sockeye salmon-late run	19	15	78.9%	6	40.0%	0	0.0%	2	33.3%	2	33.3%	1	16.7%	1	16.7%
Other salmon	19	8	42.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-77.—Things households reported doing differently as the result of not getting enough of a resource, Chignik Lagoon, 2015.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	2	0	0.0%	1	50.0%	1	50.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	5	0	0.0%	2	40.0%	3	60.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	3	0	0.0%	3	100.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-77.—Continued.

Resource	Valid responses ^a	Increased effort to harvest		Got a job		Ate elsewhere		Got public assistance		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	5	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Sockeye Salmon

Of 20 sampled households in Chignik Lagoon, 85% (17 households) reported using early-run sockeye salmon and 75% (15 households) used late-run sockeye salmon in 2016 (Table 3-78). Approximately one-third of households indicated using the same amount of early-run and late-run sockeye salmon (30% and 35%, respectively) (Figure 3-94). In 2016, 45% of households (nine) used fewer early-run sockeye salmon than in the previous five years and 10% of households (two) used more (Table 3-78). For late-run sockeye salmon, 20% of households (four) used fewer fish and 20% of households (four) used more than in recent years. Most households (56%) that used fewer early-run sockeye salmon cited working/no time as the reason why (Table 3-79). Additionally, two households cited personal/family reasons, and the following reasons were each cited by one household: lack of equipment, lack of effort, unsuccessful, needed less, and competition. The reasons given for increased use by the two households using more early-run sockeye salmon were needed more (one response) and had more time (one response) (Table 3-80). There were three households that reported a reason for using fewer late-run sockeye salmon than in recent years, which included: working or no time (two responses), lack of effort (one response), and another reason (one response) (Table 3-79). All four households that used more late-run sockeye salmon provided a reason why, which included: increased effort (two responses), needed more (one response), and had more time (one response) (Table 3-80).

For both sockeye salmon runs, 20% of sampled households did not have enough (Figure 3-95). All 17 households that used early-run sockeye salmon provided an assessment about having enough of this resource: four households did not get enough to meet their needs, and two households said the impact of not getting enough was minor while one household indicated it was not noticeable (Table 3-81). Three of the four households that assessed not having enough early-run sockeye salmon described what the household did as the result of not having enough of this resource: two households used other subsistence foods and one household increased harvest effort in 2016 (Table 3-82). Four households (29%) of 14 responding households did not get enough late-run sockeye salmon to meet their needs, and one household said the impact to the household was major while three households said the impact was minor (Table 3-81). One household indicated using more commercial foods and using other subsistence foods to help make up for lacking a sufficient supply of late-run sockeye salmon through harvesting or sharing in 2016 (Table 3-82).

Chinook Salmon

In 2016 in Chignik Lagoon, 15 (75%) out of 20 sampled households used Chinook salmon (Table 3-78). Overall, eight households (40%) used fewer fish, four (20%) used the same amount, and three (15%) used more compared to recent years (Figure 3-94). Of the households that used less of this resource, reasons why included: working/no time (three responses), needed less (two responses), and the following reasons were each cited by one respondent—family/personal reasons, too far to travel to get fish, unsuccessful, and another reason (Table 3-79). Three households cited four reasons for using more Chinook salmon: increased availability of the resource, increased effort, had more time, and another reason (Table 3-80).

Nearly one-third (30%) of sampled households did not have enough Chinook salmon to meet household needs (Figure 3-95). Six households, or 40% of households that used Chinook salmon, did not have enough of this resource, and most (four households) said the impact to the households was minor; additionally, one household experienced a major impact from needing more Chinook salmon, but one household thought it was not noticeable (Table 3-81). Four households indicated what they did differently after not having enough Chinook salmon, which included: used other subsistence foods (three responses) and asked others for help (one response) (Table 3-82).

Table 3-78.—Changes in household uses of salmon compared to recent years, Chignik Lagoon, 2016.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More			
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	20	20	18	90.0%	13	65.0%	11	55.0%	8	40.0%		
Chinook salmon	20	20	15	75.0%	8	40.0%	4	20.0%	3	15.0%	5	25.0%
Sockeye salmon—early run	20	20	17	85.0%	9	45.0%	6	30.0%	2	10.0%	3	15.0%
Sockeye salmon—late run	20	20	15	75.0%	4	20.0%	7	35.0%	4	20.0%	5	25.0%
Other salmon	20	19	6	31.6%	2	10.5%	4	21.1%	0	0.0%	13	68.4%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

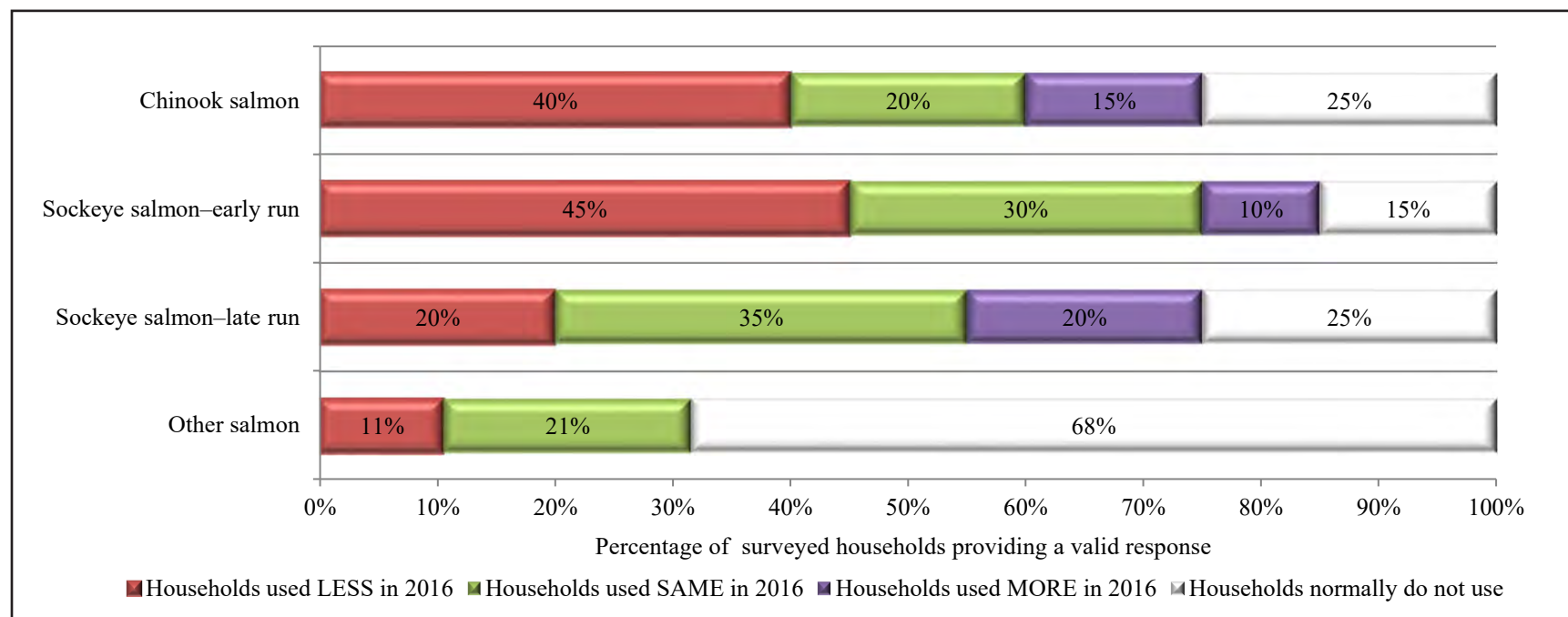


Figure 3-94.—Changes in household uses of salmon compared to recent years, Chignik Lagoon, 2016.

Table 3-79.—Reasons for less household uses of salmon compared to recent years, Chignik Lagoon, 2016.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/ personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	20	12	2	16.7%	0	0.0%	0	0.0%	1	8.3%	2	16.7%	0	0.0%	1	8.3%	2	16.7%
Chinook salmon	20	8	1	12.5%	0	0.0%	0	0.0%	1	12.5%	0	0.0%	0	0.0%	0	0.0%	1	12.5%
Sockeye salmon—early run	20	9	2	22.2%	0	0.0%	0	0.0%	0	0.0%	1	11.1%	0	0.0%	1	11.1%	1	11.1%
Sockeye salmon—late run	20	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%	0	0.0%
Other salmon	19	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-79.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/ environment		Working/ no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	20	12	0	0.0%	5	41.7%	0	0.0%	0	0.0%	0	0.0%	3	25.0%	1	8.3%	1	8.3%
Chinook salmon	20	8	0	0.0%	3	37.5%	0	0.0%	0	0.0%	0	0.0%	2	25.0%	0	0.0%	1	12.5%
Sockeye salmon—early run	20	9	0	0.0%	5	55.6%	0	0.0%	0	0.0%	0	0.0%	1	11.1%	1	11.1%	0	0.0%
Sockeye salmon—late run	20	3	0	0.0%	2	66.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%
Other salmon	19	2	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

Table 3-80.—Reasons for more household uses of salmon compared to recent years, Chignik Lagoon, 2016.

Resource	Valid responses ^a	Households reporting reasons for more use	Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	20	8	0	0.0%	1	12.5%	0	0.0%	0	0.0%	0	0.0%	3	37.5%	0	0.0%
Chinook salmon	20	3	0	0.0%	1	33.3%	0	0.0%	0	0.0%	0	0.0%	1	33.3%	0	0.0%
Sockeye salmon—early run	20	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	20	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	50.0%	0	0.0%
Other salmon	19	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-80.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Had more time		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	20	8	0	0.0%	3	37.5%	0	0.0%	0	0.0%	2	25.0%	0	0.0%	1	12.5%
Chinook salmon	20	3	0	0.0%	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%
Sockeye salmon—early run	20	2	0	0.0%	1	50.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	20	4	0	0.0%	1	25.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%
Other salmon	19	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

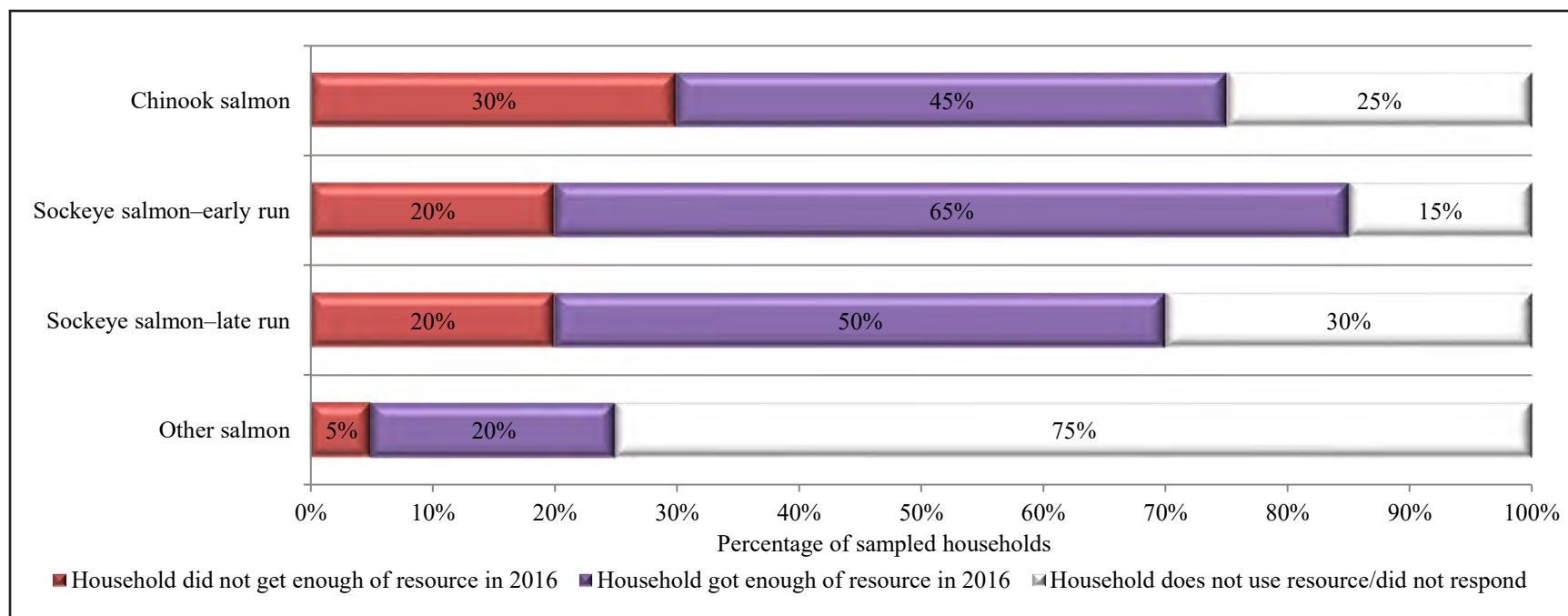


Figure 3-95.—Percentage of sampled households reporting whether they had enough resources, Chignik Lagoon, 2016.

Table 3-81.—Reported impact to households reporting that they did not get enough of a type of resources, Chignik Lagoon, 2016.

Resource	Sample households	Households not getting enough				Impact to those not getting enough									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	20	15	75.0%	6	40.0%	0	0.0%	1	16.7%	4	66.7%	1	16.7%	0	0.0%
Sockeye salmon-early run	20	17	85.0%	4	23.5%	1	25.0%	1	25.0%	2	50.0%	0	0.0%	0	0.0%
Sockeye salmon-late run	20	14	70.0%	4	28.6%	0	0.0%	0	0.0%	3	75.0%	1	25.0%	0	0.0%
Other salmon	20	5	25.0%	1	20.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%

Source: ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-82.—Things households reported doing differently as the result of not getting enough of a resource, Chignik Lagoon, 2016.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	4	0	0.0%	0	0.0%	3	75.0%	1	25.0%	0	0.0%
Sockeye salmon—early run	3	0	0.0%	0	0.0%	2	66.7%	0	0.0%	0	0.0%
Sockeye salmon—late run	1	0	0.0%	1	100.0%	1	100.0%	0	0.0%	0	0.0%
Other salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-82.—Continued.

Resource	Valid responses ^a	Increased effort to harvest		Got a job		Ate elsewhere		Got public assistance		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	3	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Other Salmon

In 2016 in Chignik Lagoon, six households used other salmon and the majority (68%) of responding households did not use chum, pink, or coho salmon (Table 3-78; Figure 3-94). Four of these households reported using the same amount of other salmon as in recent years and two households used fewer other salmon. Reasons given for less use included lack of equipment and working/no time (Table 3-79).

More sampled households that used other salmon determined that they had enough compared to households that thought that they needed more (Figure 3-95). Five households provided an assessment about having enough other salmon to meet household needs and only one household (20%) did not have enough, but the impact of not getting enough was minor and the household provided no response about doing anything differently as a result (Table 3-81; Table 3-82).

Chignik Lake

2014

Sockeye Salmon

Of 19 sampled households in Chignik Lake in 2014, 18 (95%) used sockeye salmon; six (32%) of those households used fewer fish, 10 (53%) used the same amount, and two (11%) used more compared to the previous five or so years (Table 3-83; Figure 3-96). One-half of the households that used fewer sockeye salmon cited resource availability (three responses) as a reason (Table 3-84). The remaining cited reasons were working/no time (two responses), family or personal reasons (one response), lack of effort (one response), and unsuccessful effort (one response). Both households that used more sockeye salmon offered explanations for why: needed more than in previous years (one response), put in more effort into harvesting sockeye salmon (one response), and substituting for other unavailable resources (one response) (Table 3-85).

Sampled households were evenly split when assessing whether more sockeye salmon were needed (Figure 3-97). In Chignik Lake, nine (50%) responding households said that they did not get enough sockeye salmon to meet their needs; one respondent (11%) said the impact of not getting enough was major, four (44%) said it was minor, three (33%) said the effect was not noticeable, and one household did not provide a response to this assessment question (Table 3-86). These households were asked to explain what they did differently as a result of not getting enough sockeye salmon in 2014, but only two provided responses. Both respondents indicated that they used more commercial foods, and one household replaced sockeye salmon with other subsistence foods (Table 3-87).

Chinook Salmon

In 2014, out of 19 sampled households, 12 (63%) in Chignik Lake used Chinook salmon, of which seven (37%) said they used fewer salmon compared to recent past years, four (21%) used the same amount, and one (5%) used more (Table 3-83; Figure 3-96). Primarily, Chinook salmon were less available (four responses) according to the households that used less of this species; added reasons for using fewer fish were family/personal circumstances (two responses), unsuccessful effort (one response), and regulations (one response) (Table 3-84). One household that used more Chinook salmon in 2014 said it had obtained equipment/gear to enable fishing (Table 3-85).

A slightly larger proportion (37%) of sampled households had enough Chinook salmon than the proportion (26%) that needed more (Figure 3-97). Five responding households said that they did not get enough, and, of those, one household said the impact was major, three said the impact was minor, and one household said it was unnoticeable (Table 3-86). Two households replaced Chinook salmon with other subsistence foods, but no other households described what was done in response to needing more Chinook salmon (Table 3-87).

Other Salmon

When asked to assess 2014 uses of other salmon (chum, coho, and pink combined), eight out of 19 (42%) sampled households used other salmon and most (six) used the same amount and the other two households (11%) used a smaller amount of other salmon (Table 3-83; Figure 3-96). The two households that used fewer other salmon provided three reasons why: less sharing, needed less, and resources were less available (Table 3-84). Approximately one-third (32%) of sampled households had enough other salmon (Figure 3-97). Out of 19 sampled households, seven (37%) used other salmon and only one household said they did not get enough to meet the household's needs, which had a minor effect on the household (Table 3-86). This household needed to use more commercial foods, and also replaced other salmon with other subsistence foods (Table 3-87).

Table 3-83.—Changes in household uses of salmon compared to recent years, Chignik Lake, 2014.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More			
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	19	19	18	94.7%	10	52.6%	14	73.7%	3	15.8%		
Chinook salmon	19	19	12	63.2%	7	36.8%	4	21.1%	1	5.3%	7	36.8%
Sockeye salmon	19	19	18	94.7%	6	31.6%	10	52.6%	2	10.5%	1	5.3%
Other salmon	19	19	8	42.1%	2	10.5%	6	31.6%	0	0.0%	11	57.9%

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

a. Valid responses do not include households that did not provide any response.

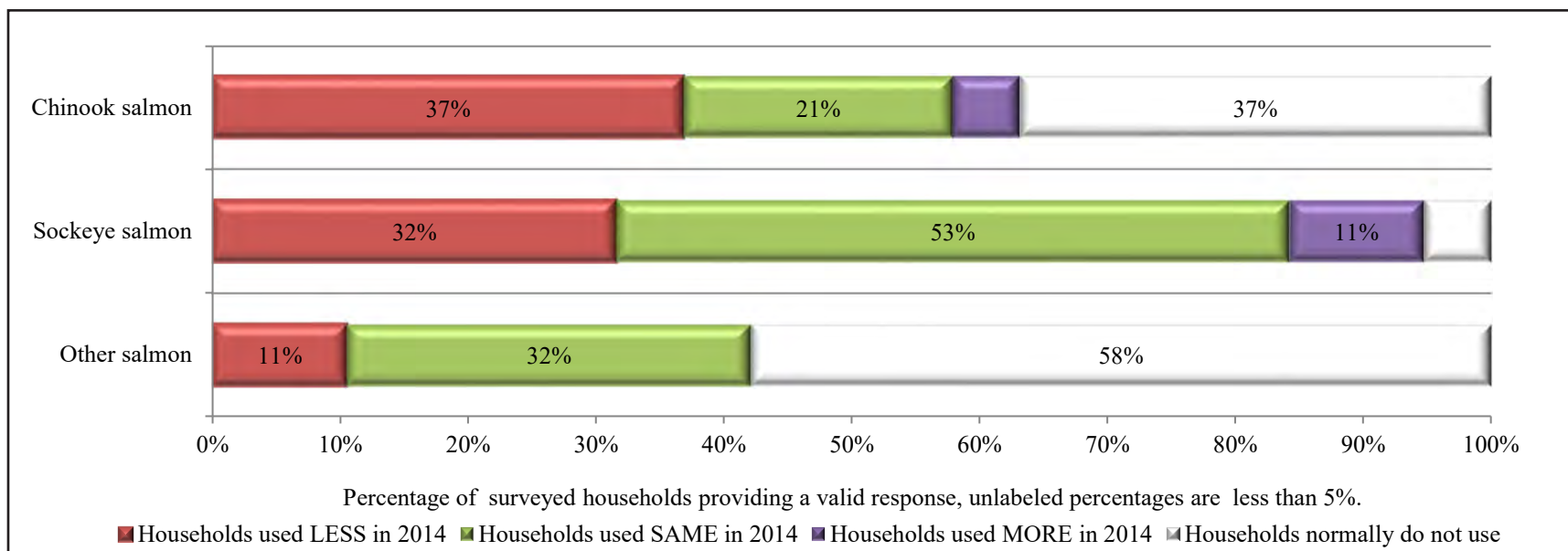


Figure 3-96.—Changes in household uses of salmon compared to recent years, Chignik Lake, 2014.

Table 3-84.—Reasons for less household uses of salmon compared to recent years, Chignik Lake, 2014.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/ personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	19	10	2	20.0%	0	0.0%	7	70.0%	0	0.0%	0	0.0%	1	10.0%	1	10.0%	2	20.0%
Chinook salmon	19	7	2	28.6%	0	0.0%	4	57.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	14.3%
Sockeye salmon	19	6	1	16.7%	0	0.0%	3	50.0%	0	0.0%	0	0.0%	0	0.0%	1	16.7%	1	16.7%
Other salmon	19	2	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%

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Table 3-84.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/ environment		Working/ no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	19	10	0	0.0%	2	20.0%	1	10.0%	0	0.0%	0	0.0%	1	10.0%	0	0.0%	0	0.0%
Chinook salmon	19	7	0	0.0%	0	0.0%	1	14.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	19	6	0	0.0%	2	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	19	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

Table 3-85.—Reasons for more household uses of salmon compared to recent years, Chignik Lake, 2014.

Resource	Valid responses ^a	Households reporting reasons for more use	Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	19	3	0	0.0%	0	0.0%	0	0.0%	1	33.3%	0	0.0%	1	33.3%	0	0.0%
Chinook salmon	19	1	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	19	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%
Other salmon	19	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-85.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	19	3	0	0.0%	0	0.0%	0	0.0%	1	33.3%	1	33.3%	0	0.0%
Chinook salmon	19	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	19	2	0	0.0%	0	0.0%	0	0.0%	1	50.0%	1	50.0%	0	0.0%
Other salmon	19	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

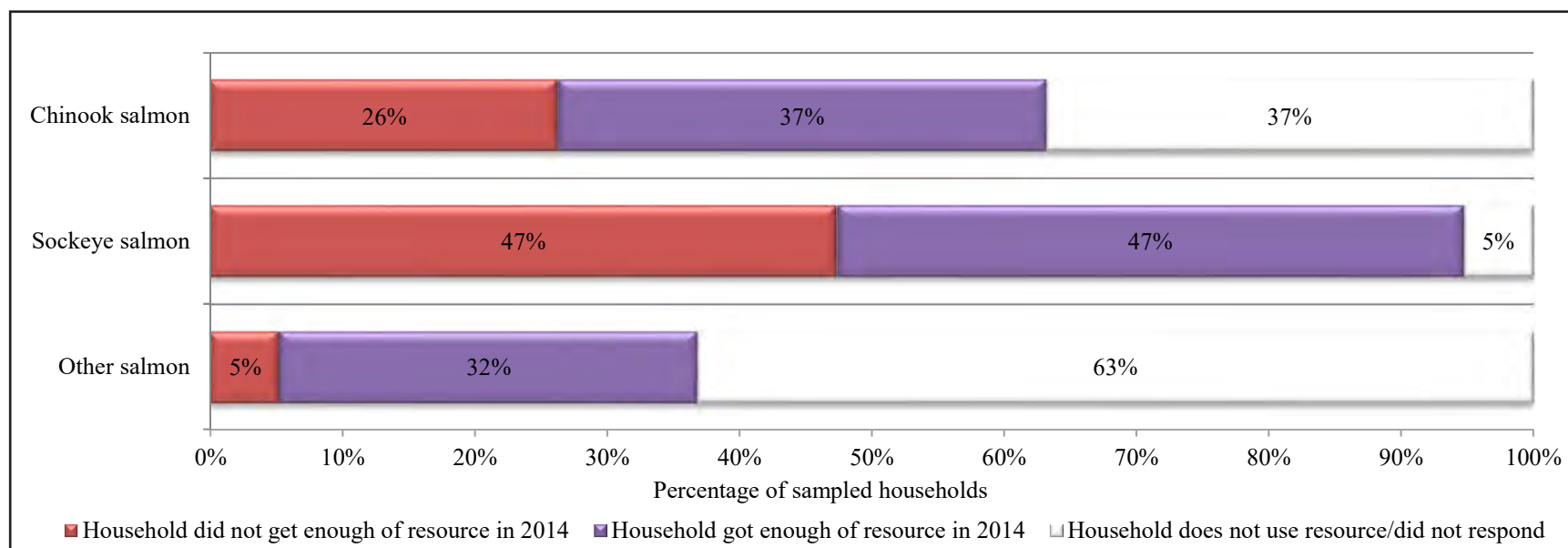


Figure 3-97.—Percentage of sampled households reporting whether they had enough resources, Chignik Lake, 2014.

Table 3-86.—Reported impact to households reporting that they did not get enough of a type of resources, Chignik Lake, 2014.

Resource	Sample households	Households not getting enough _____ .				Impact to those not getting enough _____ .									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	19	12	63.2%	5	41.7%	0	0.0%	1	20.0%	3	60.0%	1	20.0%	0	0.0%
Sockeye salmon	19	18	94.7%	9	50.0%	1	11.1%	3	33.3%	4	44.4%	1	11.1%	0	0.0%
Other salmon	19	7	36.8%	1	14.3%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%

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

a. Valid households do not include households failing to respond to the question and those households that never used the resource.

Table 3-87.—Things households reported doing differently as the result of not getting enough of a resource, Chignik Lake, 2014.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without		Increased effort to harvest	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	2	0	0.0%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	2	0	0.0%	2	100.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	1	0	0.0%	1	100.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-87.—Continued.

Resource	Valid responses ^a	Got a job		Ate elsewhere		Got public assistance		Conserved resource		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid households do not include households failing to respond to the question and those households that never used the resource.

Sockeye Salmon

Out of 26 responding households, 24 (92%) used sockeye salmon from the first or early run, of which 11 (42%) used fewer fish, six (23%) used the same amount, and seven (27%) used more in 2015 (Table 3-88; Figure 3-98). Out of 24 responding households, 22 (92%) used late-run sockeye salmon, of which nine (38%) decreased use, eight (33%) used the same amount, and five (21%) used more. Households that used a smaller amount of sockeye salmon from the early run or the late run cited a variety of reasons for why that was the case, but overlapping reasons for both resources included family/personal circumstances (four responses for early-run and three responses for late-run sockeye), resources less available (three responses for early run and two responses for later run), less sharing (two responses for early run and one for later run), lack of equipment (one response for early run and two for later run), and needed less (one response each). Additional reasons cited for why fewer early-run sockeye salmon were used included lack of effort, unsuccessful, and resource small or diseased (one response each). Other reasons provided for why there was less use of late-run salmon were weather/climate and working/no time (one response each) (Table 3-89). For both early-run and late-run sockeye salmon, the predominant reason for increased use was increased resource availability (four responses for each resource) and the need for more (one response for each resource) was also cited. Other reasons provided for why there was an increase in use of early-run sockeye salmon included more harvest effort (two responses) and had more time to get the resource (one response) (Table 3-90).

Households were also asked to evaluate if they obtained enough sockeye salmon to meet their needs from the early run and late run separately. The majority (54%) of sampled households had enough early-run fish, and a slightly smaller proportion (46%) had enough late-run sockeye salmon (Figure 3-99). Out of 22 responding households, seven (32%) said they did not get enough to meet their needs; three (43%) said the impact of not getting enough was major, three (43%) indicated the effect was minor, and one (14%) said it was not noticeable (Table 3-91). Out of 22 responding households, nine (41%) said they did not get enough late-run sockeye salmon to meet their needs, and two households said the impact was major, six (67%) said the impact was minor, and one said needing more of this resource was not noticeable. Most households (six) that did not have enough early-run sockeye salmon explained what they did as a result, which included used more commercial foods (three responses), replaced with other subsistence foods (two responses), and bought or bartered (one response) (Table 3-92). Only three of the households that did not get enough late-run sockeye salmon said what they did: used more commercial foods (two responses) and asked others for help (one response).

Chinook Salmon

In 2015, out of 26 responding Chignik Lake households, 11 (42%) said they used Chinook salmon, of which more than one-half (seven, or 27% of responding households) used fewer, two (8%) used the same amount, and two (8%) used more compared to recent previous years (Table 3-88; Figure 3-98). Reasons provided for why their use was reduced included: resource less available (three responses), less sharing (two responses), family or personal reasons (one response), lack of equipment (one response), unsuccessful (one response), and working or no time (one response) (Table 3-89). The two households that used more Chinook salmon in 2015 indicated receiving more fish and needing more as a reason for why (Table 3-90). While the majority of sampled households did not use Chinook salmon, there were fewer sampled households (11%) that did not have enough, either by harvesting or receiving fish, compared to the proportion that had enough (21%) (Figure 3-99). Three responding households (33%) did not get enough Chinook salmon to meet their needs; one household said the impact of not getting enough was major, one assessed that the impact was minor, and one said it was not noticeable (Table 3-91). Only one household provided a response as to what the household did differently as a result of not getting enough Chinook salmon, which was replacing salmon with other subsistence foods (Table 3-92).

Table 3-88.—Changes in household uses of salmon compared to recent years, Chignik Lake, 2015.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More			
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	28	27	25	92.6%	18	66.7%	12	44.4%	10	37.0%		
Chinook salmon	28	26	11	42.3%	7	26.9%	2	7.7%	2	7.7%	15	57.7%
Sockeye salmon—early run	28	26	24	92.3%	11	42.3%	6	23.1%	7	26.9%	2	7.7%
Sockeye salmon—late run	28	24	22	91.7%	9	37.5%	8	33.3%	5	20.8%	2	8.3%
Other salmon	28	27	5	18.5%	3	11.1%	2	7.4%	0	0.0%	22	81.5%

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

a. Valid responses do not include households that did not provide any response.

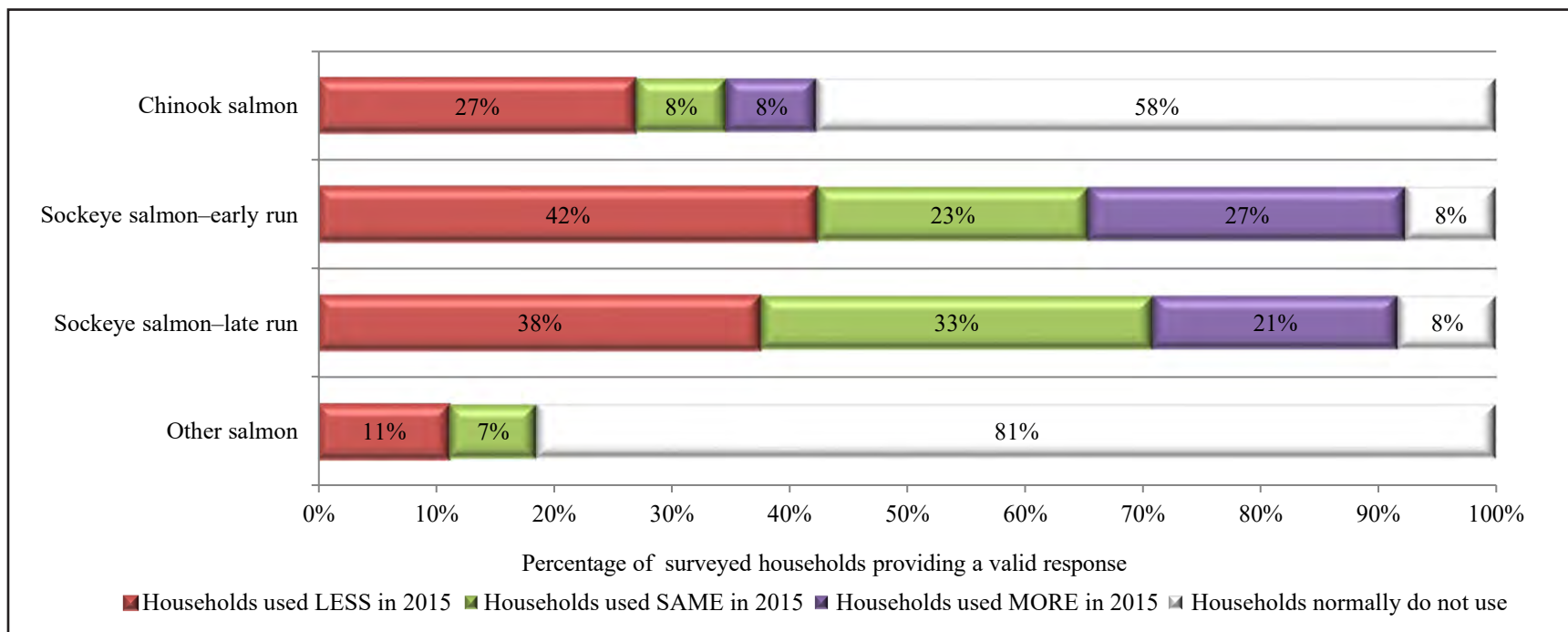


Figure 3-98.—Changes in household uses of salmon compared to recent years, Chignik Lake, 2015.

Table 3-89.—Reasons for less household uses of salmon compared to recent years, Chignik Lake, 2015.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	27	17	7	41.2%	0	0.0%	4	23.5%	0	0.0%	4	23.5%	4	23.5%	1	5.9%	2	11.8%
Chinook salmon	26	6	1	16.7%	0	0.0%	3	50.0%	0	0.0%	1	16.7%	2	33.3%	0	0.0%	1	16.7%
Sockeye salmon—early run	26	11	4	36.4%	0	0.0%	2	18.2%	0	0.0%	1	9.1%	2	18.2%	1	9.1%	1	9.1%
Sockeye salmon—late run	24	8	3	37.5%	0	0.0%	1	12.5%	0	0.0%	2	25.0%	1	12.5%	0	0.0%	0	0.0%
Other salmon	27	2	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%

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Table 3-89.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/environment		Working/no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	27	17	2	11.8%	3	17.6%	0	0.0%	1	5.9%	0	0.0%	1	5.9%	1	5.9%	0	0.0%
Chinook salmon	26	6	0	0.0%	1	16.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	26	11	0	0.0%	0	0.0%	0	0.0%	1	9.1%	0	0.0%	1	9.1%	0	0.0%	0	0.0%
Sockeye salmon—late run	24	8	2	25.0%	1	12.5%	0	0.0%	0	0.0%	0	0.0%	1	12.5%	0	0.0%	0	0.0%
Other salmon	27	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

Table 3-90.—Reasons for more household uses of salmon compared to recent years, Chignik Lake, 2015.

Resource	Valid responses ^a	Households reporting reasons for more use	Family/personal		Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	27	10	0	0.0%	0	0.0%	6	60.0%	0	0.0%	0	0.0%	1	10.0%	2	20.0%	1	10.0%
Chinook salmon	26	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	26	7	0	0.0%	0	0.0%	4	57.1%	0	0.0%	0	0.0%	0	0.0%	2	28.6%	0	0.0%
Sockeye salmon—late run	24	5	0	0.0%	0	0.0%	4	80.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%
Other salmon	27	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-90.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Had more time		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	27	10	0	0.0%	1	10.0%	0	0.0%	0	0.0%	3	30.0%	0	0.0%	0	0.0%
Chinook salmon	26	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	26	7	0	0.0%	1	14.3%	0	0.0%	0	0.0%	1	14.3%	0	0.0%	0	0.0%
Sockeye salmon—late run	24	5	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%	0	0.0%	0	0.0%
Other salmon	27	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

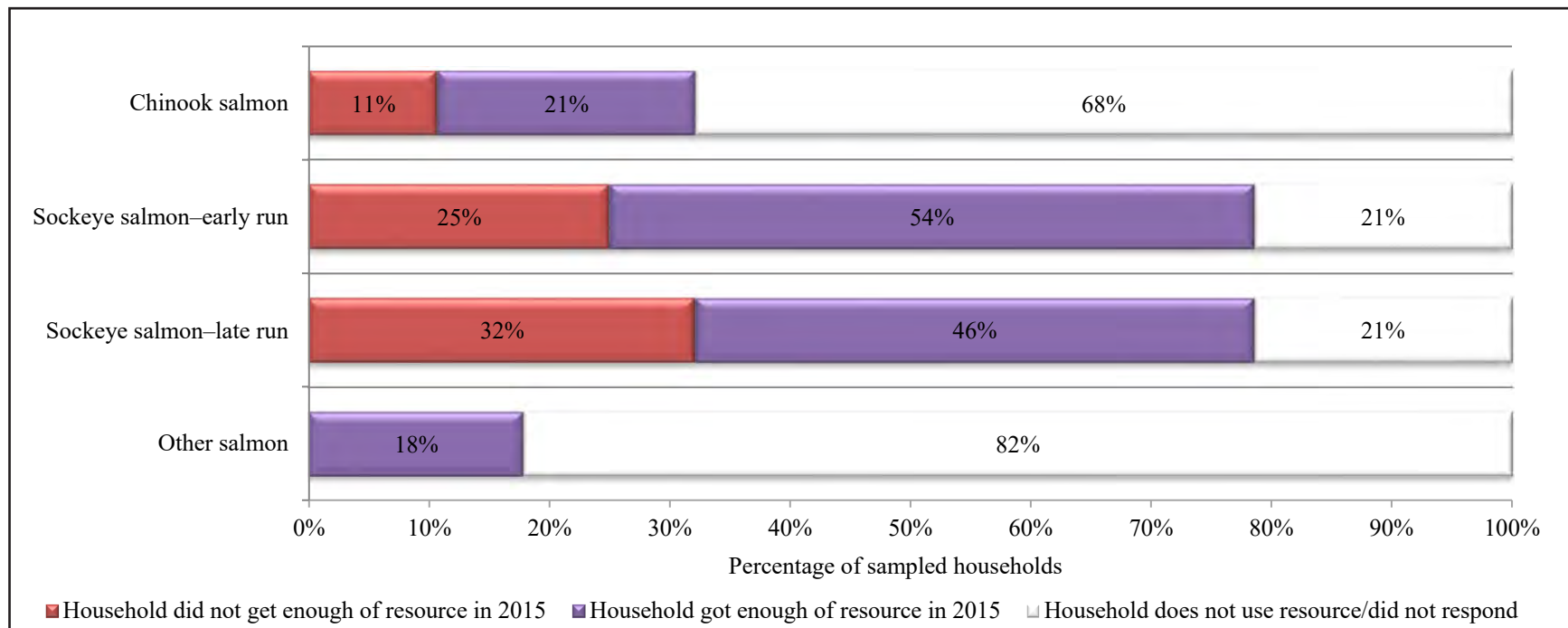


Figure 3-99.—Percentage of sampled households reporting whether they had enough resources, Chignik Lake, 2015.

Table 3-91.—Reported impact to households reporting that they did not get enough of a type of resources, Chignik Lake, 2015.

Resource	Sample households	Households not getting enough				Impact to those not getting enough									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	28	9	32.1%	3	33.3%	0	0.0%	1	33.3%	1	33.3%	1	33.3%	0	0.0%
Sockeye salmon-early run	28	22	78.6%	7	31.8%	0	0.0%	1	14.3%	3	42.9%	3	42.9%	0	0.0%
Sockeye salmon-late run	28	22	78.6%	9	40.9%	0	0.0%	1	11.1%	6	66.7%	2	22.2%	0	0.0%
Other salmon	28	5	17.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source: ADF&G Division of Subsistence household surveys, 2016.

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-92.—Things households reported doing differently as the result of not getting enough of a resource, Chignik Lake, 2015.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	6	1	16.7%	3	50.0%	2	33.3%	0	0.0%	0	0.0%
Sockeye salmon—late run	3	0	0.0%	2	66.7%	0	0.0%	1	33.3%	0	0.0%
Other salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-92.—Continued.

Resource	Valid responses ^a	Increased effort to harvest		Got a job		Ate elsewhere		Got public assistance		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	6	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Other Salmon

Five (19%) out of 27 responding households used other salmon: three (11%) used fewer chum, pink, and coho salmon, two (7%) used the same amount, and none used more of the other salmon species compared to the previous five years (Table 3-88; Figure 3-98). Two households provided reasons for using a smaller amount of other salmon and one response was provided for each of the following reasons: resources less available, less sharing, and competition (Table 3-89). There were no households that reported not getting enough other salmon to meet their needs in 2015 (Figure 3-99; Table 3-92).

2016

Sockeye Salmon

Assessments of use in 2016 compared to the previous five years for early-run sockeye salmon were opposite the assessments for late-run sockeye salmon (Figure 3-100). Responses indicated 13 households (48% of responding households) used fewer early-run sockeye salmon and eight households (30%) used the same amount, but seven households (26%) used fewer late-run sockeye salmon, and 12 households (44%) used the same amount (Table 3-93). Two reasons were both cited most frequently for less use of early-run and late-run sockeye salmon: resources less available and working/no time to harvest (Table 3-94). Those top two reasons were cited by 33%–42% of households that used less of these resources and also provided a reason why. Few Chignik Lake households indicated increased use of any salmon resource, but two households used more late-run sockeye salmon, citing that more fish were needed and this resource was a substitute for unavailable resources (Table 3-95).

Overall, more than one-third of sampled households did not have enough of both early-run and late-run sockeye salmon (Figure 3-101). Of the households that used sockeye salmon from the early run, 12 households (57%) out of 21 did not get enough to meet their needs (Table 3-96). Four households said the impact of not getting enough early-run sockeye salmon was major, five households said the impact was minor, two households thought it was not noticeable, and one household did not give a response. As a result of not getting enough early-run sockeye salmon, these households used more commercial foods (four responses), asked others for help (two responses), increased effort (two responses), made do without (two responses), and used other subsistence foods (one response) (Table 3-97). Out of 21 households that used late-run sockeye salmon, 10 (48%) did not get enough to meet their needs (Table 3-96). Three households said that the impact of not getting enough of the resource was major, six said it was minor, and one gave no response. Some of the households described what they did differently as a result of not getting enough late-run sockeye salmon, which included: they made do without (three responses), used more commercial foods (two responses), asked others for help (two responses), and another reason. (Table 3-97).

Chinook Salmon

For the six households that used Chinook salmon in 2016, the assessments were evenly split: three households used fewer fish and three households used the same amount of this resource, which represents 11% of the responding households for each assessment (Table 3-93). All three households that used fewer Chinook salmon gave a reason for why: family/personal reasons, resource less available, lack of effort, and another reason (one response each) (Table 3-94).

Three of the six households that used Chinook salmon did not get enough; two households said the impact of not getting enough of this resource was major, and one household said the impact was minor (Table 3-96). Responses about how they handled not having enough Chinook salmon were split evenly among having used more commercial foods, used other subsistence foods, and made do without (one response each) (Table 3-97).

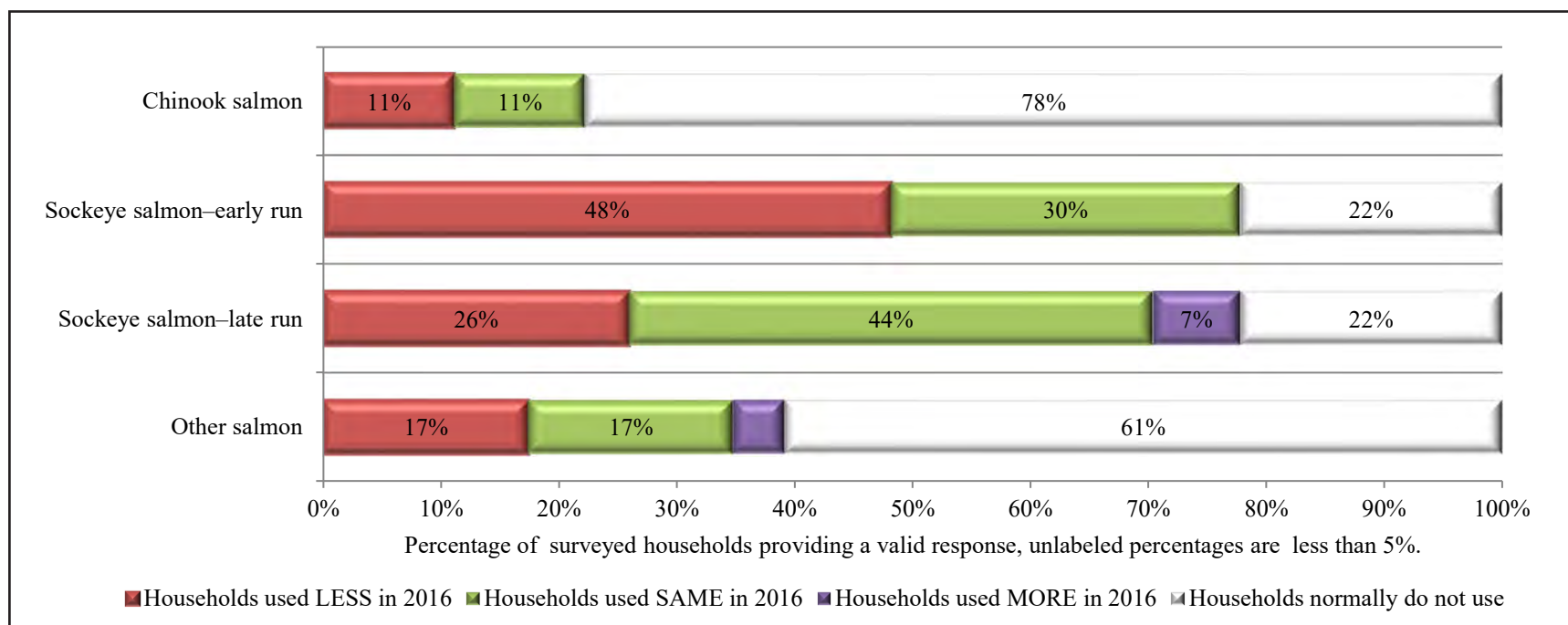


Figure 3-100.—Changes in household uses of salmon compared to recent years, Chignik Lake, 2016.

Table 3-93.—Changes in household uses of salmon compared to recent years, Chignik Lake, 2016.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More			
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	28	28	24	85.7%	18	64.3%	16	57.1%	3	10.7%		
Chinook salmon	28	27	6	22.2%	3	11.1%	3	11.1%	0	0.0%	21	77.8%
Sockeye salmon—early run	28	27	21	77.8%	13	48.1%	8	29.6%	0	0.0%	6	22.2%
Sockeye salmon—late run	28	27	21	77.8%	7	25.9%	12	44.4%	2	7.4%	6	22.2%
Other salmon	28	23	9	39.1%	4	17.4%	4	17.4%	1	4.3%	14	60.9%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

Table 3-94.—Reasons for less household uses of salmon compared to recent years, Chignik Lake, 2016.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/ personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	28	16	3	18.8%	0	0.0%	7	43.8%	0	0.0%	2	12.5%	0	0.0%	1	6.3%	0	0.0%
Chinook salmon	27	3	1	33.3%	0	0.0%	1	33.3%	0	0.0%	0	0.0%	0	0.0%	1	33.3%	0	0.0%
Sockeye salmon—early run	27	12	2	16.7%	0	0.0%	5	41.7%	0	0.0%	1	8.3%	0	0.0%	1	8.3%	0	0.0%
Sockeye salmon—late run	27	6	1	16.7%	0	0.0%	2	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	23	4	2	50.0%	0	0.0%	1	25.0%	0	0.0%	1	25.0%	0	0.0%	1	25.0%	0	0.0%

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Table 3-94.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/ environment		Working/ no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	28	16	1	6.3%	6	38%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	18.8%
Chinook salmon	27	3	0	0.0%	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%
Sockeye salmon—early run	27	12	1	8.3%	4	33%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	16.7%
Sockeye salmon—late run	27	6	1	16.7%	2	33%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	33.3%
Other salmon	23	4	0	0.0%	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

Table 3-95.—Reasons for more household uses of salmon compared to recent years, Chignik Lake, 2016.

Resource	Valid responses ^a	Households reporting reasons for more use	Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	28	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Chinook salmon	27	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	27	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	27	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	23	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-95.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Had more time		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	28	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	66.7%	1	33.3%	0	0.0%
Chinook salmon	27	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	27	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	27	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	1	50.0%	0	0.0%
Other salmon	23	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

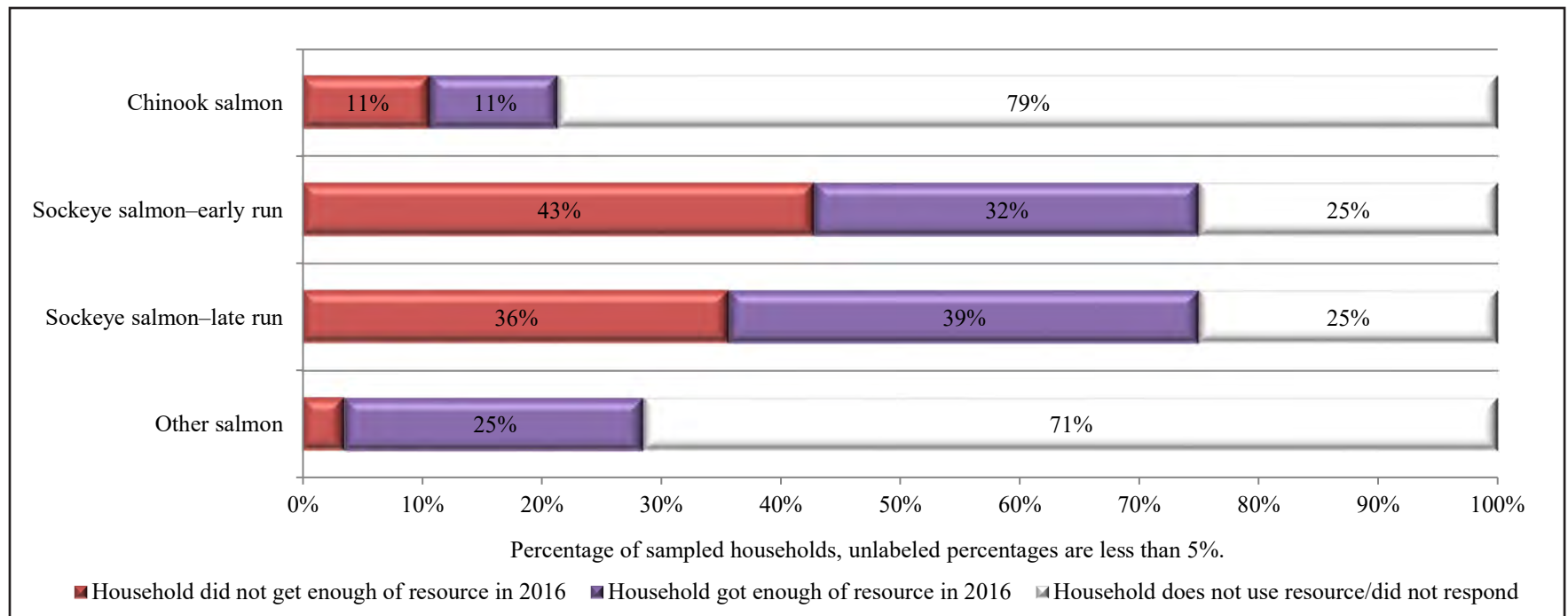


Figure 3-101.—Percentage of sampled households reporting whether they had enough resources, Chignik Lake, 2016.

Table 3-96.—Reported impact to households reporting that they did not get enough of a type of resources, Chignik Lake, 2016.

Resource	Sample households	Households not getting enough				Impact to those not getting enough									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	28	6	21.4%	3	50.0%	0	0.0%	0	0.0%	1	33.3%	2	66.7%	0	0.0%
Sockeye salmon-early run	28	21	75.0%	12	57.1%	1	8.3%	2	16.7%	5	41.7%	4	33.3%	0	0.0%
Sockeye salmon-late run	28	21	75.0%	10	47.6%	1	10.0%	0	0.0%	6	60.0%	3	30.0%	0	0.0%
Other salmon	28	8	28.6%	1	12.5%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-97.—Things households reported doing differently as the result of not getting enough of a resource, Chignik Lake, 2016.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	3	0	0.0%	1	33.3%	1	33.3%	0	0.0%	1	33.3%
Sockeye salmon—early run	11	0	0.0%	4	36.4%	1	9.1%	2	18.2%	2	18.2%
Sockeye salmon—late run	7	0	0.0%	2	28.6%	0	0.0%	2	28.6%	3	42.9%
Other salmon	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-97.—Continued.

Resource	Valid responses ^a	Increased effort to harvest		Got a job		Ate elsewhere		Got public assistance		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	11	2	18.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	7	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	14.3%
Other salmon	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Other Salmon

Out of 23 households that answered questions about using other salmon, nine households (39%) used other salmon (Table 3-93). Overall, four households used fewer fish, four used the same amount, and one household used more other salmon compared to the recent previous five years. Reasons for less use of other salmon included: family/personal reasons (two responses), resources less available (one response), lack of equipment (one response), and lack of effort (one response) (Table 3-94). Few Chignik Lake households indicated increased use of any salmon resource, but one household used more other salmon because more fish were needed (Table 3-93; Table 3-95).

Only one responding household did not get enough other salmon, which had a minor impact on the household and this household used more commercial foods to make up for the lack of an adequate supply of salmon harvested or received (Table 3-96; Table 3-97).

Perryville

2014

Sockeye Salmon

Of 34 sampled households, 100% used sockeye salmon, of which 16 (47%) used fewer fish, 11 (32%) used the same amount, and seven (21%) used more compared to the previous five years (Table 3-98; Figure 3-102). A variety of reasons for using fewer sockeye salmon were provided by all the households that assessed less use in 2014, but the majority (69%) indicated that the resource was less available (11 responses) (Table 3-99). Other reasons cited for using fewer sockeye salmon included: unsuccessful effort (seven responses), working or no time (three responses), family or personal reasons (two responses), less sharing (two responses), needed less (two responses), and lack of effort (one response). Seven households said they used more sockeye salmon in 2014 than in recent years, and reasons they gave for increased use included: increased availability (four responses), more success (three responses), weather (one response), and received more (one response) (Table 3-100).

In Perryville, 11 (32%) of the sampled households said they did not get enough sockeye salmon to meet their needs in 2014 and one (9%) said the impact of not getting enough was major, eight (73%) said it was minor, one (9%) said effect was not noticeable, and one household did not provide a response (Figure 3-103; Table 3-101). These households were asked to explain what they did differently as a result of not getting enough sockeye in 2014, and four households provided responses: three said that they used more commercial foods, and the other household asked others for help (Table 3-102).

Chinook Salmon

In 2014, out of 33 responding Perryville households, 24 (73%) used Chinook salmon, of which, five (15% of responding households) decreased use compared to recent past years, 11 (33%) used the same amount, and eight (24%) used more (Table 3-98; Figure 3-102). A variety of reasons were provided as to why use of Chinook salmon for these five households was less, including: resource less available (two responses), used other resources (one response), less sharing (one response), lack of effort (one response), working/no time (one response), and needed less (one response) (Table 3-99). All eight households that used more Chinook salmon in 2014 did provide a reason why: increased resource availability (six responses), received more (two responses), and more success (one response) (Table 3-100). The majority of sampled households assessed that they had enough Chinook salmon in Perryville in 2014 (Figure 3-103). Out of 25 households that provided a response, three (12%) did not get enough Chinook salmon and all said the impact to the household was minor (Table 3-101). One household expanded on this assessment question and indicated more commercial foods were used in 2014 (Table 3-102).

Table 3-98.—Changes in household uses of salmon compared to recent years, Perryville, 2014.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More			
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	34	34	34	100.0%	22	64.7%	22	64.7%	13	38.2%		
Chinook salmon	34	33	24	72.7%	5	15.2%	11	33.3%	8	24.2%	9	27.3%
Sockeye salmon	34	34	34	100.0%	16	47.1%	11	32.4%	7	20.6%	0	0.0%
Other salmon	34	34	33	97.1%	16	47.1%	11	32.4%	6	17.6%	1	2.9%

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

a. Valid responses do not include households that did not provide any response.

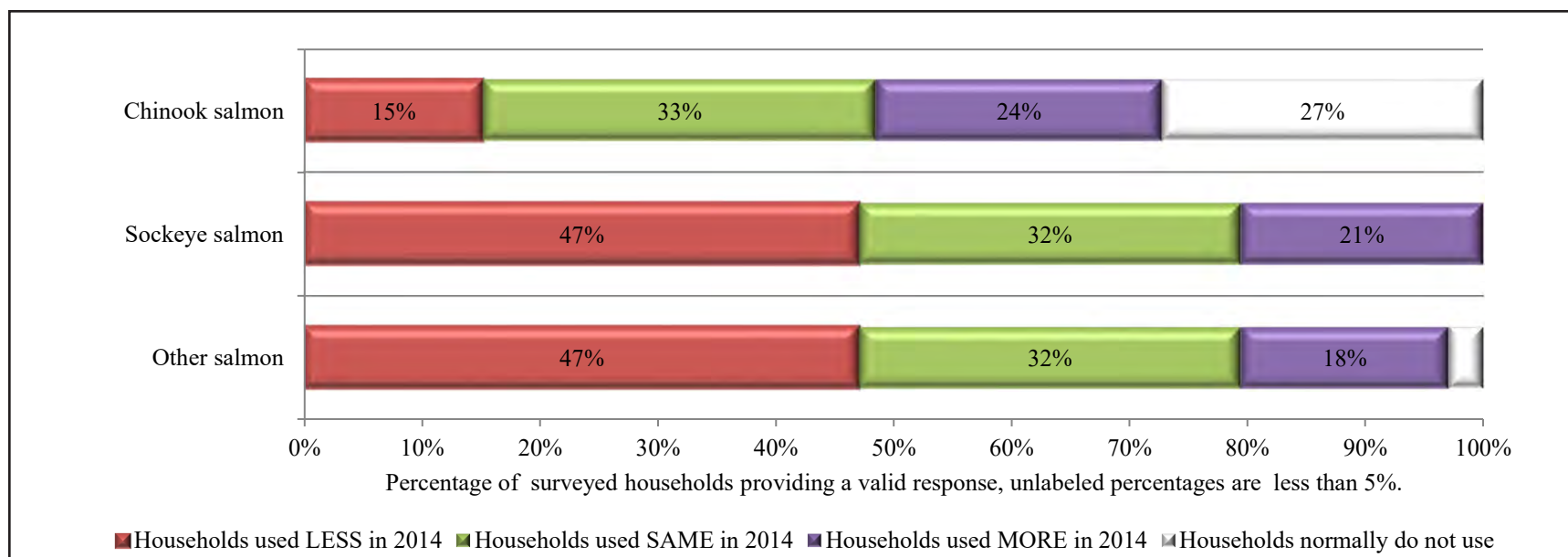


Figure 3-102.—Changes in household uses of salmon compared to recent years, Perryville, 2014.

Table 3-99.—Reasons for less household uses of salmon compared to recent years, Perryville, 2014.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/ personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	34	22	3	13.6%	1	4.5%	16	72.7%	1	4.5%	2	9.1%	5	22.7%	2	9.1%	8	36.4%
Chinook salmon	33	5	0	0.0%	1	20.0%	2	40.0%	0	0.0%	0	0.0%	1	20.0%	1	20.0%	0	0.0%
Sockeye salmon	34	16	2	12.5%	0	0.0%	11	68.8%	0	0.0%	0	0.0%	2	12.5%	1	6.3%	7	43.8%
Other salmon	34	16	1	6.3%	0	0.0%	9	56.3%	1	6.3%	2	12.5%	4	25.0%	1	6.3%	1	6.3%

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Table 3-99.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/ environment		Working/ no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	34	22	1	4.5%	3	13.6%	0	0.0%	0	0.0%	0	0.0%	3	13.6%	0	0.0%	0	0.0%
Chinook salmon	33	5	0	0.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%	0	0.0%	0	0.0%
Sockeye salmon	34	16	0	0.0%	3	18.8%	0	0.0%	0	0.0%	0	0.0%	2	12.5%	0	0.0%	0	0.0%
Other salmon	34	16	1	6.3%	2	12.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

Table 3-100.—Reasons for more household uses of salmon compared to recent years, Perryville, 2014.

Resource	Valid responses ^a	Households reporting reasons for more use	Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	34	13	0	0.0%	11	84.6%	0	0.0%	0	0.0%	2	15.4%	1	7.7%	5	38.5%
Chinook salmon	33	8	0	0.0%	6	75.0%	0	0.0%	0	0.0%	2	25.0%	0	0.0%	1	12.5%
Sockeye salmon	34	7	0	0.0%	4	57.1%	0	0.0%	0	0.0%	1	14.3%	0	0.0%	3	42.9%
Other salmon	34	6	0	0.0%	4	66.7%	0	0.0%	0	0.0%	0	0.0%	1	16.7%	2	33.3%

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Table 3-100.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	34	13	2	15.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Chinook salmon	33	8	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	34	7	1	14.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	34	6	2	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

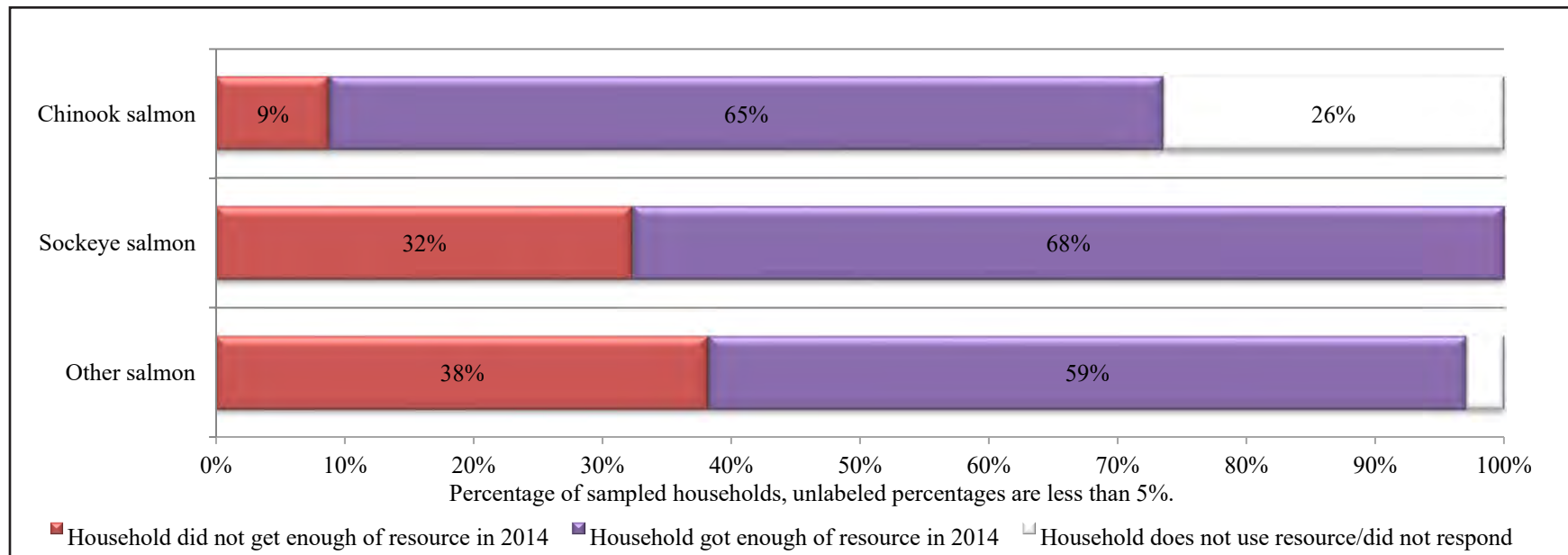


Figure 3-103.—Percentage of sampled households reporting whether they had enough resources, Perryville, 2014.

Table 3-101.—Reported impact to households reporting that they did not get enough of a type of resources, Perryville, 2014.

Resource	Sample households	Households not getting enough				Impact to those not getting enough									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	34	25	73.5%	3	12.0%	0	0.0%	0	0.0%	3	100.0%	0	0.0%	0	0.0%
Sockeye salmon	34	34	100.0%	11	32.4%	1	9.1%	1	9.1%	8	72.7%	1	9.1%	0	0.0%
Other salmon	34	33	97.1%	13	39.4%	1	7.7%	1	7.7%	9	69.2%	2	15.4%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-102.—Things households reported doing differently as the result of not getting enough of a resource, Perryville, 2014.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without		Increased effort to harvest	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	4	0	0.0%	3	75.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%
Other salmon	9	0	0.0%	7	77.8%	2	22.2%	0	0.0%	0	0.0%	0	0.0%

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Table 3-102.—Continued.

Resource	Valid responses ^a	Got a job		Ate elsewhere		Got public assistance		Conserved resource		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	4	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	9	0	0.0%	1	11.1%	1	11.1%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Other Salmon

When asked to compare 2014 uses of other salmon (chum, coho, and pink combined), 33 out of 34 sampled households (97%) used other salmon, of which 16 households (47%) said they used fewer of these salmon than in recent years, 11 (32%) used the same amount, and six (18%) used more (Table 3-98; Figure 3-102). Of the households that used fewer other salmon, reasons for less use included: resources less available (nine responses), less sharing (four responses), working or no time (two responses), lack of equipment (two responses), too far to travel (one response), family or personal reasons (one response), too far to travel (one response), lack of effort (one response), unsuccessful (one response), and weather or environment (one response) (Table 3-99). Six households reported using more other salmon, and, of these, four households said they harvested more because of increased resource availability; additional reasons included: more success (two responses), weather (two responses), and increased effort (one response) (Table 3-100). When asked if they got enough other salmon to meet their needs, 13 of 33 responding households (39%) said they did not get enough, and, of those households, two said the impact was major, nine said impact was minor, one said the impact was not noticeable, and one household did not provide a response (Table 3-101). When asked what they did differently as a result of not getting enough, seven of the nine households said they used more commercial foods, two said they replaced the fish with other subsistence foods, one obtained food from other sources, and one got public assistance (Table 3-102).

2015

Sockeye Salmon

For 2015, the survey asked Perryville households if they used a different amount of early-run sockeye salmon and if they used a different amount of late-run sockeye salmon. Of 33 sampled households in Perryville in 2015, most households (29, or 88%) used late-run sockeye salmon and nearly as many (23, or 70%) used early-run sockeye salmon (Table 3-103). Almost the same number of households assessed less use of sockeye salmon from each run: eight households (24%) used fewer salmon from the first run and nine households (27%) used fewer fish from the second run (Table 3-103; Figure 3-104). All eight households that used fewer early-run sockeye salmon cited at least one reason why: family/personal reasons (five responses), resource less available (two responses), lack of equipment (two responses) and, small/diseased resource (one response) (Table 3-104). Only six households provided reasons for less use of sockeye salmon from the late run: lack of equipment (two responses), needed less (two responses), lack of resource availability (one response), and working/no time (one response). The same number of households (6, or 18%) used more sockeye salmon from either run, but nine and 14 households (or 27% and 42%) used the same amount of early-run and late-run sockeye salmon, respectively, in 2015 in Perryville (Table 3-103). Reasons provided for the increased use of early-run sockeye salmon included: increased availability (two responses), increased effort (two responses), received more (one response), and other (one response) (Table 3-105). Cited reasons for using more late-run sockeye salmon included: received more (two responses), increased availability (two responses), more harvest success (two responses), used other resources (one response), family/personal circumstances (one response), and had more time (one response).

For both runs of sockeye salmon, the majority of sampled households had enough fish (Figure 3-105). Of the households that used sockeye from the early run, six (26%) said they did not get enough to meet their needs: four households thought the impact of not getting enough was minor, and two households said it was not noticeable (Table 3-106). Out of 26 households that provided an assessment about having enough sockeye from the late run, five (19%) said they did not get enough to meet their needs, and, of these households, three (60%) said the impact was minor and two (40%) said impact was not noticeable. Only two households provided a description of what they did in 2015 when they needed more early-run sockeye salmon, and both said they used more commercial foods (Table 3-107). For late-run sockeye salmon, two households said that they used more commercial foods (one response) and replaced this resource with other subsistence foods (one response).

Chinook Salmon

In 2015, responses showed 14 out of 33 (42%) sampled households in Perryville used Chinook salmon, of which most (10 households, or 30%) used fewer fish, one (3%) used the same amount, and three (9%) used more compared to recent previous years (Table 3-103; Figure 3-104). The reason provided by most responding households cited for why they used less was that they needed less of this resource (five responses), while other reasons included: unsuccessful (two responses), less sharing (one response), and lack of effort (one response) (Table 3-104). Only three households used more Chinook salmon in 2015, and one reason was cited by each household for this increase: increased availability, more success, and needed more (Table 3-105). Households were asked if they got enough, either by harvesting or receiving, Chinook salmon in 2015 to meet their needs, and three (21%) of 14 responding households did not get enough to meet their needs (Table 3-106). Two of these households said the impact of not getting enough was minor, the other household did not provide a response, and no households described what they did as a result of not having enough (Table 3-106; Table 3-107).

Other Salmon

Similarly to 2014, a very high proportion of households in Perryville used other salmon: 31 (97%) out of 32 responding households used other salmon. Assessments provided by these households indicated 12 households used fewer other salmon compared to recent years, 11 households used the same amount, and eight used more (Table 3-103; Figure 3-104). Reasons provided by households as to why their use was decreased included: needed less (four responses), resources less available (two responses), lack of equipment (two responses), working/no time (two responses), family or personal reasons (one response), lack of effort (one response), and unsuccessful (one response) (Table 3-104). All eight households that reported more use of other salmon in 2015 described why: increased availability (four responses), needed more (two responses), more success (two responses), and received more (one response) (Table 3-105). When asked if they got enough other salmon to meet their needs, four households said they did not; two of these households said the impact of not getting enough other salmon was minor, one said it was not noticeable, and one did not provide a response (Table 3-106). Two households described what was done in response to having not enough other salmon resources, which included: used other subsistence foods (two responses) and used more commercial foods (one response) (Table 3-107).

2016

Sockeye Salmon

Of 26 sampled households in Perryville, 23 answered questions about changes to salmon use for both early-run and late-run sockeye salmon (Table 3-108). There were 23 households (100%) that used sockeye salmon from the first run, and 18 households (78%) used sockeye salmon from the second run. Of the households that used early-run sockeye salmon, 12 households (52%) used fewer salmon than in the last five years, nine households (39%) used about the same amount, and two households (9%) used more early-run sockeye salmon in 2016 (Table 3-108; Figure 3-106). Out of the 23 respondents, five households (22%) used fewer late-run sockeye salmon, 11 households (48%) used the same amount, and two households (9%) used more. The two most frequently cited reasons provided for less use of early-run sockeye were working/no time (four respondents) and resource availability (three respondents) (Table 3-109). For less use of late-run sockeye, these same reasons were provided along with weather/environment conditions. Additional reasons for decreased use of early-run sockeye salmon were each cited by one respondent: weather/environment conditions, less sharing, lack of effort, and other. The two households that reported using more early-run sockeye salmon in 2016 provided these reasons for their increased use: increased effort (two responses) and needed more (one response) (Table 3-110). The two households that used more late-run sockeye salmon in 2016 indicated that more of the resource was needed (one response) and the household experienced more harvesting success (one response).

Table 3-103.—Changes in household uses of salmon compared to recent years, Perryville, 2015.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not using	
			Total households		Less		Same		More			
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	33	33	33	100.0%	24	72.7%	18	54.5%	15	45.5%		
Chinook salmon	33	33	14	42.4%	10	30.3%	1	3.0%	3	9.1%	19	57.6%
Sockeye salmon—early run	33	33	23	69.7%	8	24.2%	9	27.3%	6	18.2%	10	30.3%
Sockeye salmon—late run	33	33	29	87.9%	9	27.3%	14	42.4%	6	18.2%	4	12.1%
Other salmon	33	32	31	96.9%	12	37.5%	11	34.4%	8	25.0%	1	3.1%

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

a. Valid responses do not include households that did not provide any response.

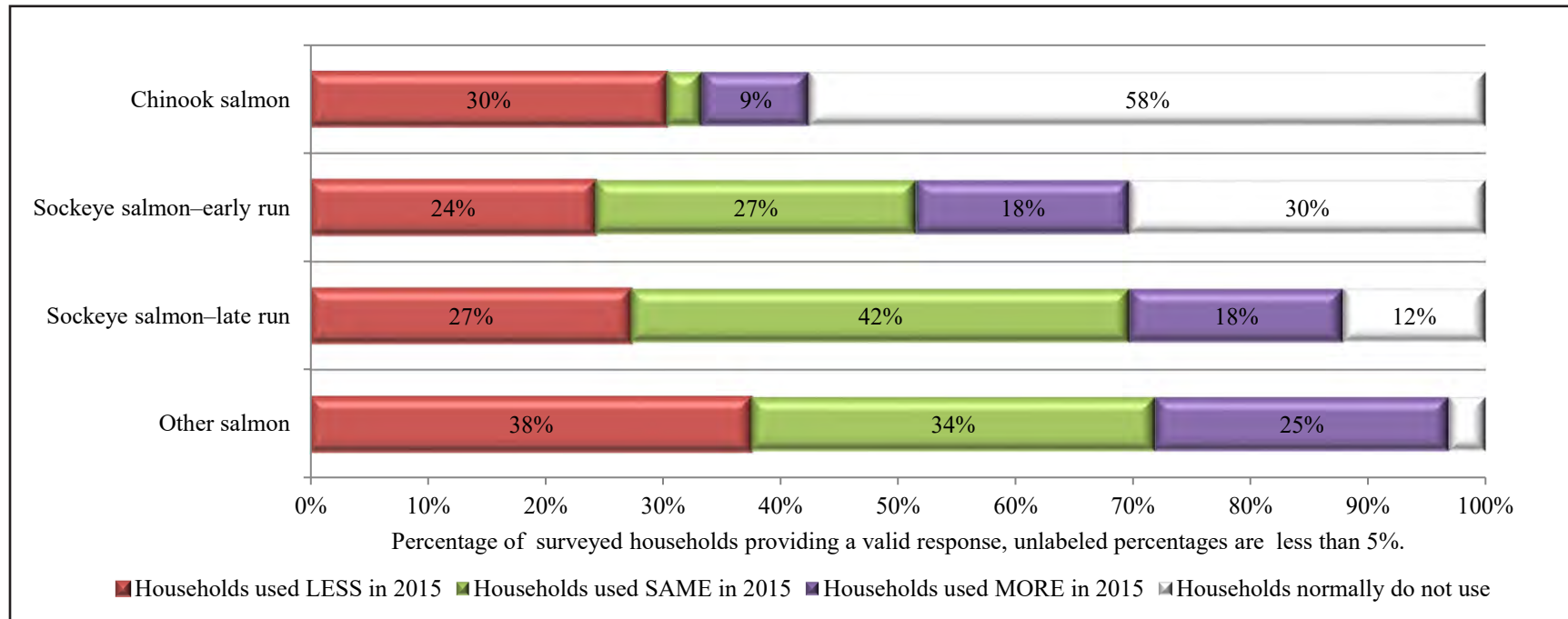


Figure 3-104.—Changes in household uses of salmon compared to recent years, Perryville, 2015.

Table 3-104.—Reasons for less household uses of salmon compared to recent years, Perryville, 2015.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/ personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	33	22	5	22.7%	0	0.0%	4	18.2%	0	0.0%	2	9.1%	1	4.5%	2	9.1%	3	13.6%
Chinook salmon	33	9	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	11.1%	1	11.1%	2	22.2%
Sockeye salmon—early run	33	8	5	62.5%	0	0.0%	2	25.0%	0	0.0%	2	25.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	33	6	0	0.0%	0	0.0%	1	16.7%	0	0.0%	2	33.3%	0	0.0%	0	0.0%	0	0.0%
Other salmon	32	12	1	8.3%	0	0.0%	2	16.7%	0	0.0%	2	16.7%	0	0.0%	1	8.3%	1	8.3%

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Table 3-104.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/ environment		Working/ no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	33	22	0	0.0%	4	18.2%	0	0.0%	1	4.5%	0	0.0%	9	40.9%	0	0.0%	0	0.0%
Chinook salmon	33	9	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	5	55.6%	0	0.0%	0	0.0%
Sockeye salmon—early run	33	8	0	0.0%	0	0.0%	0	0.0%	1	12.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	33	6	0	0.0%	1	16.7%	0	0.0%	0	0.0%	0	0.0%	2	33.3%	0	0.0%	0	0.0%
Other salmon	32	12	0	0.0%	2	16.7%	0	0.0%	0	0.0%	0	0.0%	4	33.3%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

Table 3-105.—Reasons for more household uses of salmon compared to recent years, Perryville, 2015.

Resource	Valid responses ^a	Households reporting reasons for more use	Family/personal		Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	33	15	1	6.7%	1	6.7%	7	46.7%	0	0.0%	0	0.0%	3	20.0%	2	13.3%	3	20.0%
Chinook salmon	33	3	0	0.0%	0	0.0%	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%
Sockeye salmon—early run	33	6	0	0.0%	0	0.0%	2	33.3%	0	0.0%	0	0.0%	1	16.7%	2	33.3%	0	0.0%
Sockeye salmon—late run	33	6	1	16.7%	1	16.7%	2	33.3%	0	0.0%	0	0.0%	2	33.3%	0	0.0%	2	33.3%
Other salmon	32	8	0	0.0%	0	0.0%	4	50.0%	0	0.0%	0	0.0%	1	12.5%	0	0.0%	2	25.0%

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Table 3-105.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Had more time		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	33	15	0	0.0%	1	6.7%	0	0.0%	0	0.0%	3	20.0%	0	0.0%	2	13.3%
Chinook salmon	33	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	33.3%	0	0.0%	0	0.0%
Sockeye salmon—early run	33	6	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	33.3%
Sockeye salmon—late run	33	6	0	0.0%	1	16.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	32	8	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	25.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households that did not provide any response.

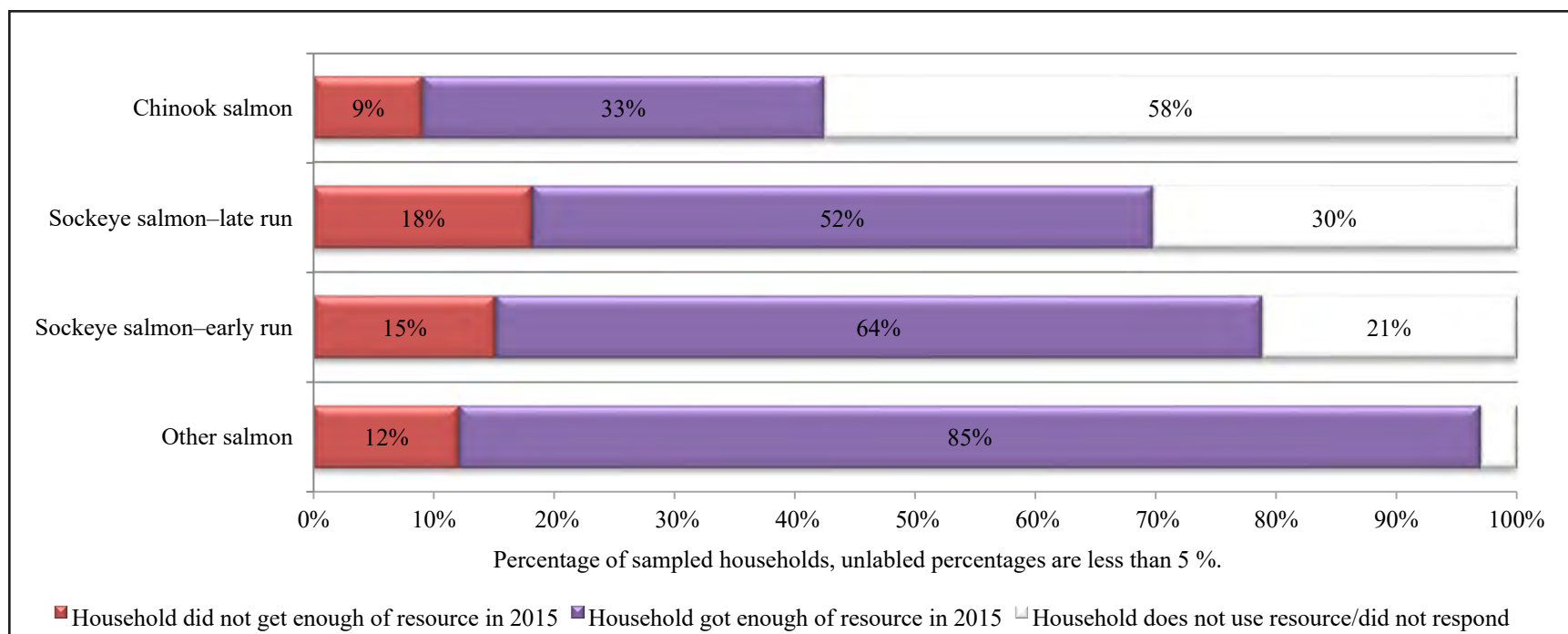


Figure 3-105.—Percentage of sampled households reporting whether they had enough resources, Perryville, 2015.

Table 3-106.—Reported impact to households reporting that they did not get enough of a type of resources, Perryville, 2015.

Resource	Sample households	Households not getting enough _____ .				Impact to those not getting enough _____ .									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	33	14	42.4%	3	21.4%	1	33.3%	0	0.0%	2	66.7%	0	0.0%	0	0.0%
Sockeye salmon-early run	33	23	69.7%	6	26.1%	0	0.0%	2	33.3%	4	66.7%	0	0.0%	0	0.0%
Sockeye salmon-late run	33	26	78.8%	5	19.2%	0	0.0%	2	40.0%	3	60.0%	0	0.0%	0	0.0%
Other salmon	33	32	97.0%	4	12.5%	1	25.0%	1	25.0%	2	50.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-107.—Things households reported doing differently as the result of not getting enough of a resource, Perryville, 2015.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	2	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	2	0	0.0%	1	50.0%	1	50.0%	0	0.0%	0	0.0%
Other salmon	2	0	0.0%	1	50.0%	2	100.0%	0	0.0%	0	0.0%

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Table 3-107.—Continued.

Resource	Valid responses ^a	Increased effort to harvest		Got a job		Ate elsewhere		Got public assistance		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

In Perryville in 2016, most sampled households had enough early-run and late-run sockeye salmon: 73% and 50%, respectively (Figure 3-107). Of the 23 households that used sockeye salmon from the early run, four (17%) did not get enough to meet household needs (Table 3-111). One household said the impact of not getting enough early-run sockeye salmon was major, two households said the impact was minor, and one gave no response. Three responding households cited using other subsistence foods (one response) and using more commercial foods (two responses) due to not having enough early-run sockeye salmon (Table 3-112). There were 17 households that responded to questions about having enough late-run sockeye salmon and four households did not get enough to meet their needs (Table 3-111). The assessments about the impact to households were evenly split among major, minor, and not noticeable, and one household did not provide that assessment. Only one household provided a description of what its members did differently as a result of not getting enough late-run sockeye salmon, which was increased harvest effort (Table 3-112).

Chinook Salmon

In 2016, out of 26 sampled households, 24 answered questions about changes to Chinook salmon use but only nine households used this resource (Table 3-108). Two households (8%) used fewer Chinook salmon, seven households (29%) used the same amount, and no households used more of this resource compared to recent years (Table 3-108; Figure 3-106). The two households that used fewer Chinook salmon said the reasons why were less sharing (one response) and lack of effort (one response) (Table 3-109).

Only one responding household did not get enough Chinook salmon, and the impact of not getting enough was minor and other subsistence foods were used to make up for the lack of Chinook salmon (Table 3-111; Table 3-112).

Other Salmon

Compared to the other three study communities, use of other salmon was highest in Perryville in all three study years. Out of 26 sampled households, 24 answered questions about using other salmon, and nearly all the responding households (22, or 92%) used other salmon (Table 3-108). Nearly one-half (46%) of responding households used fewer other salmon, and the most frequently cited reasons for less use were resource availability (five responses) and weather/environment conditions (three responses) (Table 3-109). No responding households indicated more use of other salmon (Table 3-108).

For other salmon, out of 22 respondents, there were five (23%) that did not get enough (Table 3-111). The impact of not getting enough other salmon was major (two households), minor (two households), or not noticeable (one household). These five households that did not have enough other salmon in 2016 used other subsistence foods (three responses), used more commercial foods (two responses), and increased harvest effort (one response) (Table 3-112).

Table 3-108.—Changes in household uses of salmon compared to recent years, Perryville, 2016.

Resource	Sampled households	Valid responses ^a	Households reporting use								Households not	
			Total households		Less		Same		More		using	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	26	25	23	92.0%	16	64.0%	17	68.0%	3	12.0%		
Chinook salmon	26	24	9	37.5%	2	8.3%	7	29.2%	0	0.0%	15	62.5%
Sockeye salmon—early run	26	23	23	100.0%	12	52.2%	9	39.1%	2	8.7%	0	0.0%
Sockeye salmon—late run	26	23	18	78.3%	5	21.7%	11	47.8%	2	8.7%	5	21.7%
Other salmon	26	24	22	91.7%	11	45.8%	11	45.8%	0	0.0%	2	8.3%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

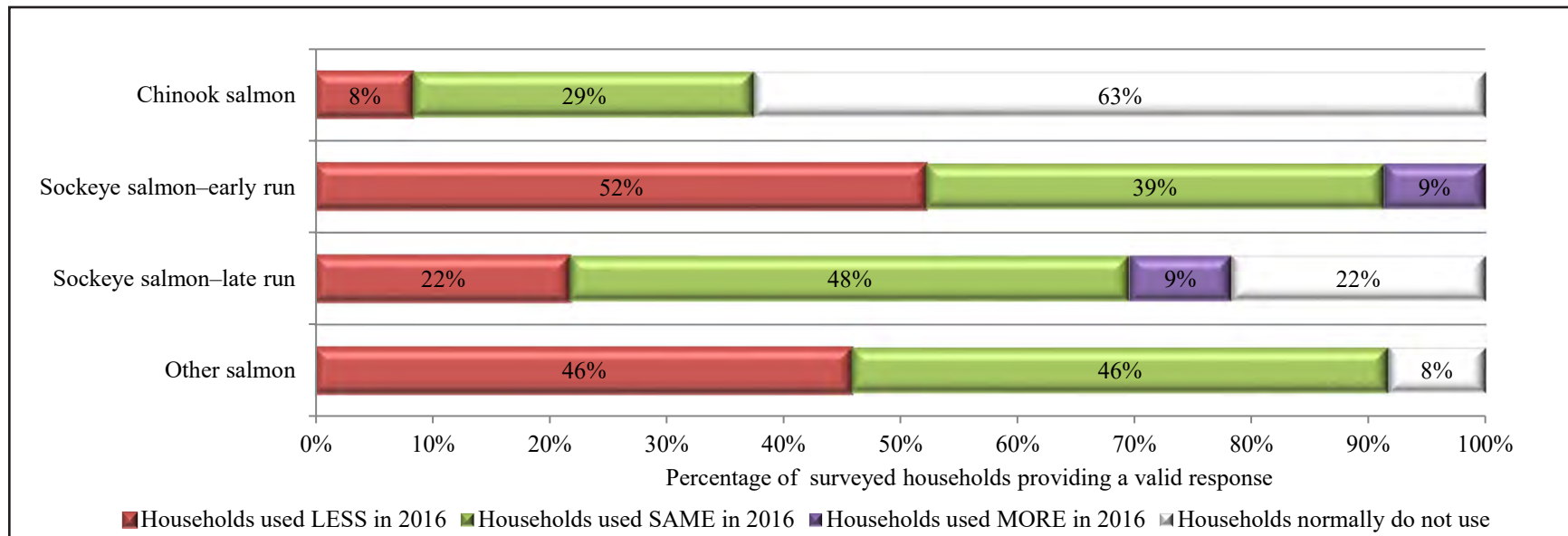


Figure 3-106.—Changes in household uses of salmon compared to recent years, Perryville, 2016.

Table 3-109.—Reasons for less household uses of salmon compared to recent years, Perryville, 2016.

Resource	Valid responses ^a	Households reporting reasons for less use	Family/ personal		Used other resources		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	25	15	0	0.0%	0	0.0%	6	40.0%	0	0.0%	0	0.0%	3	20.0%	2	13.3%	1	6.7%
Chinook salmon	24	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	1	50.0%	0	0.0%
Sockeye salmon—early run	23	11	0	0.0%	0	0.0%	3	27.3%	0	0.0%	0	0.0%	1	9.1%	1	9.1%	0	0.0%
Sockeye salmon—late run	23	4	0	0.0%	0	0.0%	2	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	24	11	0	0.0%	0	0.0%	5	45.5%	0	0.0%	0	0.0%	2	18.2%	0	0.0%	1	9.1%

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Table 3-109.—Continued.

Resource	Valid responses ^a	Households reporting reasons for less use	Weather/ environment		Working/ no time		Regulations		Resource small or diseased		Gas/equipment too expensive		Needed less		Competition		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	25	15	5	33.3%	5	33%	0	0.0%	0	0.0%	0	0.0%	1	6.7%	0	0.0%	1	6.7%
Chinook salmon	24	2	0	0.0%	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	23	11	1	9.1%	4	36%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	9.1%
Sockeye salmon—late run	23	4	1	25.0%	1	25%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	24	11	3	27.3%	1	9%	0	0.0%	0	0.0%	0	0.0%	1	9.1%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

Table 3-110.—Reasons for more household uses of salmon compared to recent years, Perryville, 2016.

Resource	Valid responses ^a	Households reporting reasons for more use	Used other resources		Increased availability		Went further		Got/fixed equipment		Received more		Increased effort		More success	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	25	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	66.7%	1	33.3%
Chinook salmon	24	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	23	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	100.0%	0	0.0%
Sockeye salmon—late run	23	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%
Other salmon	24	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 3-110.—Continued.

Resource	Valid responses ^a	Households reporting reasons for more use	Weather		Had more time		Regulations		Store-bought too expensive		Needed more		Substitute for unavailable resource(s)		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	25	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	66.7%	0	0.0%	0	0.0%
Chinook salmon	24	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	23	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	23	2	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	0	0.0%
Other salmon	24	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households that did not provide any response.

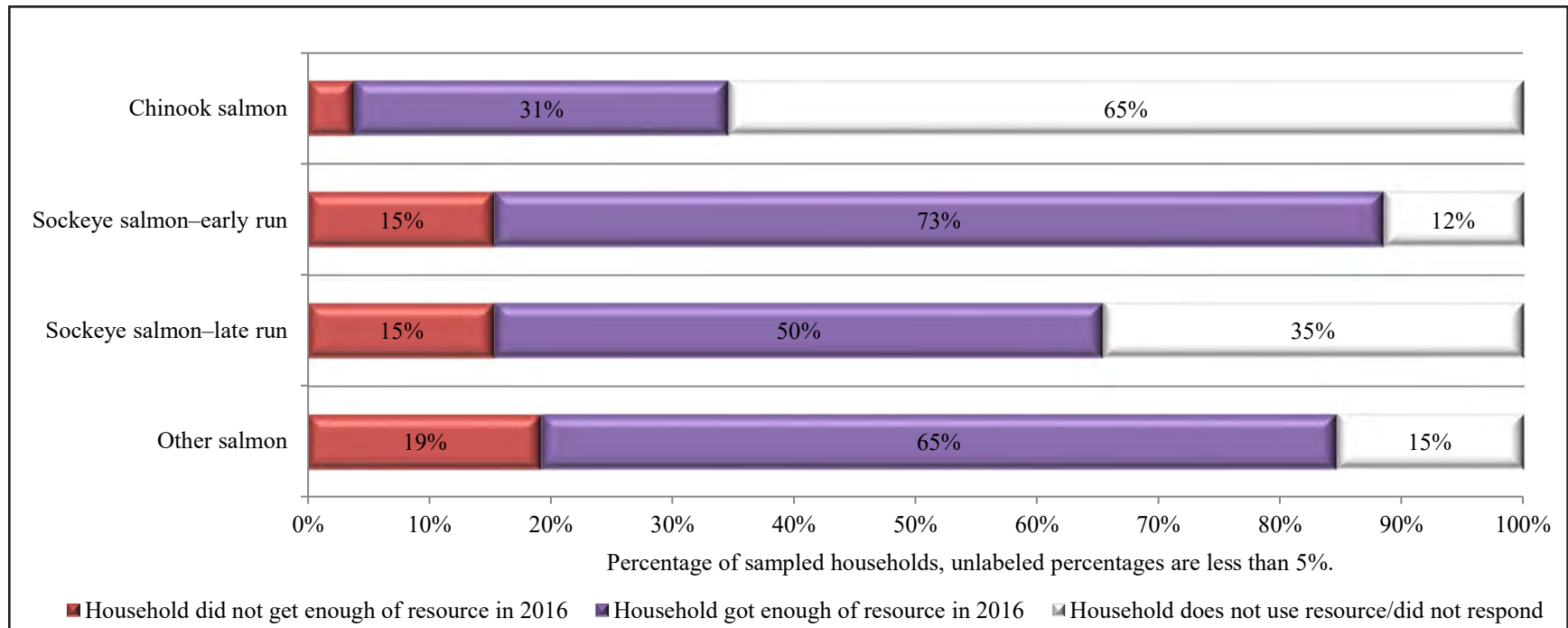


Figure 3-107.—Percentage of sampled households reporting whether they had enough resources, Perryville, 2016.

Table 3-111.—Reported impact to households reporting that they did not get enough of a type of resources, Perryville, 2016.

Resource	Sampled households	Households not getting enough				Impact to those not getting enough									
		Valid responses ^a		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	26	9	34.6%	1	11.1%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Sockeye salmon-early run	26	23	88.5%	4	17.4%	1	25.0%	0	0.0%	2	50.0%	1	25.0%	0	0.0%
Sockeye salmon-late run	26	17	65.4%	4	23.5%	1	25.0%	1	25.0%	1	25.0%	1	25.0%	0	0.0%
Other salmon	26	22	84.6%	5	22.7%	0	0.0%	1	20.0%	2	40.0%	2	40.0%	0	0.0%

Source: ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

Table 3-112.—Things households reported doing differently as the result of not getting enough of a resource, Perryville, 2016.

Resource	Valid responses ^a	Bought/bartered		Used more commercial foods		Used other subsistence foods		Asked others for help		Made do without	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	3	0	0.0%	2	66.7%	1	33.3%	0	0.0%	0	0.0%
Sockeye salmon—late run	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	5	0	0.0%	2	40.0%	3	60.0%	0	0.0%	0	0.0%

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Table 3-112.—Continued.

Resource	Valid responses ^a	Increased effort to harvest		Got a job		Ate elsewhere		Got public assistance		Other reasons	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	1	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	3	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	1	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	5	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

a. Valid responses do not include households failing to respond to the question and those households that never used the resource.

4. CHIGNIK MANAGEMENT AREA PERMIT DATA

COMPARISONS OF COMMERCIAL SALMON HARVEST RETENTION FROM COMMERCIAL FISH TICKETS AND HOUSEHOLD SURVEYS: 2014, 2015, AND 2016

Tables 4-1, 4-2, and 4-3 display the home pack harvests reported on commercial fish tickets and in household surveys for 2014, 2015, and 2016. Tables 4-1, 4-2, and 4-3 illustrate a significant difference between the amount of commercially retained salmon accounted for on returned commercial fish tickets and those accounted for in follow-up household surveys. For the study communities combined, in 2014 and 2015 the number of total salmon retained reported in household surveys exceeded the number reported on fish tickets by more than 1,000 fish; for 2016, the difference was more than double with approximately 2,500 more retained salmon reported in surveys than on fish tickets.

In 2014, commercial salmon fishers residing in the study communities did not report any home pack salmon on their commercial fish tickets (Table 4-1). However, in follow-up surveys for 2014, a total of 1,064 salmon, including 51 Chinook salmon, were reported to have been removed from commercial harvests by 19 surveyed households. Of the study communities from the Chignik Management Area (CMA), Chignik Bay reported the largest amount of home-use retention (606 salmon) and Chignik Lake reported the least (16 salmon). Chignik Lagoon retained the largest number of Chinook salmon: 35 fish.

In 2015, commercial salmon fishers from the CMA reported 60 home pack salmon on their commercial fish tickets, 9 of which were Chinook salmon (Table 4-2). Significantly, follow-up surveys for 2015 recorded a home-use retention total of 1,342 salmon, including 173 Chinook salmon removed from commercial harvests by 24 surveyed CMA households. The combined reported home-use retention total from both commercial fish ticket returns and follow-up surveys in 2015 was 1,399 salmon, including 179 Chinook salmon. Chignik Lagoon reported the largest amount of home-use retention in 2015 (604 salmon, including 120 Chinook salmon). Chignik Lake reported the least total amount of home-use salmon retained from commercial fishing: 218 salmon. Chignik Bay retained the least number of Chinook salmon (13 fish) followed by Chignik Lake (14 fish).

In 2016, commercial salmon fishers from the study communities reported 122 home pack salmon on their commercial fish tickets, 26 of which were Chinook salmon (Table 4-3). Follow-up surveys for 2016 recorded home-use retention of 2,573 salmon, including 287 Chinook salmon removed from commercial harvests by 31 surveyed households in the CMA. The combined reported home-use retention total from both commercial fish ticket returns and follow-up surveys in 2016 was 2,632 salmon, including 312 Chinook salmon. Chignik Bay reported the largest total amount of salmon home-use retention in 2016 (1,233 salmon). Chignik Lagoon reported the largest amount of Chinook salmon home-use retention (157 Chinook salmon). Chignik Lake reported the least number of salmon retained for home use (172 total salmon, including 24 Chinook salmon). There were approximately 100 more home pack Chinook salmon, and 1,100 more other salmon, reported on household surveys in 2016 than in 2015. A plausible explanation for why more Chinook salmon were retained from commercial harvests in the last study year could be because in 2016 the commercial harvest of Chinook salmon in the CMA was the highest since 1980¹: 125% higher than in 2015, and 134% higher than in 2014 (Wilburn and Stumpf 2017:13, 44). Therefore, fishermen perhaps were choosing to retain more Chinook salmon for personal use.

Table 4-1.—Comparison of commercial salmon retention based on commercial fish tickets and household surveys, study communities, 2014.

	Study communities					Communities outside the study area	Fishery total
	Chignik Bay	Chignik Lagoon	Chignik Lake	Perryville	Total		
Commercial retention							
<i>Commercial fish tickets</i>							
Commercial fish tickets reporting commercial home-use retention	0	0	0	0	0	5	5
Reported amount of commercial home-use retention from commercial fish tickets	0	0	0	0	0	41	41
Chinook salmon	0	0	0	0	0	35	35
Other salmon	0	0	0	0	0	6	6
<i>Household surveys</i>							
Number of survey respondents reporting home-use retention	5	7	3	4	19	n/a	n/a
Reported amount of commercial home-use retention on surveys	606	270	16	172	1,064	n/a	n/a
Chinook salmon	5	35	1	10	51	n/a	n/a
Other salmon	601	235	15	162	1,013	n/a	n/a
<i>Combined household surveys and commercial fish tickets</i>							
Number of households reporting home-use retention	5	7	3	4	19	5	24
Reported total amount of commercial home-use retention	606	270	16	172	1,064	41	1,105
Chinook salmon	5	35	1	10	51	35	86
Other salmon	601	235	15	162	1,013	6	1,019

Sources ADF&G Division of Commercial Fisheries database *OceanAK* and ADF&G Division of Subsistence household surveys, 2015.

Note "n/a" indicates data are not available because no household surveys occurred in the communities outside the study area.

Table 4-2.—Comparison of commercial salmon retention based on commercial fish tickets and household surveys, study communities, 2015.

	Study communities					Communities outside the study area	Fishery total
	Chignik Bay	Chignik Lagoon	Chignik Lake	Perryville	Total		
Commercial retention							
<i>Commercial fish tickets</i>							
Commercial fish tickets reporting commercial home-use retention	2	1	0	2	5	5	10
Reported amount of commercial home-use retention from commercial fish tickets	4	52	0	4	60	107	167
Chinook salmon	4	2	0	3	9	75	84
Other salmon	0	50	0	1	51	32	83
<i>Household surveys</i>							
Number of survey respondents reporting commercial home-use retention	6	11	4	3	24	n/a	n/a
Reported amount of commercial home-use retention from surveys	326	552	218	246	1,342	n/a	n/a
Chinook salmon	9	118	14	32	173	n/a	n/a
Other salmon	317	434	204	214	1,169	n/a	n/a
<i>Combined household surveys and commercial fish tickets^a</i>							
Number of households reporting home-use retention	8	12	4	4	28	5	33
Reported total amount of commercial home-use retention	330	604	218	247	1,399	107	1,506
Chinook salmon	13	120	14	32	179	75	254
Other salmon	317	484	204	215	1,220	32	1,252

Sources ADF&G Division of Commercial Fisheries database *OceanAK* and ADF&G Division of Subsistence household surveys, 2016.

Note "n/a" indicates data are not available because no household surveys occurred in the communities outside the study area.

a. The number of households retaining commercial harvests, and the reported harvest, may not equal the sum of those values from commercial fish tickets and household surveys because the number of households and reported harvest for household surveys and commercial fish tickets combined was reviewed to remove duplicate information.

Table 4-3.—Comparison of commercial salmon retention based on commercial fish tickets and household surveys, study communities, 2016.

	Study communities					Communities outside the study area	Fishery Total
	Chignik Bay	Chignik Lagoon	Chignik Lake	Perryville	Total		
Commercial retention							
<i>Commercial fish tickets</i>							
Commercial fish tickets reporting commercial home-use retention	3	4	0	0	7	8	15
Reported amount of commercial home-use retention from commercial fish tickets	45	60	0	0	122	282	404
Chinook salmon	9	17	0	0	26	9	35
Other salmon	36	60	0	0	96	273	369
<i>Household surveys</i>							
Number of survey respondents reporting commercial home-use retention	10	11	4	6	31	n/a	n/a
Reported amount of commercial home-use retention on surveys	1,191	991	172	219	2,573	n/a	n/a
Chinook salmon	54	140	24	70	287	n/a	n/a
Other salmon	1,137	851	149	149	2,286	n/a	n/a
<i>Combined household surveys and commercial fish tickets^a</i>							
Number of households reporting home-use retention	12	14	4	6	36	8	44
Reported total amount of commercial home-use retention	1,233	1,008	172	219	2,632	282	2,914
Chinook salmon	62	157	24	70	312	9	321
Other salmon	1,171	851	149	149	2,320	273	2,593

Sources ADF&G Division of Commercial Fisheries database *OceanAK* and ADF&G Division of Subsistence household surveys, 2017.

Note "n/a" indicates data are not available because no household surveys occurred in the communities outside the study area.

a. The number of households retaining commercial harvests, and the reported harvest, may not equal the sum of those values from commercial fish tickets and household surveys because the number of households and reported harvest for household surveys and commercial fish tickets combined was reviewed to remove duplicate information.

EVALUATING SUBSISTENCE SALMON PERMIT SYSTEM HARVEST ESTIMATES FROM BEFORE AND AFTER POSTSEASON HOUSEHOLD SURVEYS

As discussed in Chapter 1, each year, CMA subsistence salmon permits are issued and collected to estimate harvests by residents of each community. In addition, postseason household salmon harvest surveys have been conducted in the CMA communities of Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville when funding has been available to do so. When postseason salmon harvest surveys have been administered, the harvest data complemented the permit system data and increased the accuracy of documented subsistence salmon harvest amounts.

As part of this study, harvest amounts from household surveys have been reconciled against data from permits that were issued and returned both before and during the time when postseason surveys were administered. Reconciliation of returned permit data and household survey data was achieved by determining which household the permittee resided in and—if a postseason household survey was completed—the harvest data reported on one’s individual permit was compared with the survey data for the household in which the permittee or permittees resided. Since the permits are issued to individuals, often there was more than one permit issued per household, which was factored in when comparing data sets. Any differences have been accounted for to prevent double counting when both data sets were integrated.

If individuals did not return their permit prior to the household survey being conducted, but a survey was conducted for the household in which they resided, then the survey data were added to their permit and the permit was counted as “returned.” If a household was surveyed and no member of the household had acquired a permit, but the survey determined subsistence salmon were caught, then one ex post facto permit was issued with harvest information added and the permit was counted as “returned.” Finally, households that were surveyed but did not fish, and also did not acquire a permit, were not issued an ex post facto permit. The data were analyzed based on the reconciled results from permits and surveys and expanded to include total permits (including ex post facto permits) issued.

In years after 1993 when postseason household surveys were not conducted (2009, 2010, 2012, and 2013), to compensate for the likely underestimated reported harvest (as determined from years when postseason surveys were conducted), the average annual additional harvest from postseason surveys for 1999–2008 and 2011 was added to the permit harvests to estimate the total subsistence harvests (Fall et al. 2019:131). This section reviews the changes to the reported and estimated salmon harvests as the result of reconciling postseason survey data with returned permits for 2014–2016, which helps to evaluate how well the permit system generally performs as a tool for documenting harvests.

Tables 4-4, 4-5, and 4-6 each feature: 1) subsistence salmon permit participation and harvest estimates for the study communities based on permit returns before the surveys occurred, 2) harvests recorded during postseason surveys by members of households that fished without a permit, and 3) harvest estimates based on permit returns and postseason surveys.

The “before surveys” section of the tables displays the number of permits issued and returned to ADF&G from each of the study communities and from individuals residing in any other Alaska community combined, along with an initial permit return rate. The reported harvest amounts from prior to postseason household surveys being administered represented the total reported subsistence salmon harvest in the CMA² and all Alaska communities based on returned permits, and total harvest estimates were based on the total number of issued permits. Note that without face-to-face postseason household surveys occurring, these are the harvest estimates that would have been published in the Alaska Subsistence Fisheries Database (ASFDB) and used to inform fisheries management decisions.

Though attempted, the Division of Subsistence was not able to conduct surveys in every household in the CMA study communities during project study years, nor with individuals who had obtained a subsistence permit but resided in an Alaska community other than the study communities. The “after surveys” section

2. While Ivanof Bay is also located in the CMA, no permits were issued for that community in 2014–2016 due to there being no permanent year-round households (Fall et al. 2017:138; 2018:128; 2019:124).

shows how many permits were collected in the field from those who fished with a permit but had not returned the permit to ADF&G, as well as how many surveyed households were identified as having at least one member who fished without a permit and consequently was issued one ex post facto permit that was completed with harvest information from the survey and then counted as “returned.” The “after surveys” portion of the tables also shows postseason survey efforts resulted in added reported salmon harvests for every study community in every study year (except in Chignik Lake in 2016 when no reported harvests were added to permits). The added harvests included late-season catches and salmon harvested by households that fished without a permit. The row “revised estimated harvest from permits” presents the final harvest estimate acquired by reconciling the permits issued with what was reported on household surveys. This includes permits returned by individuals residing in households that were not surveyed and permits obtained and returned by individuals who cited the study community as a place of residence but were not included in the postseason household survey list of permanent community households, as well as individuals who were issued permits and who resided in a community outside the study area. These harvest estimates are published in the ASFDB and the Division of Subsistence’s annual report summarizing subsistence and personal use fisheries; these values represent the permit system’s estimation of each community’s total harvest. For comparison, the end of the tables shows the estimated harvests based on postseason household surveys only.

Subsistence Salmon Permit Returns and Follow-up Surveys

There was a significant difference between the salmon harvests accounted for only on returned permits prior to postseason surveys being administered and the harvests accounted for by combining permit data and data from postseason subsistence harvest surveys. The postseason household surveys revealed that salmon harvests by study community households in the CMA that did not have permits were significant. In two study years (2014 and 2015), according to postseason surveys, more than 4,000 additional salmon were harvested for the study communities combined than were reported on permits returned prior to survey administration.

In 2014, 57 permits were initially issued to residents of the CMA study communities, 28 were returned (49% return rate), and the total reported harvest by residents of these communities was 2,874 salmon, including 19 Chinook salmon (Table 4-4). The expanded estimated 2014 subsistence harvest for the study communities was 6,252 salmon, including 34 Chinook salmon. Survey results indicated that out of the total of 89 subsistence permits issued to residents of local communities for 2014, 32 (36%) were issued following the surveys to a member of each household that engaged in subsistence fishing but did not include any members who held permits while fishing. After ex post facto permits were issued, the revised number of issued permits increased from 57 to 89 (56% increase). Residents of Perryville obtained the most permits before postseason surveys were conducted with 28 permits issued and 13 returned (46% return rate) and Chignik Lake had the least permits issued: 8 permits, only 1 of which was returned (13% return rate). Postseason household surveys resulted in more permits being issued to households in Chignik Bay who fished without a permit during the season—9 out of 18 total permits issued, or 50% of all permits issued to Chignik Bay residents—than any other local community, followed by Chignik Lake—5 out of 13 permits, or 38%. Counting both initial permits and ex post facto permits issued, Perryville was issued the most total permits (39) and returned the most (36 permits; 92%). Chignik Lake was issued the fewest permits (13) but had the highest final permit return rate (100%). Harvest estimates based on the household surveys alone estimated that 9,542 fish were harvested, including 133 Chinook salmon (1%); however, this estimate does not include harvests of 507 salmon by residents from outside the study communities that were estimated based on permit returns.

Follow-up surveys enabled the return of an additional 53 permits for a total of 81 subsistence salmon permits by CMA study community residents collected for 2014 and yielded an updated permit harvest report of 7,075 total salmon, including 133 Chinook salmon. The revised 2014 subsistence salmon harvest estimate for CMA study communities, based on all harvests reported on permits after follow-up surveys occurred, was 9,443 salmon, including 146 Chinook salmon representing nearly 2% of the total salmon harvest for the study communities. Perryville had the highest subsistence salmon harvest of the study communities (3,150

salmon). Perryville was estimated to have harvested the most Chinook salmon of the study communities, too: 96 fish out of 146, or 66%.

Initially, the estimated salmon harvest by all Alaska resident permit holders who harvested from the CMA in 2014 was 6,759 salmon, including 36 Chinook salmon. Following the postseason survey effort, which resulted in 32 more permits being issued in the study communities, the final estimated CMA harvest by all resident permit holders increased by 47% to 9,950 salmon, including 148 Chinook salmon harvested.

In 2015, 43 permits were initially issued to residents of the study communities, 34 were returned (79% return rate), and the total reported harvest was 4,370 salmon, including 110 Chinook salmon (Table 4-5). The expanded estimated 2015 subsistence harvest for study community residents was 5,575 salmon, including 157 Chinook salmon. The postseason household surveys revealed that salmon harvests by surveyed households that did not have permits issued to any residents were significant. Survey results indicated that out of the total 89 subsistence permits issued to residents of local communities for 2015, 46 (52%) were issued following the surveys to a member of each household that engaged in subsistence fishing but did not include any members who held permits while fishing. After ex post facto permits were issued, the revised number of issued permits increased from 43 to 89 (107% increase). Residents of Perryville obtained the most permits before postseason surveys were conducted with 20 permits issued and 17 returned (85% return rate) and Chignik Lake had the least permits issued—only one was issued and it was returned (100% return rate). Postseason household surveys resulted in more permits being issued to households in Chignik Lake who fished without a permit during the season—19 out of 20 total permits issued, or 95% of all permits issued to Chignik Lake residents—than any other local community, followed by Chignik Bay—7 out of 14 permits, or 50%. Considering initial permits and ex post facto permits issued combined, Perryville residents were issued and returned the most permits: 35 permits, with 33 returned (94%); by comparison, the least number of permits were issued to and returned by Chignik Bay: 14 permits, with 12 returned (86%). A total of 20 permits were issued to each Chignik Lagoon and Chignik Lake, and all issued permits were returned after postseason surveys had been completed (100% return rate).

After follow-up surveys, a total of 85 returned subsistence salmon permits out of 89 issued (96% return rate) for 2015 for the study communities yielded an updated permit harvest report of 10,156 salmon, including 143 Chinook salmon. Based on all harvests reported on permits after follow-up surveys occurred, the revised 2015 subsistence salmon harvest estimate for the study communities was 10,567 salmon, including 154 Chinook salmon that composed approximately 1% of the total salmon harvest estimate. Perryville was the highest subsistence salmon harvester of the CMA study communities: an estimated 3,798 total salmon. Chignik Bay was estimated to have harvested the most Chinook salmon of the study communities (63 fish). By comparison, harvest estimates from the survey data alone estimated slightly fewer fish were harvested: 10,303 fish, including 109 Chinook salmon (1%).

A total of 34 permits were issued to and 34 returned by (100%) individuals residing in other Alaska communities, and the total estimated harvest was 1,554 salmon, including 6 Chinook salmon. For the entire CMA in 2015, residents of all Alaska communities, based on a total of 123 permits issued and 97% of permits returned, harvested a total estimated 12,121 salmon, of which 160 were Chinook salmon (1%). Initially, the estimated salmon harvest by all Alaska resident permit holders who harvested from the CMA in 2015 was 6,983 salmon. Following the postseason survey effort, which resulted in 46 more permits being issued in the study communities, the final estimated CMA harvest by all resident permit holders increased 74%, or by more than 5,000 fish, but with no additional Chinook salmon added to the harvest estimate.

In 2016, 44 permits were initially issued to residents of the four CMA study communities, 21 permits were returned (48% return rate), and the total reported harvest was 2,802 salmon (Table 4-6). The expanded estimated 2016 subsistence harvest for study community residents was 6,061 salmon, including 47 Chinook salmon. Survey results indicated that out of the total 83 subsistence permits issued to residents of local communities for 2016, 39 (47%) were issued following the surveys to a member of each household that engaged in subsistence fishing but did not include any members who held permits while fishing. After ex post facto permits were issued, the revised number of issued permits increased from 44 to 83 (89% increase). Residents of Chignik Lagoon obtained the most initial permits with 19 permits issued, 8 of which

were returned (42% return rate), and Chignik Lake residents were issued the fewest permits: three permits issued and one returned (33% return rate). Postseason household surveys resulted in more permits being issued to households in Chignik Lake who fished without a permit during the season—17 out of 20 total permits issued, or 85%—than any other local community, followed by Perryville—11 out of 25 permits, or 44%. Considering all issued and collected permits, including ex post facto permits, Chignik Lagoon and Perryville were issued and returned the most permits: 26 issued with 22 returned (85%) and 25 issued with 22 returned (88%), respectively. By comparison, the least permits were both issued to and returned by Chignik Bay residents: 12 permits were issued and 9 (75%) were returned.

During follow-up surveys, an additional 50 subsistence salmon permits were returned by CMA study community residents for 2016. Updated permit participation yielded a revised permit-based harvest estimate of 7,861 salmon, including 55 Chinook salmon, for the study communities combined. Perryville and Chignik Lagoon are where the highest total harvests occurred: 2,777 and 2,760 total subsistence salmon harvested, respectively. Chignik Lagoon was estimated to have harvested the most Chinook salmon of the study communities: 41 fish. Harvest estimates from the survey data alone estimated slightly fewer fish harvested by the study communities: 6,758 fish, including 78 Chinook salmon composing 1% of the harvest.

There was a total of 35 permits issued to and 22 permits returned by individuals residing in other Alaska communities—a 63% return rate. The total reported harvest from permits returned by Alaskans who lived outside the CMA was 528 salmon, including 7 Chinook salmon, and the expanded estimated harvest by these other communities was 1,307 salmon, of which 42 were Chinook salmon. For the entire CMA in 2016, harvests by residents of all Alaska communities, based on a total of 118 permits issued and 93 permits (79%) returned, totaled an estimated 9,168 salmon, of which 97 (1%) were Chinook salmon, which is 22% higher than the initial estimated salmon harvest of 7,184 salmon.

Table 4-4.—Subsistence salmon permit participation and harvest estimates based on returned permits and surveys, study communities, 2014.

	Study communities					Communities outside the study area	Fishery total
	Chignik Bay	Chignik Lagoon	Chignik Lake	Perryville	Total		
Subsistence harvests							
<i>Before surveys^a</i>							
Number of permits issued	9	12	8	28	57	24	81
Number of permits returned	4	10	1	13	28	20	48
Return rate	44.4%	83.3%	12.5%	46.4%	49.1%	83.3%	59.3%
Reported harvest	216	1,232	208	1,218	2,874	493	3,367
Chinook	2	8	0	9	19	2	21
Other salmon	214	1,224	208	1,209	2,855	491	3,346
Estimated harvest, all permit holders	486.0	1,478.4	1,664.0	2,623.4	6,251.8	507	6,758.8
Chinook	4.5	9.6	0	19.4	33.5	2	35.5
Other salmon	481.5	1,468.8	1,664.0	2,604.0	6,218.3	505	6,723.3
<i>After surveys^a</i>							
Households that fished without a permit ^b	9	7	5	11	32	n/a	n/a
Number of permits issued ^c	18	19	13	39	89	24	113
Number of previously issued permits returned during survey	1	1	7	12	21	n/a	n/a
Number of permits returned ^c	14	18	13	36	81	20	101
Additional harvest added to previously returned permits and permits returned during the survey	896	340	2,661	304	4,201	14	4,215
Total harvest reported on permits	1,112	1,572	2,869	1,522	7,075	507	7,582
Chinook	13	26	5	89	133	2	135
Other salmon	1,099	1,546	2,864	1,433	6,942	505	7,447
Revised estimated harvest from permits	1,636.7	1,787.1	2,869.0	3,150.3	9,443.1	507.0	9,950.1
Chinook	16.7	27.4	5.0	96.4	145.6	2.0	147.6
Other salmon	1,620.0	1,759.6	2,864.0	3,053.9	9,297.5	505.0	9,802.5
Estimated harvest from surveys	1,028.4	1,712.6	4,136.0	2,665.2	9,542.2	n/a	n/a
Chinook	15.6	18.8	6.8	91.8	133.0	n/a	n/a
Other salmon	1,012.8	1,693.8	4,129.2	2,573.4	9,409.2	n/a	n/a

Sources ASFDB 2018 (ADF&G 2020) and ADF&G Division of Subsistence household surveys, 2015.

Note "n/a" indicates data are not available because no household surveys occurred in the communities outside the study area.

a. Does not include commercial home-use retention, but does include rod and reel harvests.

b. Households were issued ex post facto permits if they did not get a permit, but indicated that they did fish on household surveys.

c. Includes respondents that fished with a permit and those who were issued an ex post facto permit during household survey administration.

Table 4-5.—Subsistence salmon permit participation and harvest estimates based on returned permits and surveys, study communities, 2015.

	Study communities					Communities outside the study area	Fishery total
	Chignik Bay	Chignik Lagoon	Chignik Lake	Perryville	Total		
Subsistence harvests							
<i>Before surveys^a</i>							
Number of permits issued	7	15	1	20	43	34	77
Number of permits returned	4	12	1	17	34	32	66
Return rate	57.1%	80.0%	100.0%	85.0%	79.1%	94.1%	85.7%
Reported harvest	561	1,894	157	1,758	4,370	1,408	5,778
Chinook	43	48	2	17	110	4	114
Other salmon	518	1,846	155	1,741	4,260	1,404	5,664
Estimated harvest, all permit holders	981.8	2,367.5	157.0	2,068.2	5,574.5	1,408.0	6,982.5
Chinook	75.3	60.0	2.0	20.0	157.3	4.0	161.3
Other salmon	906.5	2,307.5	155.0	2,048.2	5,417.2	1,404.0	6,821.2
<i>After surveys^a</i>							
Households that fished without a permit ^b	7	5	19	15	46	n/a	n/a
Number of permits issued ^c	14	20	20	35	89	34	123
Number of previously issued permits returned during survey	1	3	0	1	5	n/a	n/a
Number of permits returned ^c	12	20	20	33	85	34	119
Additional harvest added to previously returned permits and permits returned during the survey	603	1,136	2,224	1,823	5,786	146	5,932
Total harvest reported on permits	1,164	3,030	2,381	3,581	10,156	1,554	11,710
Chinook	54	54	2	33	143	6	149
Other salmon	1,110	2,976	2,379	3,548	10,013	1,548	11,561
Revised estimated harvest from permits	1,358.0	3,030.0	2,381.0	3,798.0	10,567.0	1,554.0	12,121.0
Chinook	63.0	54.0	2.0	35.0	154.0	6.0	160.0
Other salmon	1,295.0	2,976.0	2,379.0	3,763.0	10,413.0	1,548.0	11,961.0
Estimated harvest from surveys	808.0	3,143.3	2,524.0	3,827.1	10,302.5	n/a	n/a
Chinook	14.5	38.3	2.1	54.4	109.3	n/a	n/a
Other salmon	793.5	3,104.9	2,522.0	3,772.8	10,193.2	n/a	n/a

Sources ASFDB 2018 (ADF&G 2020) and ADF&G Division of Subsistence household surveys, 2016.

Note "n/a" indicates data are not available because no household surveys occurred in the communities outside the study area.

a. Does not include commercial home-use retention, but does include rod and reel harvests.

b. Households were issued ex post facto permits if they did not get a permit, but indicated that they did fish on household surveys.

c. Includes respondents that fished with a permit and those who were issued an ex post facto permit during household survey administration.

Table 4-6.—Subsistence salmon permit participation and harvest estimates based on returned permits and surveys, study communities, 2016.

	Study communities					Communities outside the study area	Fishery total
	Chignik Bay	Chignik Lagoon	Chignik Lake	Perryville	Total		
Subsistence harvests							
<i>Before surveys^a</i>							
Number of permits issued	8	19	3	14	44	35	79
Number of permits returned	2	8	1	10	21	22	43
Return rate	25.0%	42.1%	33.3%	71.4%	47.7%	62.9%	54.4%
Reported harvest	99	1,666	160	877	2,802	528	3,330
Chinook	0	1	0	2	3	7	10
Other salmon	99	1,665	160	875	2,799	521	3,320
Estimated harvest, all permit holders	396.0	3,956.8	480.0	1,227.8	6,060.6	1,122.9	7,183.5
Chinook	0.0	19.0	0.0	28.0	47.0	14.2	61.2
Other salmon	396.0	3,937.8	480.0	1,199.8	6,013.6	1,108.7	7,122.3
<i>After surveys^a</i>							
Households that fished without a permit ^b	4	7	17	11	39	n/a	n/a
Number of permits issued ^c	12	26	20	25	83	35	118
Number of previously issued permits returned during survey	3	7	0	1	11	n/a	n/a
Number of permits returned ^c	9	22	18	22	71	22	93
Additional harvest added to previously returned permits and permits returned during the survey	4	77	0	10	91	0	91
Total harvest reported on permits	103	1,743	160	887	2,893	528	3,421
Chinook	0	1	0	2	3	7	10
Other salmon	103	1,742	160	885	2,890	521	3,411
Revised estimated harvest from permits	623.0	2,760.0	1,701.0	2,777.0	7,861.0	1,307.0	9,168.0
Chinook	3.0	41.0	2.0	9.0	55.0	42.0	97.0
Other salmon	620.0	2,719.0	1,699.0	2,768.0	7,806.0	1,265.0	9,071.0
Estimated harvest from surveys	536.6	1,617.2	1,840.9	2,763.6	6,758.4	n/a	n/a
Chinook	2.3	44.2	5.9	25.6	78.0	n/a	n/a
Other salmon	534.4	1,573.0	1,835.0	2,738.0	6,680.4	n/a	n/a

Sources ASFDB 2018 (ADF&G 2020) and ADF&G Division of Subsistence household surveys, 2017.

Note "n/a" indicates data are not available because no household surveys occurred in the communities outside the study area.

a. Does not include commercial home-use retention, but does include rod and reel harvests.

b. Households were issued ex post facto permits if they did not get a permit, but indicated that they did fish on household surveys.

c. Includes respondents that fished with a permit and those who were issued an ex post facto permit during household survey administration.

THE UTILITY OF ANNUAL PERMIT DATA

Below are a few observations about the above-reported and discussed significant differences between the permit and survey data combined and the household survey data.

- When postseason household surveys occur, the number of subsistence permits both issued and returned notably improves. The reported harvest numbers therefore increase since households that did not return a permit become accounted for, and households that may have inaccurately or incompletely reported harvests for a variety of reasons are able to correct reported harvests on permits.
- Some households do not obtain a permit each year, particularly in Chignik Lake and Perryville. Perryville is more distant and isolated from the other communities and not near the main commercial fishing facilities or the ADF&G weir, and ADF&G employees are not present in the community in the summer. Perryville residents who are subsistence fishing but not participating in commercial fisheries may not see the need to get a permit. Many residents of Perryville fish for salmon using a rod and reel since they do not have a net or boat to obtain salmon otherwise, and because of this not all are aware that a permit is required to obtain salmon for subsistence regardless of gear used. Vendors are sent permits in every community, but there may be a lack of advertising for permit distributions. Aside from Division of Subsistence researchers visiting throughout the years, residents have no ADF&G employees present in the community to remind them to obtain a permit or to answer questions. Chignik Lake is the community closest to the ADF&G weir where permits may be obtained as well as from the local vendor. It is unclear why more people do not get permits at Chignik Lake, though some respondents have expressed that they have and always will get their salmon and do not feel the need to get a permit to do so.
- Even though permits are not required to be returned with harvest reporting to ADF&G until after December 31, many households return their permits at the end of the summer season before they do the majority of their spawned-out sockeye, coho, and pink salmon fishing.
- Some households believe that if they require more fish to feed their families than the permit allows, that recording a harvest overage might get them into trouble with enforcement officers, or it could negatively affect their personal and community subsistence rights because they believe that those who are unfamiliar with the subsistence way of life do not fully understand how their community harvest and sharing patterns operate. It is important to note that ADF&G will issue a second permit to anyone in need of additional fish above the 250 salmon allowed per permit.
- It is also important to note that while subsistence salmon permits are issued to an individual, other members of a household can acquire separate permits if more fish are needed for the overall household. 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. It is recommended that the CMA permit be revised by the BOF from an individual permit to a household permit so that members of households are listed on a household permit and all harvests for the household are recorded on one permit. This will cause less confusion, more precise recording, and less opportunity for potential violations if a person is helping a family member fish but is not in possession of a personal permit, which is illegal under the current individual permit requirements. Though not all areas of Alaska require subsistence permits

for harvesting salmon, the CMA is one of the few management areas where individual, rather than household, subsistence fishing permits are issued.

- Households are inconsistent about how they record the salmon they take home from their commercial catches, and many times these fish never get accounted for unless there is a household harvest survey. Subsistence fishers often do not differentiate between commercial harvest as home pack and food to feed their families; to them, if it is brought home it is subsistence. Some people record their home pack on their subsistence permits and others on fish tickets and some do not record home pack at all.

There is a need to improve communication between ADF&G and commercial fishermen, subsistence fishermen, canneries, and tenders so all fishers better understand the need for and use of accurate reporting of subsistence harvests and home pack. Also, better communication between ADF&G and the communities is needed to improve community and individual trust relative to reporting.

It is important to note that collecting subsistence salmon permit data through household surveys is advantageous for developing the most accurate annual subsistence salmon harvest information from the CMA, for illustrating how subsistence harvests and uses change over the course of time, and also can help with determining the amount of the harvestable surplus that is reasonably necessary for subsistence. A positive relationship with the communities of Chignik Lake, Chignik Lagoon, Chignik Bay, and Perryville bolsters residents' understanding of the importance of and reasoning behind the permit system and provides a vehicle for ongoing conversations and engagement in the use and management of salmon in the region.

5. SALMON STOCK CHANGE OBSERVATIONS

INTRODUCTION

Yes, all of these changes to the environment and our resources worry me, but my people have lived here, fished here, and hunted here since the beginning of time. We will adapt as we always have done. (PVL 1)

Documenting local knowledge of Chinook salmon and the recent decline of runs is vital for creating a future comprehensive management plan for the species. This study sought to collect important knowledge held by resource users in the four study communities. Three research methods were implemented to obtain observations: supplemental assessment questions were asked of all surveyed households, informal field notes were taken during each community research trip, and semi-structured and non-structured key respondent interviews (KRIs) were conducted in all four study communities in 2014 and 2017. There were 38 KRIs conducted with 30 respondents. Twenty-two in-depth, semi-structured KRIs were audio recorded and guided by interview protocols; an additional 16 non-structured interviews that tended to address specific topics about which a respondent was uniquely knowledgeable (e.g., Chinook salmon abundance at a specific location 50 years ago) occurred, and quotes were documented by researchers. Appendix B presents each KRI protocol used in 2014 and 2017, as well as a list of priority questions used in the field throughout all the trips to communities. The KRI protocols used in 2014 and 2017 focused on guiding discussions with KRIs to learn about harvesting and processing practices, and use of, the Chignik Chinook salmon stock, and also other patterns regarding long-term changes in the biology of the fish (size, appearance, behavior), local environmental conditions, habitat changes, run migration changes, and other human-caused effects such as pollution, commercial and sport fishing, or management of the Chinook salmon stock.

Local and traditional knowledge (LTK) was collected during interviews conducted with elders and other residents in the study communities who were knowledgeable about Chinook salmon. Key respondents were either referred by local tribal governments, selected when household surveys were conducted, or identified by the Principal Investigator who has been working in these communities for longer than two decades. Though a variety of potential respondents were considered, individuals who were identified as holding significant observations of Chinook salmon, salmon habitat, and a broad understanding of Chinook salmon in the Chignik Management Area (CMA) were primarily asked to be interviewed. Throughout the entire study, key respondents were generally asked to provide information about the following priority topics: 1) Chinook salmon harvest methods, 2) observed changes in the population of Chinook salmon returning to the Chignik watershed, and 3) perceived causes for the decline of Chinook salmon (see Appendix B).

Results of the analysis of qualitative data and household survey responses are presented in this chapter. A note to the reader regarding some of the participant quotes presented in this chapter: most respondents referred to Chinook salmon as “king salmon” or “kings.” *Aamasuuk*¹ is the Alutiiq name for king salmon used by two of the elders to identify Chinook salmon (PVL 5; CLK 11). Also, respondents referred to sockeye salmon as “reds,” coho salmon as “silvers,” and the term “red fish” was used to describe sockeye salmon caught in fresh water or spawning or spawned-out salmon. Quotes are attributed using a code that combines a community name shorthand² with a respondent number and reflects the breadth of key respondent sources that addressed key topics.

METHODS FOR HARVESTING AND PROCESSING CHINOOK SALMON

Chinook Harvest Methods

Key respondents indicated that residents obtained much of their Chinook salmon for home use from commercial harvests (commonly referred to as “home pack”), followed by personal harvests by rod and

1. Native Village of Afognak. “Dictionary.” <http://www.alutiiqlanguage.org/dictionary> (accessed August 2020).

2. Note: CHG = Chignik Bay; CLG = Chignik Lagoon; CLK = Chignik Lake; PVL = Perryville.

reel. Respondents from all four communities said that residents have always used rod and reel to harvest Chinook salmon from the Chignik River and from the beach adjacent to Perryville.

We don't eat much king salmon, but we will get one or two a year. When I was a kid, we would go with Dad in the skiff down the river and catch two or three kings using a fishing pole. It is fun to catch them that way and just how we always did it. We don't try to catch them with a gillnet because the nets we use have too small of [an] opening, but sometimes I have caught a king while fishing for sockeye at [the] mouth of the river in my net. (CLK 10)

Most guys here fish for reds with a gillnet. The king run isn't that large here, and locals mostly want the reds. If a person wants a king, they just go get one in the river in their skiff and catch them with a pole. Nets cost money and I don't know of anyone that has a net to catch a king. You would need about a 7- or 8-inch mesh to do that; then you might catch more than you need. No one wants to waste fish. We have always caught kings using a rod and reel up in Chignik River. My dad and uncles did this too, and I am 70 years old. Kings are my family's favorite fish. We also put up reds, too, and dry red fish. Variety is important. You don't want to eat the same thing all the time do you? Imagine eating a hamburger every day ... (CLG 1)

We will put a net out front [of village] or use a hook to catch kings when they are traveling by ... last few years we have caught lots of kings and reds off the beach ... things are changing, the ocean channels have changed, bringing fish closer to the beach. (PVL 1)

We like to get a couple of kings every year and usually make a trip in our skiff to fish for kings up in the river there below the weir. We use a pole to catch them ... we bring them home, brine and smoke and kipper them or just cook them up! (CHG 1)

One respondent from Chignik Lagoon (CLG 1) said that a larger 7- or 8-inch mesh gillnet would be needed to catch a Chinook salmon rather than the 6-inch mesh that is used by most subsistence harvesters to target sockeye and coho salmon. Another respondent from Chignik Lake (CLK 4) said occasionally a Chinook salmon is caught in a gillnet while fishing for sockeye salmon, but only if it is a very small Chinook salmon or it gets rolled up in the bottom of the net. Respondents thought that there was no motivation to go to the expense of hanging a larger mesh gillnet to be able to catch a handful of Chinook salmon and potentially catch more fish than desired.

I have always got my kings up there in the river using a rod and reel. My dad did this too, lots of people do. A few years ago, ADF&G told me it was illegal to get my kings that way, and they said I needed a sport fish license if I want to use a rod to catch kings for subsistence, I don't understand why not? I hung a king net once, because if ADF&G stopped me from fishing for my kings using a rod, I wanted to still be able to get my kings, but I never have used it. (CLG 1)

It is hard to catch kings in a gillnet; our mesh size is too small. If we catch one it is because it gets wrapped in the net. Also, kings tend to swim under the net. We usually use a rod and reel, rod to cast then jig hook to catch kings ... we have always done it that way, and Fish and Game says you need a sport fish license to catch kings, but we eat them; we aren't just playing with them. The feds though allow we locals to catch kings using a rod and reel I understand. (CLK 4)

A researcher noted that, according to a Chignik Lagoon resident, when a commercial fisher harvests several Chinook salmon, the fish will be taken home for personal use rather than delivered to the fish buyer or processor.

If we don't have time to subsistence fish for our kings, we remove them from our commercial harvest as home pack. The canneries don't pay that much for kings and we would rather eat them. (CLG 1)

Others similarly emphasized obtaining Chinook salmon from commercial home pack or fishing with rod and reel gear.

We get our kings from our commercial catches when the kings arrive in the lagoon. Because we are too busy [commercial] fishing, and because the flies are out, we will freeze our kings whole and thaw them and smoke them in October or as late as following spring April. We usually smoke half in fall and half in spring. (CLG 2)

Some people smoke kings. I don't care for kings, they are too oily, too fat. But there are people that go after kings. They will get them from above Bear Creek up to FRI Point. Also, right at the end of the landing. The weir is below Bear Creek. You can get the kings from the fishing boats, too. Because a lot of the time the tenders won't give much money for them. So, they take them home. They usually get the kings here by the island [Chignik River]. Also, down in Dego Channel [in Chignik Lagoon], they get kings in July there, too. Purse seines get them, and a rod and reel get them. It's always been rod and reel or guys get them from the fishing boats. Because a lot of guys don't want to give them to the tenders because they don't get much money. So, the guys will take them home and smoke them or freeze them or can them, whichever. I will just get them with a rod or from a fishing boat. I have never seen anybody use a net or gillnet to get them. If you use a regular gillnet, I don't know of anyone getting a king with it. (CLK 2)

In summary, most Chinook salmon are harvested for home use by study community residents through retention from commercial harvests. The second most used method for harvesting Chinook salmon is rod and reel. Because of the small number of Chinook salmon desired by study community residents, there is no need for residents to use a gillnet for harvesting Chinook salmon, though some are caught in a gillnet while fishing for sockeye salmon.

Chinook Processing Methods

Chignik Lake and Chignik Bay residents tend to believe that Chinook salmon are too oily and fatty for kippering and smoking, so they desire this species less than other salmon. However, respondents from each community who used Chinook salmon said they do process the species by smoking, kippering, or freezing, or respondents eat the fish fresh.

When asked about using Chinook salmon, a Chignik Lake resident (CLK 10) commented, "Our folks would have kings, they cut them in strips and smoked them. But I don't use kings, they are too greasy. I like sockeye and are easy to get, kings are harder to catch, too, and we don't have a king net." Other residents of Chignik Lake as well as Chignik Lagoon provided details about how they process Chinook salmon for home use.

Our family, we don't eat many kings; they are too oily. If we get one, we will eat it fresh or freeze it. They are too hard to smoke Sometimes I will take kings we got to Anchorage and have this place [commercial smokehouse] there make lox out of them; that is my favorite way to eat king salmon. (CLK 1)

We get sockeye, kings, and red fish. We put up our sockeye in the early summer if we can before commercial fishing starts. We like to smoke, kipper, jar, and salt those fish. ... Kings come in the summer in July month and if I catch kings on my [commercial fishing] boat ... I bring them home unless I am fishing way outside. Now if there is a closure to the fishery when the kings are in, I like to take my skiff up there and get them out of the [Chignik] river with my hook, you know, fishing pole. ... I freeze my kings whole, guts and all and wait until fall or even sometimes

the next spring to smoke them. ... We don't do anything with our kings until after fishing season, because I just don't have the time and the blow flies are bad then. ... Flies will lay eggs in the fish ... it spoils them if you try to smoke them in the summer. (CLG 1)

We get reds and kings every year if we can. We usually get our kings from our commercial harvests. I freeze my kings whole and wait to smoke them in the fall when I am done with [commercial] fishing and the blow flies have died off. You know those flies will lay eggs in the fish and it destroys the fish. I started freezing them a few years ago because I just don't have time in the summer to smoke fish ... By freezing the fish with the guts and all, it helps prevent freezer burn. It takes a while to get the big block of fish thawed, but they turn out great. If the fall time is too rainy, I sometimes wait until spring to smoke them. (CLG 2)

An elder in Perryville (PVL 2) was asked if he harvested or processed Chinook salmon and he replied, "We eat all fish. I like silvers and chum the best as I grew up eating them the most because they are easy to catch close to our village. But any type of fish we catch we will eat. I was taught to never waste, there is always someone that can eat it."

Respondents discussed how timing and weather contributed significantly to their ability to process Chinook salmon the way they desired. Therefore, as climate change continues to influence these factors, this could directly affect the local harvest, processing, and use patterns and participation in the future.

OBSERVED CHANGES TO SALMON RUN AND CONDITION

Survey Data from 2014–2016: Changes in Salmon Abundance, Quality, and Behavior

Households in all study communities that harvested or attempted to harvest salmon were asked to comment if they noticed any changes or irregularities with the fish they harvested, including changes in the abundance, quality (i.e., condition, appearance, size), and run behavior of salmon. Fishing households were asked to comment separately about early-run and late-run sockeye³ salmon, Chinook salmon, and other salmon (coho, pink, and chum salmon combined). Note that fishers of any of the three species composing the other salmon resource were asked to comment on any observed changes, but respondents were not asked to specify to which species they were referring. Assessment summaries for other salmon are not likely reflective of all three species. In spite of that, because in every study community coho salmon are more commonly harvested than pink and chum salmon, the assessments of other salmon are more likely representative of coho salmon rather than pink or chum salmon, but not entirely.

In this section, a series of tables show results, by study year, for the survey questions that asked fishing and harvesting households about salmon observations (see tables 5-1 through 5-9). Each table shows the results for Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville combined.

Salmon Other Than Chinook

Abundance

2014

Fifty-six households in the study communities harvested or attempted to harvest sockeye salmon and, of these, 48 households (86%) reported that they observed a change in the abundance of sockeye salmon in the areas within the CMA where they fished in 2014 (Table 5-1). A total of 40 households (83%) said that sockeye salmon were less abundant in 2014 than in previous years, 5 households (10%) said sockeye salmon were more abundant, and 3 households (6%) did not provide a characterization of the observed change. As for the other salmon species combined, 59 households harvested or tried to harvest one or more of these species of salmon, and 33 of these households (56%) noticed a change in abundance from recent

3. Note that for 2014, the observation questions asked about sockeye salmon but did not ask respondents to provide separate observation responses for early-run and late-run sockeye salmon.

previous years. Of 33 households, 18 (55%) said at least one species was less abundant, and the remaining 15 households (46%) said other salmon were more abundant in 2014.

2015

Sixty-seven households harvested or attempted to harvest sockeye salmon in 2015 (Table 5-2). Thirty-seven households (55%) reported a change in the abundance of sockeye salmon from the early or first run. Most households (62%) said that early-run sockeye salmon were less abundant, three households (8%) thought the resource was more abundant, but a higher proportion (11 households; 30%) did not provide an assessment of the nature of the change. There were 35 households (52%) that reported changes in salmon abundance from the second or late run of sockeye salmon in the areas within the CMA where they fished: 8 households (23%) said this resource was less abundant, 20 (57%) said this resource was more abundant, and 7 (20%) did not provide any further assessment. There were 73 households that harvested or attempted to harvest one or more other salmon species combined in 2015. Eighteen of these households (25%) noticed that there was a change in the abundance of one or more of these species in the areas where they fished. Of these 18 households, about one-half (56%) said at least one species was more abundant, six households (33%) said at least one species was less abundant, and two households (11%) did not indicate what type of change in abundance was observed in 2015.

2016

In 2016, just as in 2015, a total of 67 households harvested or attempted to harvest sockeye salmon but fewer households reported a change in salmon abundance in 2016 than did so in 2015 (Table 5-3; Table 5-2). In 2016, fewer than one-half of fishing households (29 households; 43%) reported a change in the abundance of sockeye salmon from the early or first run; but, most (24 households; 83%) said that early-run sockeye salmon were less abundant. An additional two households (7%) thought this resource was more abundant and three (10%) did not comment further. There were 24 households (36%) that reported changes in salmon abundance from the second or late run in the areas within the CMA where they fished. There were 19 households (79%) that said this resource was less abundant in 2016; this was opposite of the proportion of fishing households that in 2015 thought late-run sockeye salmon abundance was decreased, which was only 23% of households. Also, three households (13%) thought late-run sockeye salmon were more abundant in 2016; in comparison, 57% of 2015 fishing households assessed late-run sockeye salmon abundance was higher. There were two households (8%) that did not indicate what type of change in abundance was observed. There were 71 households that harvested or attempted to harvest one or more other salmon species in 2016, and 28 (39%) of these households noticed that there was a change in the abundance of one or more of these species in the areas where they fished. Of these, most households (25; 89%) said at least one species was less abundant; also, one household (4%) said the other salmon resource was more abundant.

Table 5-1.—Observed changes in salmon run abundance, Chinook, sockeye, and other salmon, study communities, 2014.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting change in salmon abundance	Species less abundant		Species more abundant		Type of change not indicated	
			Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	28	25	12	48.0%	10	40.0%	3	12.0%
Sockeye salmon	56	48	40	83.3%	5	10.4%	3	6.3%
Other salmon	59	33	18	54.5%	15	45.5%	0	0.0%

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

Table 5-2.—Observed changes in salmon run abundance, Chinook, sockeye, and other salmon, study communities, 2015.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting change in salmon abundance	Species less abundant		Species more abundant		Type of change not indicated	
			Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	27	12	6	50.0%	4	33.3%	2	16.7%
Sockeye salmon—early run	67	37	23	62.2%	3	8.1%	11	29.7%
Sockeye salmon—late run	67	35	8	22.9%	20	57.1%	7	20.0%
Other salmon	73	18	6	33.3%	10	55.6%	2	11.1%

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

Table 5-3.—Observed changes in salmon run abundance, Chinook, sockeye, and other salmon, study communities, 2016.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting change in salmon abundance	Species less abundant		Species more abundant		Type of change not indicated	
			Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	25	7	6	85.7%	1	14.3%	0	0.0%
Sockeye salmon—early run	67	29	24	82.8%	2	6.9%	3	10.3%
Sockeye salmon—late run	67	24	19	79.2%	3	12.5%	2	8.3%
Other salmon	71	28	25	89.3%	1	3.6%	2	7.1%

Source ADF&G Division of Subsistence household surveys, 2017.

Salmon Quality

2014

In 2014, there were 56 households in the study communities combined that harvested or attempted to harvest sockeye salmon and 30 households (54%) reported that they observed changes in the quality of sockeye salmon that they harvested in 2014 (Table 5-4). Households that noticed a change in quality were asked to describe what changes they observed. Most respondents, or 18 households (60%), observed smaller-size fish. Respondents also provided the following observations: four (13%) said fish looked diseased; two (7%) said meat was mushy; one (3%) said fish appeared to be hatchery fish; one (3%) said fish were immature; one (3%) said fish were larger in size; and three (10%) provided other or unspecified quality changes. As for other salmon, 59 households harvested or tried to harvest one or more of the species composing this resource and 10 (17%) of these households noticed a change in the quality from recent previous years. Changes they observed included: six respondents (60%) saw smaller-size fish; three respondents (30%) observed larger-size fish; one respondent (10%) observed diseased fish; and one (10%) did not indicate the nature of quality changes.

2015

In 2015, there were 67 households in the study communities combined that harvested or attempted to harvest sockeye salmon from the early run, and 49 (73%) of these households reported that they observed changes in the quality of sockeye salmon that they harvested from the first run in 2015 (Table 5-5). The most noticed change reported by these households was smaller-size fish, which was indicated by 39 households (80%). Also, six households (12%) noted fish were diseased; four (8%) said fish were immature; two (4%) saw fish that were watermarked or had spots; two (4%) said early-run sockeye salmon looked like hatchery fish; four (8%) provided other or unspecified comments; and two respondents (4%) did not indicate the type of quality change. There were 32 households (48%) that reported a change in salmon quality for late-run sockeye salmon in 2015. Households that noticed a change in quality were asked to describe what changes they observed, and, similar to early-run sockeye salmon, most respondents (17 households; 53%) observed smaller-size fish. Four households (13%) observed larger-size fish, six (19%) thought fish were diseased, two (6%) saw watermarks or spots on fish, and five (16%) provided other or unspecified observations. As for other salmon, 73 households harvested or tried to harvest one or more of the three salmon species composing this resource and relatively few (14 households; 19%) noticed a change in the quality of at least one species compared to fish harvested in recent previous years. The change most households (11; 79%) observed was smaller-size fish. One household (7%) observed diseased fish, one (7%) indicated other or unspecified quality changes, and one (7%) did not indicate the type of change observed.

2016

As was surveyed in 2015, in 2016 there were 67 households that harvested or attempted to harvest sockeye salmon from both the early and late run; however, fewer households reported some changes in the quality of salmon in 2016 than did so for the 2015 study year (Table 5-6; Table 5-5). Thirty-nine households (58%) that fished for early-run sockeye salmon in 2016 reported a change in the quality of salmon with most, 29 households (74%), having reported fish were smaller. Additionally, six households (15%) said fish were larger, two (5%) saw diseased fish, one (3%) said harvests looked like hatchery fish, and three (8%) provided other or unspecified quality changes. Of the 67 households that harvested or attempted to harvest late-run sockeye salmon in 2016, there were 22 households (33%) that reported that they observed some changes in the quality of fish. Smaller-size fish was indicated by eight households (36%), which was the change indicated more so than any other; but, two households (9%) observed larger-size fish. Also, four respondents (18%) observed diseased fish, two (9%) observed salmon that was watermarked or had spots, one (5%) said salmon looked like hatchery fish, and five (23%) had other or unspecified observations. There were 71 households that harvested or tried to harvest one or more of the species of salmon for which results were grouped and 12 (17%) of these households noticed a change in the quality compared to fish harvested from recent previous years. The majority, seven households (58%), observed larger-size fish. Three respondents (25%) observed smaller-size fish, one (8%) saw salmon watermarked or having spots, one (8%) observed meat was mushy, and one (8%) provided another or unspecified quality change.

Table 5-4.—Observed changes in salmon quality, Chinook, sockeye, and other salmon, study communities, 2014.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon quality	Smaller size of fish		Larger size of fish		Watermarked/ spots		Immature		Looked like hatchery fish	
			Number		Percentage		Number		Percentage		Number	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	28	13	8	61.5%	0	0.0%	0	0.0%	1	7.7%	0	0.0%
Sockeye salmon	56	30	18	60.0%	1	3.3%	0	0.0%	1	3.3%	1	3.3%
Other salmon	59	10	6	60.0%	3	30.0%	0	0.0%	0	0.0%	0	0.0%

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Table 5-4.—Continued.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon quality	Diseased		Meat mushy		Other		Type of change not indicated	
			Number		Percentage		Number		Percentage	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	28	13	1	7.7%	2	15.4%	4	30.8%	0.0	0.0%
Sockeye salmon	56	30	4	13.3%	2	6.7%	3	10.0%	3.0	10.0%
Other salmon	59	10	1	10.0%	0	0.0%	0	0.0%	1.0	10.0%

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

Note Households may provide more than one response to the question, so the percentages may sum to more than 100%.

Table 5-5.—Observed changes in salmon quality, Chinook, sockeye, and other salmon, study communities, 2015.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon quality	Smaller size of fish		Larger size of fish		Watermarked/ spots		Immature		Looked like hatchery fish	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	27	11	6	54.5%	2	18.2%	0	0.0%	0	0.0%	3	27.3%
Sockeye salmon—early run	67	49	39	79.6%	0	0.0%	2	4.1%	4	8.2%	2	4.1%
Sockeye salmon—late run	67	32	17	53.1%	4	12.5%	2	6.3%	0	0.0%	0	0.0%
Other salmon	73	14	11	78.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 5-5.—Continued.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon quality	Diseased		Meat mushy		Other		Type of change not indicated	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	27	11	0	0.0%	0	0.0%	2	18.2%	2.0	18.2%
Sockeye salmon—early run	67	49	6	12.2%	0	0.0%	4	8.2%	2.0	4.1%
Sockeye salmon—late run	67	32	6	18.8%	0	0.0%	5	15.6%	2.0	6.3%
Other salmon	73	14	1	7.1%	0	0.0%	1	7.1%	1.0	7.1%

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

Note Households may provide more than one response to the question, so the percentages may sum to more than 100%.

Table 5-6.—Observed changes in salmon quality, Chinook, sockeye, and other salmon, study communities, 2016.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon quality	Smaller size of fish		Larger size of fish		Watermarked/ spots		Immature		Looked like hatchery fish	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	25	5	4	80.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	67	39	29	74.4%	6	15.4%	0	0.0%	0	0.0%	1	2.6%
Sockeye salmon—late run	67	22	8	36.4%	2	9.1%	2	9.1%	0	0.0%	1	4.5%
Other salmon	71	12	3	25.0%	7	58.3%	1	8.3%	0	0.0%	0	0.0%

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Table 5-6.—Continued.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon quality	Diseased		Meat mushy		Other		Type of change not indicated	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	25	5	0	0.0%	1	20.0%	0	0.0%	0.0	0.0%
Sockeye salmon—early run	67	39	2	5.1%	0	0.0%	3	7.7%	0.0	0.0%
Sockeye salmon—late run	67	22	4	18.2%	0	0.0%	5	22.7%	1.0	4.5%
Other salmon	71	12	0	0.0%	1	8.3%	1	8.3%	0.0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

Note Households may provide more than one response to the question, so the percentages may sum to more than 100%.

Run Behavior

2014

Fifty-six households in all the study communities combined harvested or attempted to harvest sockeye salmon and 32 (57%) reported that they observed a change in the behavior of sockeye salmon in 2014 compared to sockeye salmon runs observed for about the previous five years (Table 5-7). In characterizing change to sockeye salmon, most respondents (25 households; 78%) indicated late run timing, six (19%) thought behavior changes were related to weather, two (6%) found fish in different locations than normal, one (3%) said run timing was early, one (3%) indicated the early and late runs were grouped together, one (3%) provided another or unspecified observation, and four (13%) did not comment on a specific behavioral change. Fifty-nine households reported harvesting or attempting to harvest one or more of the other grouped salmon species in 2014. Only two (3%) of these households noted a change in salmon behavior: one household indicated the run for at least one species was early and one household found other salmon in different locations than usual.

2015

In 2015, out of 67 households in the study communities combined that harvested or attempted to harvest sockeye salmon, 35 households (52%) reported having observed a change in the behavior of first-run sockeye salmon and most (24 respondents; 69%) said the run came in late (Table 5-8). Also, five respondents (14%) said the run timing was early, one (3%) indicated the run was sporadic, one (3%) thought that the early and late runs were grouped, one (3%) thought behavior changes were weather related, two (6%) provided other or unspecified observations, and three (9%) did not provide a response to specify the change observed. Twenty-seven households (40%) noticed changes in the behavior of the late run of sockeye salmon. Most households (17; 63%) said the timing of the run was late; also, two (7%) said the timing of the late run was early, two (7%) said fish were in different locations than usual, three (11%) noted weather was related to behavior changes, and four (15%) provided other or unspecified behavior change observations. Of 73 households that harvested or fished for one or more of the species coho, chum, and pink salmon, nine households (12%) reported changes in the behavior of at least one of these species. Behavior changes reported included that run timing was late (four households; 44%), run timing was early (two households; 22%), and three households (33%) did not specify the observed behavior change.

2016

In 2016, there were 67 households in all study communities combined that harvested or attempted to harvest sockeye salmon and change observations were reported by 22 households (33%) for the early run and by 16 households (24%) for the late run (Table 5-9). Regarding the early run, eight households (36%) said the run was early, seven (32%) said the run was late, three (14%) indicated fish were found in different locations than usual, two (9%) provided other or unspecified behavior observations, and two (9%) did not provide a response for the change observed. Regarding the late run, five households (31%) said the run was late, five (31%) found fish in different locations than normal, two (13%) said the run was early, two (13%) indicated changes in behavior were related to weather, one (6%) said the run was sporadic, and three (19%) provided other observations to changes in the behavior of late-run sockeye salmon in 2016. Of 71 households that harvested or fished for at least one of the species that, combined, composed other salmon, 13 households (18%) reported changes in the behavior of one or more of these species. Specific behavior changes reported included: run timing was late (six responses; 46%), run timing was early (two responses; 15%), and that fish were found in different locations than normal (two responses; 15%).

Table 5-7.—Observed changes in salmon behavior, Chinook, sockeye, and other salmon, study communities, 2014.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon behavior	Early run		Late run		Sporadic run		Grouped run		Fish swimming deeply	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	28	3	0	0.0%	1	33.3%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon	56	32	1	3.1%	25	78.1%	0	0.0%	1	3.1%	0	0.0%
Other salmon	59	2	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

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Table 5-7.—Continued.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon behavior	Different location		Changes are weather related		Other		Type of change not indicated	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	28	3	1	33.3%	0	0.0%	1	33.3%	0	0.0%
Sockeye salmon	56	32	2	6.3%	6	18.8%	1	3.1%	4	12.5%
Other salmon	59	2	1	50.0%	0	0.0%	0	0.0%	0	0.0%

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

Note Households may provide more than one response to the question, so the percentages may sum to more than 100%.

Table 5-8.—Observed changes in salmon behavior, Chinook, sockeye, and other salmon, study communities, 2015.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon behavior	Early run		Late run		Sporadic run		Grouped run		Fish swimming deeply	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	27	7	4	57.1%	1	14.3%	1	14.3%	0	0.0%	0	0.0%
Sockeye salmon—early run	67	35	5	14.3%	24	68.6%	1	2.9%	1	2.9%	0	0.0%
Sockeye salmon—late run	67	27	2	7.4%	17	63.0%	0	0.0%	0	0.0%	0	0.0%
Other salmon	73	9	2	22.2%	4	44.4%	0	0.0%	0	0.0%	0	0.0%

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Table 5-8.—Continued.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon behavior	Different location		Changes are weather related		Other		Type of change not indicated	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	27	7	0	0.0%	0	0.0%	0	0.0%	1	14.3%
Sockeye salmon—early run	67	35	0	0.0%	1	2.9%	2	5.7%	3	8.6%
Sockeye salmon—late run	67	27	2	7.4%	3	11.1%	4	14.8%	2	7.4%
Other salmon	73	9	0	0.0%	0	0.0%	0	0.0%	3	33.3%

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

Note Households may provide more than one response to the question, so the percentages may sum to more than 100%.

Table 5-9.—Observed changes in salmon behavior, Chinook, sockeye, and other salmon, study communities, 2016.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon behavior	Early run		Late run		Sporadic run		Grouped run		Fish swimming deeply	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	25	5	1	20.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—early run	67	22	8	36.4%	7	31.8%	0	0.0%	0	0.0%	0	0.0%
Sockeye salmon—late run	67	16	2	12.5%	5	31.3%	1	6.3%	0	0.0%	0	0.0%
Other salmon	71	13	2	15.4%	6	46.2%	0	0.0%	1	7.7%	0	0.0%

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Table 5-9.—Continued.

Resource	Households harvesting, or attempting to harvest, salmon	Households reporting a change in salmon behavior	Different location		Changes are weather related		Other		Type of change not indicated	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Chinook salmon	25	5	1	20.0%	0	0.0%	0	0.0%	2	40.0%
Sockeye salmon—early run	67	22	3	13.6%	0	0.0%	2	9.1%	2	9.1%
Sockeye salmon—late run	67	16	5	31.3%	2	12.5%	3	18.8%	0	0.0%
Other salmon	71	13	2	15.4%	0	0.0%	2	15.4%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2017.

Note Households may provide more than one response to the question, so the percentages may sum to more than 100%.

Chinook Salmon

Abundance

2014–2016

There were 28 households that harvested or attempted to harvest Chinook salmon in 2014, of which 25 households (89%) reported a change in the abundance of Chinook salmon in the areas they fished in 2014 (Table 5-1). There were 12 households (48%) that said Chinook salmon were less abundant, 10 (40%) said the species was more abundant, and 3 (12%) said there was no change or did not comment. Out of 27 households that harvested or attempted to harvest Chinook salmon in 2015, there were 12 (44%) that noticed a change in the abundance of this resource (Table 5-2). One-half (six) of these households said that Chinook salmon were less abundant compared to recent years, four (33%) said the species was more abundant, and two (17%) did not provide an assessment that described the change in abundance. For 2016, out of 25 households there were seven (28%) that reported a change in the abundance of Chinook salmon compared to recent prior years: six (86%) said that Chinook salmon were less abundant in 2016 and only one (14%) thought the species was more abundant (Table 5-3). For all study years combined, data collected from harvesting and fishing households regarding Chinook salmon abundance indicate that most households (54%) that reported a change to run abundance observed fewer Chinook salmon returning. This finding is complemented by comments from community members that are noted later in this chapter's section "Key Respondent Data."

Salmon Quality

2014–2016

Out of 28 households that harvested or attempted to harvest Chinook salmon in 2014, 13 (46%) reported a change in the quality compared to the previous five years (Table 5-4). Those households that noticed changes provided the following observations: eight (62%) observed smaller-size fish; two (15%) indicated meat was mushy; one (8%) said fish were immature; one (8%) said fish were diseased; and four (31%) provided other or unspecified characterizations. In 2015, out of 27 households, there were 11 (41%) that reported a change in Chinook salmon quality compared to fish harvested in the previous five years (Table 5-5). Those respondents who noticed changes provided the following observations: six (55%) saw smaller-size fish, two (18%) observed larger-size fish, three (27%) said Chinook salmon harvested looked like hatchery fish, and two respondents (18%) provided other or unspecified quality changes. There were 25 households that harvested or attempted to harvest Chinook salmon in 2016 and five households (20%) reported a change in the quality of fish harvested compared to those harvested from about the previous five years (Table 5-6). Mostly, the change observed by these households was smaller-size fish (four respondents; 80%); also, one (20%) said the meat was mushy. For all study years combined, data collected from harvesting and fishing households regarding Chinook salmon quality show that most (62%) respondents who saw a change during the three study years saw a decrease in the size of the fish returning. This finding is complemented by comments from community members that are noted later in this chapter's section "Key Respondent Data."

Run Behavior

2014–2016

There were 28 households that harvested or attempted to harvest Chinook salmon and few households (three; 11%) reported that they noticed a change in the behavior of this species in 2014 compared to about the previous five years or so (Table 5-7). Behavior changes reported were as follows: one (3%) household said the run was late, one (3%) found Chinook salmon in different locations than normal, and one (3%) cited some other or unspecified observation. For 2015, out of 27 households there were seven (26%) that reported a change in the behavior of Chinook salmon (Table 5-8). Of those seven households, four (57%) stated that the run was earlier than normal, one (14%) said the run was later than normal, one (14%) said the run was sporadic, and one (14%) did not indicate details about change. Out of 25 households that harvested

or attempted to harvest Chinook salmon in 2016, five (20%) reported a change in the behavior of these fish but only three behavior change descriptions, each garnering one response (20%), were provided: the run was early, the run was late, and Chinook salmon were found in different locations than normal (Table 5-9). These data do not appear to give much insight overall; however, each year respondents did report some change in Chinook salmon behavior. The most notable result is that, in 2015, more than 50% of respondents who said there was a change observed that the run was earlier than normal (Table 5-8). This run timing characterization for Chinook salmon is similar to the comments provided by key respondents, which will be presented in the next section of this chapter.

Key Respondent Data

Like the responses collected from the household postseason surveys, key respondents expressed concern about the declining early- and late-run sockeye salmon abundance, particularly in the years 2015 and 2016. Respondents generally mentioned that the sockeye salmon decline was occurring alongside the Chinook salmon decline.

Observed Changes to Chinook Salmon Run Strength and Timing

Respondents' observations about declining Chinook salmon runs are consistent with ADF&G's escapement estimates through the Chignik River weir, noting that Chinook salmon returns to the Chignik watershed have been declining since 2005 (Wilburn and Stumpf 2017:33, 81). Study respondents concurred that Chinook salmon populations returning annually to spawn in the Chignik River were reliable and plentiful in the 1980s–2000 but noted that during the last 15 years they have seen notable declines in returns and for much longer than ADF&G's escapement estimates indicate. In 2014, interviewed subsistence users noticed a stronger return of Chinook salmon to the Chignik River as well as off the beach lining the community of Perryville. Many households with commercial fishermen noted more Chinook salmon were caught in 2014 than had been remembered in recent years. ADF&G reported the amount of Chinook salmon harvested in 2014 was well above previous historical averages (Wilburn et al. 2015:8, 32). Conversely, escapement was below the 5- and 10-year, but above the historical 20-year, escapement averages (Wilburn et al. 2015:6). The experience in 2014, however, appeared to be an anomaly because, in 2015 and 2016, respondents noted considerable declines to the number of Chinook salmon harvested by commercial fishers, as well as a notable lack of returning fish to spawn in the Chignik River. ADF&G's assessment differed: the 2015 and 2016 estimated commercial harvests of Chinook salmon were above all historical averages, yet Chinook salmon estimated escapements in both years were below historical averages (Wilburn and Stumpf 2016:7, 9, 37; 2017:11, 13, 45).

Many respondents mentioned climate change as a factor affecting salmon and other wild resource species. Respondents talked of warmer ocean temperatures causing changes in the behavior and condition of Chinook salmon, as well as other subsistence resources. They attributed the occurrence of Chinook salmon never entering fresh water, or entering it late, to warmer water temperatures. Temperature change affecting the behavior and availability of Chinook salmon feed was also mentioned. Residents made statements in interviews and during household surveys about their observations and concerns about inadequate Chinook salmon escapements.

Fish and Game manage sockeye and kings on low end of escapement goals, kings haven't met low end in years. (CLG 4)

We get red kings but lately seeing more white kings. I remember we use to get 25,000 kings [1985/1986] through this river, now can't even get 2,000. (CLG 6)

Lately, Fish and Game makes us throw our fish out of the boat if we catch them, because the Chinook escapement is so low. (CLG 8)

We didn't get enough kings [for subsistence] last year [2013], didn't go out enough, and didn't catch enough in commercial fishery. (CLG 2)

... one of the things that we are learning sort of painfully is that the fish are confused by the changing environment out at the ocean throughout their life cycle. (CHG 2)

Salmon runs ... arriving later or irregular, some salmon returning a year early, spawn is immature, fish dive deeper to stay cool, some don't go up the river at all. (CLG 9)

Many respondents cited climate change as a factor that is contributing toward the decline of Chinook salmon to the CMA.

Fish are getting smaller with warmer water. My dad used to say, "Little fish like warm water, big fish like cold water; and if rivers are too cold fish won't go up to spawn, and if too warm many don't either." (CLG 9)

Climate change, and warm weather making rivers and oceans warmer, and I believe these factors must have an effect on the salmon returning, also kings. There are estimates that salmon are not staying out in the ocean as many years as normal and returning early to the rivers to spawn, and the sockeye are much smaller, and more jacks returning than females. Maybe there is no food out there for them to eat. Kings I have not noticed changes in how they looked, but in 2014 we had a bunch of kings come back, and they were large. (CLK 12)

Water temperature, bugs, temperature. So, we had a lot more opportunity than we took advantage of simply because we figured out very early on, that every attempt we did we had to cut short because we could see that we weren't going to be able to get dry fish without it rotting, or we weren't going to be able to get a three-day smoke. We had to pull it the second day because of bug infestation, or we weren't even to put it in the smokehouse. We were going to have to freeze it, because it was edible for like soups and chowders but not for something that we could smoke or kipper. (CHG 1)

I have never seen the ocean as warm as it has been and lately some winters lately even Chignik Lake didn't freeze, you could take a skiff all the way from the lake to the lagoon all winter. ... The high temperature in the water ... yes, both in fresh water and salt water has to be affecting the salmon. (CLK 4)

You know that nuclear spill [Fukushima, 2011] in Japan a few years ago, it went into the ocean. We get lots of trash from Japan on our beaches. I worry it is harming our salmon and other fish. Do you know if there is anyone out there studying this? (PVL 1)

I heard a lot of complaints about the water being so warm [in 2014], and it was, too. I noticed it too, really warm water this year, really warm compared to before. We were fishing a couple times and it was over 90 degrees ... We were fishing in the west, on the other side ... I went, three or four days in a row there, [fish] just getting cooked. (CLK 2)

I think temperature of ocean had issue this year 2014 with salmon, halibut. (CHG 1)

The "blob," warm ocean spot in the Pacific Ocean everything is messing up out there. This is affecting of the kings, reds, other fish, birds [] kings are not feeding necessarily when in life cycle is where reds are feeding. We are seeing lots of dead birds, murrelets mostly around here last few years, and we had a bunch of dead cod wash up here and in Chignik last winter. There must not be enough food out there. (PVL 1)

Respondents from Chignik Bay also commented during interviews about notable climate change observations they had observed.

There has been a tremendous change and it's actually been over the last 30 years because there were changes that were going on 30 or 40 years ago that nobody

recognized as climate change. But, yet, now, in retrospect, this pattern goes beyond 10 or 20 years. So, it has changed everything from what is available and what is not. (CHG 2)

Like that glacier up there, you can hardly see it anymore. (CHG 1)

We have had four years of warmer-than-normal temperatures, the current winter is not as cold as it used to be 25 or 30 years ago Real clear example is we have a lake out at the airport that is fresh water and we had four years in a row that lake never froze over completely. ... Typically over the last 35 years every single year that lake would freeze to an ice depth of 10 to 12 inches at the peak and we ice skated, we ice fished, we took our vehicles, trucks, vans out on the lake. So pretty dramatic change and so this is the, out of the last five years this year is the first year that the lake has frozen solid, stayed frozen and got any kind of ice depth on it. (CHG 2)

After being asked about the time of year that “feeder king salmon” are harvested, the same Chignik Bay resident described when and where this resource is found.

It’s actually all winter long. The only period that it really slows down, and it’s varied now because of weather, but the only time that it really slowed down this year [2017] is mid-January to the present, mid-February. And the reason is because the water temperature has decreased and the feed fish have moved out towards the outer limits of the greater Chignik Bay, which, Chignik Bay is, a lot of people think this area out here in front of us is Chignik Bay. It’s not. It’s Anchorage Bay. ... And I know right now that the kings are in Castle Bay. But that’s a dangerous trip to make in January and February to go looking for these feeder kings. ... So we saw them [Chinook salmon] in the fall, but when the feed moved out with the cold temperatures around the first week of January, the seagull population dramatically started to disappear which meant that they are feeding out in the warmer bays, but we still were seeing big balls [of feed fish] and activity but it was farther offshore, like in the entrance of the bay.

And then it just diminishes to nothing. This pattern, as the water warms, starting in April, actually, the last five years, it’s started in March and even into February. This year, I would expect that we’ll probably see them [Chinook salmon] in April and that’s what I’m gearing my effort for. (CHG 2)

Observed Changes to Chinook Salmon Condition

Study respondents commonly stated that Chinook salmon that are returning annually in recent years are returning smaller and fewer in numbers.

The Chinook we caught this year on rod and reel and in the gillnet were small. And if you talk to [another local fisherman] he says the same thing, he told me, “When I first came here about 30 years ago, I used to be able to catch 40, 50 pounders on a regular basis,” now he said the biggest fish we are catching are “25 maybe 30 pounders.” And he said he witnessed the same thing that happen in the Kenai, fish, bigger ones get picked out. Sounds like this year they [Kenai] didn’t have much of a fishery huh? (CLG 1)

When I was a kid [now about 70], I use to be able to catch a king in the river every cast, there were lots and they were big fish, like 20 or so pounders. There is hardly any that come up the river anymore. I am not sure why. Last year [2014] we could only keep one king for subsistence, and it was small. I don’t even think it was 10 pounds. (CLK 1)

Another common comment was that Chinook salmon flesh was mushy and that this could be attributed to warmer ocean temperatures. One resident described seeing more “black-nosed” Chinook salmon than before. A few respondents commented that many of the Chinook returning were “white kings,” which they believed to be hatchery-raised fish from British Columbia. Other respondents called them “winter kings” and said that the fish have remained inside Chignik Bay during winter months. Many residents said they did not like the taste of the white king salmon and would not eat them, but they said if they caught the fish commercially that the local processors would buy them.

The ones we catch on the outside are feeder kings that we are taking, and they are not as good of quality for smoking. The ones I used to catch in the river up there or the lagoon were a lot firmer fish. Those ones that we are catching on the outside are growing up and are not quite as firm fleshed. (CLG 1)

I noticed a bunch that were white kings, you know with the black noses, have white meat, not pink, that I understand are from British Columbia hatcheries. ... I don’t like how they taste so I don’t eat them, but the canneries buy them they don’t care. (CLG 9)

Other respondents also commented on white or winter kings, which many noted have been increasing in population in recent years and they believed this change to be due to warmer ocean conditions in the winter, though many locals do not tend to eat white kings.

White kings have black noses and white meat, red kings have red meat. They are distinctly different in oil content and taste. They look about the same. I think that most locals don’t eat the black-nosed kings, they don’t have much taste. (PVL 1)

A Chignik Bay resident described that despite lacking a preference for “white kings,” this resource is still an important food resource option.

People around here typically don’t eat them, white kings, in this community [Chignik Bay] but come February or March when you haven’t had any fresh fish for five or six months people will pretty much try anything. Because of the warmer summers now, I think I will make more efforts to put up winter kings as it is easier to preserve them in the cooler temperatures with smoke. (CHG 2)

A Chignik Lagoon respondent who commercial fishes for salmon commented in 2014 that his crew and other boats fishing in the Central and Eastern districts of the CMA caught an unusually large number of king salmon that he believed were likely hatchery fish.

Here’s another thing that I see happening that really alarms me, is we’re catching a lot more kings on the outside, a lot more! I mean like [name redacted] last summer in Aniakchak, he had, I think, 1,200 pounds of kings caught one day. Unheard of. And I am thinking they are hatchery kings. They are getting released and traveling all over and they are feeding all over and is that competing with the natural fish stocks? I bet it is! It is really complicated. (CLG 1)

This respondent went on to say that other boats caught a lot that year, too.

Last fall, [two names redacted] were talking to [name redacted] and sounded like [name redacted] had 4,000 pounds of kings in one set out there and [name redacted] had like 3,000, but I guess they showed up all at once, and unheard of. The same way with the sport fishery in Kodiak and Homer, they never use to catch kings like that. I don’t know if it is more effort or what? But I am willing to bet it is hatchery kings, they are spreading out in the Gulf of Alaska and we are catching them. (CLG 1)

Another Chignik Lagoon respondent also commented on what he had heard about the unusual, large number of Chinook salmon harvested in fall 2014.

Ahh, that was pretty much continuous. I didn't fish there [Aniakchak] but it was steady [where I fished], but it was all those kings that were out in Aniakchak. [Name redacted] told me they were getting 1,000 pounds a day, and not the little ones, either. They were bigger ones, this big [gestures with hands apart]. They [Chinook salmon] were just going through, there was a lot of herring in the bay [Aniakchak] they were chasing. (CLG 11)

The respondent commented that this was the first year he had heard of or seen so many Chinook salmon in Aniakchak, but other years he has noticed large amounts of Chinook salmon occasionally near Castle Bay.

I have seen a lot off of Jacks Bay Point a few years ago, but that was just one day and then they were gone. They were smaller; the average size then was a lot smaller than this year. Maybe 10 pounder that year and this year 20 pounder, I would say average size. But I don't think that the king runs here are declining. They are making escapement, aren't they? (CLG 11)

Observed Environmental Changes

Salmon, being an anadromous species, are susceptible to habitat changes in both freshwater and saltwater environments. Comments from community members pertained to both saltwater habitat—where Chinook salmon spend a portion of their lifecycle feeding, growing, and maturing—and freshwater habitat, which is key to salmon spawning. Observations and comments about marine or riverine environment changes were grouped and presented below.

Observations of Environmental Changes in Saltwater Habitat

Key respondents stated that the ocean temperature has been rising and this is changing the behavior of many fish, including Chinook salmon. Some respondents expressed concern about the warming marine conditions and “the blob,” a term given by National Oceanic and Atmospheric Administration fishery scientists to a warm ocean spot that was forming in the Gulf of Alaska that caused concern that it could cause harm to fish stocks, particularly salmon.

“The blob” as they are calling it, warm water blob. It was the first time we actually saw a local reaction on the terminal return, having said that what we have been observing is, you know, an interconnecting change out in the Pacific Ocean where the whales are feeding, you know, how much crab eggs are in the water, you know where they are, what time of year they are showing. Everything is mixed up out there. My sense of the king species versus the red species is that confusion is going to affect everything generally but where those kings are feeding in the wintertime or in different parts of their cycle is not where these reds may be, are feeding (CHG 2)

What do you know of “the blob”? ... Salmon out there in the ocean, if the water is too warm for them what will happen? Will they have to eat more to survive, will they starve, will they come back to spawn, I don't know but am very worried. (PVL 1)

Biologists blame the blob [warmer water in Gulf of Alaska] for affecting food sources for king and other salmon. Seabirds are dying all over here, I believe they can't find enough food to eat. The government needs to spend more time studying the environment and how the changes are affecting our salmon runs. (CLG 4)

Respondents also noted an increased amount of “foreign” fish circulating in Chignik Bay, Chignik Lagoon, and the salt water beyond the bay in recent years.

I have fished all my life and I have caught more foreign fish starting in 2011 while commercial fishing in Chignik. I caught a Greenland shark that was full of octopus when we cut it open, a spotted salmon shark, and a Skipjack tuna too. (CLG 1)

The idea of “foreign fish” extended to hatchery fish according to a Perryville respondent (PVL 1), who said to a researcher, “Lately we caught lots of kings that I hear are probably hatchery kings from Canada and these fish must be competing for same food as our native kings.”

Additional comments pointed to climate changes broadly affecting local habitat and resources.

Chignik Bay, my community we have become more dependent on marine resources and less dependent on terrestrial because of the lack of terrestrial opportunity. It is darn tough to find a rabbit around here in Chignik Bay. It is darn tough to find ptarmigan in Chignik Bay, and it wasn’t always like that. (CHG 2)

I think the biggest example I can give you is when we saw the loss of the glaciers. It didn’t happen 10 years ago, it didn’t happen 20 years ago, and they don’t exist anymore, so nobody cares. They started disappearing here 40 years ago. And there were literally, if you go up and down this coast, you couldn’t travel for more than a day without seeing calving glaciers on the Pacific, sometimes six to 10 in a day. Now you cannot find a one and you can travel up and down this coast at eight knots offshore, and never see a calving glacier in the Pacific. There are a few left but you have to divert into the bay to maybe find even the glimpse of one. You can see a glimpse of the top of them, but they are not tidewater anymore. (CHG 2)

Forty years ago when you went halibut fishing in the summertime, you could literally go into Castle Bay, which is four miles from here, and you could chip off ice [from glacier or icebergs] directly into your fish hold, cannery shut down, no ice available. You need ice to commercial fish halibut, and they literally could go into that bay and take ice. (CHG 2)

Ocean currents changed, kings and reds this year came along the beach [by Perryville], they are normally further out. Fish are smaller, fish are fewer, halibut, salmon, candlefish [hooligan] not showing up anymore, animals are smaller, caribou, rabbits ... I don’t know what’s going on, something is happening, no food or something, it’s going to change us, too. (PVL 1)

The flies stay around longer ... all winter now ... and makes it hard to dry fish. Winters have been very rainy, too. We try to adapt and put fish in freezer until we can dry or smoke them but sometimes, they end up freezer burned. (PVL 4)

A Chignik Bay respondent discussed the increased availability of Chinook salmon for harvest during winter.

In the past there were historically, and this may go last 30 years, there would be one net put out around Christmastime that might produce a couple of kings. And then that net would be removed. And it might come back, one net might come back late March and it might produce three or four kings, but there are so many kings now. (CHG 2)

Water temperature and subsequent effects to forage species were characterized as contributing factors.

Last year was unbelievable for sand lances. We, the last two years, on the heels of warmer winters, the production of sand lances in Anchorage Bay was unprecedented. I never have seen the numbers and the spawning activity. We’re assuming spawning activity because you would walk down to the beach on the falling tide, and there’s these little rivulets of water flowing over the top of the sand, and if you looked closely, it was solid tails of sand lances sticking out of the flowing water, and the seagulls were feeding on the sand lances right on the edge of the saltwater and this fresh water that flows over the top— ... so that would be the north, east side of Chignik Bay, would be where they, would, on a falling tide, stay in the sand. This brought foxes that would literally spend the entire day on

the beach. And the foxes' diet was almost 100% sand lances during this period of time. (CHG 2)

The following comments were provided during conversations with household survey participants and key respondents:

There is more algae and grass in the lagoon, and Chignik River and even in the ocean and this makes it harder to fish, clogs the nets. There are also more jellyfish out in the bay and lagoon, too. Water temperatures of ocean and rivers have been very high. (CLG 2)

Lots of things, environmental changes, going on. Water is too warm for the salmon, salmon quality was deplorable, more flies. (CHG 1)

Many kings and reds caught this year with the high temperatures, the flesh has been too soft to process, many were turned into dog food. I doubt these fish were accounted for on the surveys or permits. (CHG 2)

Observations of Environmental Changes in Freshwater Habitat

Residents noted changes in glacial melt and precipitation that led to more flooding of the local riverine systems, which could be affecting Chinook salmon behavior and condition. One interviewee mentioned more alders growing along rivers and discussed the effect that an increase in the number of these plants could have on the river ecosystem and Chinook salmon. Residents also noted that lake levels were changing. Black Lake was said to be getting wider and shallower, in part because beavers were damming the lake systems. Also, rivers were said to not be freezing as they used to.

Last year I put up more fish because I had to send out fish to out-of-town relations. They are here in the summer, but they couldn't get any salmon 'cause the rivers and creeks all flooded. (CLK 9)

The warmer temperatures and the milder winters, and it's obviously going to affect the terrestrial animals, and there's going to be winners and losers in that as well. (CHG 2)

Warmer weather last few years, causing a lot of algae in the water. Kings that were caught above the weir [in 2014], my relations over there at the lake [Chignik Lake] said that they found in their bellies this year that they had been eating their own kind ... usually they are empty before they head upstream. (PVL 1)

Black Lake has been getting more and more shallow and getting wider over last couple of decades. FRI [Fisheries Research Institute] has been studying that lake forever it seems. (CLK 12)

Runoff, water, ice might have a scent for fish, too dry, hot might affect fish. If water is low how can there be any fish? (CLG 6)

Streams are dry, couldn't get up there to spawn, how long does it take to kill off the run? (CLG 5)

Warmer winters, some years less snow and lake and river have not frozen over, this I worry could be killing some of the salmon rearing in the river and lakes. I read somewhere that warmer water can cause salmon to grow faster than normal, as they are not needing to preserve their energy in colder water, this would also I think cause them to eat more, competing with other fish. (PVL 7)

They [Chinook salmon] spawn above and below the weir. They utilize the entire river and the number of kings that return dictates how large of an area they will use. If the return is small, they use a smaller portion of the river. If the return is large, they fill that predestined primary area and then expand both above and

below. So if we go back to the old days, 25 years ago when we were getting 6,000, 8,000, 10,000 kings through the weir we saw them spawning all the way from well below the weir all the way up into Chignik Lake. (CHG 2)

Perceived Causes for Decline of Chinook Salmon

Overview

Respondents were asked to provide their perceptions, observations, and knowledge regarding what is causing the decline of Chinook salmon in the CMA. As described above, most respondents interviewed for study years 2014–2016 noted that Chinook salmon returns to the Chignik River have been slowly declining over the last decade or more, and respondents collectively attributed the decline to factors that include changes to the environment and climate, as discussed above, but also the effects of sport, subsistence, and commercial fisheries and the management of these fisheries over time. This section discusses six primary factors that local residents see as contributing to the Chinook salmon decline: management of home pack of Chinook salmon specifically, state management of commercial salmon fisheries, management of federal commercial fisheries, management of Sport Fisheries Management Region 2, management of subsistence, and other human activities. It should be noted that no one key respondent attributed the salmon decline to just one specific cause.

Recording and Handling of Home Pack

As described earlier in this report, many residents of the study communities are commercial fishermen and the postseason survey for each study year included questions to identify participation in commercial fishing. The three-year average estimated number of households that participated in commercial fishing for each community was 18 in Chignik Lagoon, 15 in Perryville, 12 in Chignik Bay, and 10 in Chignik Lake (Table 5-10). Many residents who commercial fish bring Chinook salmon home from their commercial harvest. Retaining fish for personal use from a lawful commercial catch is legal under 5 AAC 39.010(a). Further, a commercial fisher is required to report any fish retained from a commercial harvest on a fish ticket when fish are delivered to the buyer (5 AAC 39.130(c)(12)). Several commercial fishermen respondents commented that home pack fish are generally not reported. Some reasons given for not reporting home pack include not enough time when delivering fish to the fish tenders, fish tenders not asking about home pack, or fishermen simply forgetting to record home pack. Trident Seafoods offered fishermen free vacuum sealing and freezing of home pack during the study years. One respondent familiar with the cannery said that workers for Trident Seafoods annually must throw out boxes of unclaimed home pack consisting of sockeye and Chinook salmon. Concerns regarding home pack thus include Chinook salmon not being recorded and accounted for during escapement and Chinook salmon being wasted in unclaimed home pack.

The escapement goal for Chinook salmon in the Chignik River is 1,300–2,700 fish (Renick 2020:11). Following 2011, Chinook salmon annual escapement estimates have been at the low end of the escapement goal, and below that goal in 2013, 2017 and 2018 (Renick 2020:70). Though Chinook salmon escapements were met in 2014, 2015 and 2016, the study years, many respondents noted that they had difficulty obtaining Chinook salmon for subsistence. Also, because of low Chinook salmon escapements, ADF&G issued emergency orders to commercial fishermen in the CMA in 2013 that restricted the retention of Chinook salmon.⁴ Of note, similar restrictions continued to be implemented following the study period of this research project.⁵ Some respondents noted they did not get enough Chinook salmon to meet their subsistence needs in years when commercial fishermen could not retain Chinook salmon from their commercial harvest. These respondents said they agree with ADF&G for issuing the non-retention orders

4. A summary of 2013 CMA emergency orders is published in Anderson et al. (2013). The following emergency order numbers applied restrictions in 2013: 4-FS-L-14-13 and 4-FS-L-15-13 (Anderson et al. 2013:69).

5. Summaries of 2017 and 2018 CMA emergency orders are published in Wilburn (2018) and Wilburn and Renick (2018). The following emergency order numbers applied restrictions in 2017 and 2018: 4-FS-L-12-17 and 4-FS-L-SUB-18-1 (Wilburn 2018:85; Wilburn and Renick 2018:72)

Table 5-10.—Estimated household commercial fishing participation, study communities, 2014–2016.

Community	Study year	Sampled households	Estimated households	Estimated household commercial fishing participation		Estimated average household commercial fishing participation, 2014–2016 Number
				Percentage	Number	
Chignik Bay	2014	25	30	32.0%	9.6	12.0
	2015	22	29	40.9%	11.9	
	2016	24	27	54.2%	14.6	
Chignik Lagoon	2014	16	25	75.0%	18.8	18.3
	2015	19	26	73.7%	19.2	
	2016	20	26	65.0%	16.9	
Chignik Lake	2014	19	26	26.3%	6.8	10.4
	2015	28	29	35.7%	10.4	
	2016	28	33	42.9%	14.1	
Perryville	2014	34	39	26.5%	10.3	14.6
	2015	33	39	45.5%	17.7	
	2016	26	37	42.3%	15.7	

Source ADF&G Division of Subsistence household surveys, 2015, 2016, and 2017.

but thought that ADF&G and fishermen needed to do more to protect the Chignik River Chinook salmon runs for fear the runs will continue to decline and possibly die off completely.

We will smoke kings we removed from home pack soon. There is so much pressure on kings because we are commercial fishermen. Home pack ... the fishermen are sometimes failing to record the home pack, it is a shame to sell our kings for \$1.00 per pound and sometimes less when we can keep them for home pack. (CLG 2)

I am a commercial fisherman, and I can tell you that the number of kings kept for home pack is rarely reported on fish tickets. I don't think it is intentional on the part of the fishermen because it is legal to do this, but more so that it is busy when unloading fish, other boats waiting, and the tenderman doesn't always ask. But I have been bothered by this for years as our kings are declining more and more. I think it is a problem that the department needs to be more concerned about and enforce. The cannery will freeze these fish for you if you fish for them, but I know a lot of these fish are never claimed at the end of the season, a guy is in a hurry to leave and doesn't bother. (CLG 1)

Personal use [removal of fish from commercial harvests] reporting especially for kings is gravely underreported. Do you think any of those fish are showing up on your tickets if you do your math, because even though the department might dictate the personal use fish need to be reported I can show you the shipping records from Chignik of exported frozen fish and personally shipped by individuals that is higher than the number of personal use fish, uh, that you are getting reported especially if you take the subsistence out of that ... and the gear product [Chinook salmon caught and sold for commercial harvest] now what you really got is this big unknown. A big unknown of how much fish is going out of here and what the species are. It's not just king salmon it's lingcod, it's yelloweye, it's halibut,

and the thing that angers a lot of people, including myself, is that some of these people don't have the culture of persevering the fish properly, taking care of it properly and what look good to them when they put it into a box; they didn't have time to slime it, they didn't have the time to take care of it, doesn't look so good September 1st when the plane is on its way ... and they want to go home and they just leave it. That disposal process is undocumented and it's not just it goes against the wanton waste policy it goes against the local culture and we are not even given the opportunity to utilize that fish to feed our dogs or to selective out maybe, you know, fish that are not quality to be recycled into the subsistence. (CHG 2)

A Chignik Lake resident (CLG 2), in expressing support for Chinook salmon conservation, said, "I support ADF&G restricting retention of kings from our commercial catches if escapements are low. My family loves kings, but I fear we are on our way to killing off our king run."

Management of Commercial Fisheries: Management Areas Adjacent to CMA

Several respondents, most of whom were commercial fishermen, blamed commercial salmon fisheries from outside the CMA (particularly the Alaska Peninsula Management Area, or Area M) for catching too many sockeye and Chinook salmon that they believed migrate off the coast of the Alaska Peninsula and head for Chignik waters. Area M is considered an intercept fishery because there are not any terminal streams in the area where sockeye salmon spawn. They overwhelmingly would like to see ADF&G managers and the Alaska Board of Fisheries (BOF) limit the amount of all salmon species harvested in the southern Alaska Peninsula by Area M commercial fishermen. Statements from a Chignik Lake respondent were illustrative about these issues:

Lots of things are causing our king salmon runs to crash, but one thing they are getting killed off by Area M fishermen are catching the crap out of them. They are an intercept fishery, and they are killing off our sockeye run too. (CLK 2)

The board [Board of Fisheries] is supposed to protect fisheries, but they have failed Chignik, they are in the pocket of who gives them money. They always favor Area M. Fish and Game also seems to favor Area M, and our local managers I give them credit, but I think their hands are tied with Kodiak management, they can't do much to help us. And Fish and Game doesn't have managers that stay here long anymore. When we had long-term managers like [identities were removed] and we had stronger sockeye and much larger king runs and the local people felt as if they were being heard and included. (CLK 2)

Management of Federal Commercial Fisheries

Commercial fisheries in the waters that surround Alaska occur in the federally managed waters ranging 3–200 miles offshore and are governed by the Magnuson-Stevens Fishery Conservation and Management Act (MSA).⁶ In Alaska, the North Pacific Fishery Management Council manages the marine fishery resources. Commercial fisheries in the federally managed waters of the Gulf of Alaska and Bering Sea harvest some of the highest volumes of groundfish, such as pollock and cod, in the country, which produces

6. North Pacific Fishery Management Council, "U.S. Regional Fishery Management Councils: Conserving and Managing the Fisheries of the United States," https://static1.squarespace.com/static/56c65ea3f2b77e3a78d3441e/t/5cf1278e56b127000143cc1f/1559308177721/2019-05-15_RFMC-Overview_UPDATED_FINAL.pdf (accessed December 2020).

bycatch of other fish.⁷ Chinook salmon and Pacific halibut are taken as prohibited species catch in the Gulf of Alaska groundfish trawl fisheries, although a certain amount is allowed as bycatch.⁸

Several respondents voiced concern about Chinook salmon caught in the large factory trawlers that are targeting pollock in the Gulf of Alaska and the Bering Sea. One respondent spoke of seeing bycatch data published online by the National Marine Fisheries Service bycatch observer program, and the North Pacific Management Council, and believe that these fisheries are a major cause for the decline of Chinook salmon statewide.

Those large factory trawlers or draggers for pollock in Gulf of Alaska and Bering Sea are catching huge amounts of king salmon as bycatch. It is [expletive removed] ridiculous how they get away with that. Like, I have heard draggers of Bering Sea bycatch are allowed 60,000 pounds of king salmon bycatch before they get penalized. I spoke with a person that worked on one of those draggers for pollock, and he noted the number of kings and sockeye salmon caught as bycatch. People on the boat told him not to report all the king and sockeye bycatch, but he told them he had to. He showed me the bycatch reports from the dragger he was on. Yeah, you can look this up yourself, see how many kings and halibut and other fish are caught by those draggers. They have to throw the fish overboard, too, what a waste. This is total [expletive]. Here, people that rely on those kings for food, especially there in the Yukon, can't even catch enough kings to eat or they aren't allowed to catch any at all while these big boats are allowed to catch and kill that many. It is fricking politics, rich lawyers back them and the North Pacific Management Council allows this. Money wins over protecting our resources. (CLK 12)

This same respondent in Chignik Lake, when asked why he thinks Chinook salmon runs to Chignik are declining, responded based on his knowledge.

You want to know what is causing our king runs to die? Just look on your computer on the federal fisheries council's [North Pacific Fishery Management Council] website. You can see how many kings are caught by them pollock draggers every year. Those big factory trawlers are not supposed to catch king salmon, yet they are allowed some 60,000 kings to be caught without getting their hands slapped. Then they can't sell them or even give them away to communities that could use them, so they just have to throw them overboard, what a waste. Then ADF&G wonders what happened to our king run, what happened to all of Alaska's king runs. (CLK 12)

Management of Commercial Salmon Fisheries: CMA

Many study respondents thought that the escapement goals for Chinook salmon and sockeye salmon were too low. Frustrations were universally associated with the perception that escapement for both species was once managed on the high end of the escapement goal but is now managed on the lower end of the escapement goal. Many respondents understand that biologists believe the lakes can rear only so many fish and if there are too many it could have adverse effects on the mortality of rearing salmon. However, older respondents remember there were huge escapements of both Chinook and sockeye salmon into the Chignik River watershed in the past and, in their view, no negative consequence came to the size of future runs. One Chignik Lagoon respondent (CLG 8) discussed his belief that the management of the sockeye salmon since the 1980s gradually changed the run timing of Chinook salmon due to the heavy influence of commercial fishing activity occurring during particular times during both sockeye salmon runs. Another respondent

7. Sea Grant Alaska, "Fisheries: Alaska fisheries are critical to its livelihood," University of Alaska Fairbanks, <https://alaskaseagrant.org/our-work/fisheries/> (accessed December 2020).

8. North Pacific Fishery Management Council, "GOA [Gulf of Alaska] Trawl Bycatch Management," <https://www.npfmc.org/goa-trawl-bycatch-management/> (accessed December 2020).

(CLG 10) believed that the management of the sockeye salmon runs altered the Chinook salmon return behavior.

Most respondents voiced distrust of ADF&G's escapement count, which involves counting fish through the weir for 10 minutes once every hour (Renick 2020:7). Though most of the concern by respondents was regarding sockeye salmon escapement counts, a couple of respondents also thought that Chinook salmon were undercounted. Much of their reason for distrust stems from local observations of fish (sockeye salmon) in the spawning creeks of Clark River and Alec River, and in Black Lake during the fall and winter of the study years. Residents who went up to the spawning creeks by skiff could not see comparable numbers of salmon as they had seen a decade or more before.

Fish and Game tells us that they always meet escapement [for sockeye] but last few years we locals just are not seeing the number of fish up there that should be if Fish and Game's numbers are what they say they are. Lots of locals here don't trust their counting every 10 minutes on the hour. I know they have that camera, but the numbers they are reporting and what we locals see just doesn't match up. I am afraid our sockeye runs will get killed off like what is happening to our kings. (CLK 12)

Additional respondents shared similar observations about not seeing as many salmon in spawning areas.

Escapement, subsistence users at the lake [Chignik Lake village], we do not see the numbers the weir is reporting. I have lived there all my life. We're hardly catching any fish up at the lake. Where are the numbers? The managers come and go, change methods of estimating escapement. (CLK 3)

There were so many fish up there [in Black Lake]. When I was a girl the fish were so thick people would just go beside them in the skiff and fling them out of the water onto the shore by hand to catch them. Now you have to go way up Scow River [Alec River] to find any. (CLK 1)

The escapement goal for kings was lowered several years back. I think the reason for lowering the goal is so that the issue cannot be brought forth on its own merits like you say it has created a situation where there is no incentive for, uh, the fishermen to allow kings to escape for the betterment of the king run and so it's left the door wide open and I know these people and I know that's not their intention to destroy the kings, it's just an opportunity that is presented to them and in certain cases they have this knowledge of where to get large number of kings and the [sockeye salmon] fishing was really slow so let's just go get a load of kings. (CHG 2)

... it's every year they [ADF&G] got to keep lower and lowering the escapement they're shooting for it. They go in front of the Legislature [Board of Fisheries] to lower it, and they lower it. Like I told Fish and Game that one time, I said, look at this system, you combine this river system [Chignik Lake] and the Black Lake river system, it is a long system, I asked why can't you put a million fish in either lake? Why is it [escapement goal for sockeye salmon] only a couple hundred, thousand? "Well, the lakes can't sustain the fish," they say. That's the same thing they said around here about our caribou season when I was screaming about our caribou diminishing. "Ah, there's no feed around here." Then what did the moose eat? How come our moose's thriving and our caribou's not? Well, we're hunting. We're losing it. And we lost it. I don't know. I finally come to find out, whoever screams the loudest and pays the most [wins]. That's what it rolls around to. Yah, when our run starts, and that fish over there [outside CMA] hit, fishermen start screaming about this place needs to open up, so ADF&G opens it up even if not enough escapement has occurred. (CLK 9)

I think Fish and Game has always managed by the low end of the escapement. They used to go by when my dad was still around us in early 1990s. Then they managed the high end and there was always plenty of fish returning. Dad would say that people from Bear River [near Port Heiden] used to come up here to fish the king run, it used to be strong. The kings would spawn along the entire river, even up into Chignik Lake, I remember as a kid. I would see kings in shallow area 10 to 15 years ago. At the shallows [downriver of the weir] I could almost walk across them they were so thick. (CLK 10)

I can tell you that what we have seen in the red salmon management plan is not only a disregard for the king salmon run in Chignik, but it is literally every single year it's a race to if the even lower goal is going to be met and how it conflicts with the early run and second run, so the only opportunity for king salmon to really come into the Chignik system in any numbers is dependent on a closure of the first run and a slow second run coming in, in other words creating a window for these fish to come in without being intercepted by the commercial fishermen. (CHG 2)

When Kodiak comm fish makes a statement [respondent later referred to circa 2000] that we will not change the Chignik salmon plan under any condition, red salmon management plan under any condition regardless of the king situation in Chignik, that is a final edict; that doesn't leave any room for anybody. (CHG 2)

Last year commercial fishermen were not allowed to keep any kings if caught. The lagoon is a small area to fish, and if a fisherman catches kings in their net, releases them, I know many of these fish get re-caught in the next guy's net, because I, too, have caught kings that have net marks on them. I agree with the department to not allow retention of kings, but I also worry that we are just killing those fish. I suggested to our CRAA [Chignik Regional Aquaculture Association] group to do a mortality study of kings caught and released, though I also worry this might cripple our commercial salmon fishery. (CLG 1)

How this relates to king salmon when you start changing the red fishery you will inadvertently change the king run. (CLG 8)

... yeah there are fewer kings [returning to the Chignik River], but not because of management. (CLK 12)

I think they need to make sure the escapement is up there, more than 1,700 fish. I think there should be at least 2,500 up there. The escapement goal, yeah one of the things that always bothered me about the way the State of Alaska manages us is there is no transfer of information from one manager to the other when they are changing. Yeah, and what happens that year is normal, so that is how it is year after year, you know, like we lost September. We haven't fished it in years and we used to fish August all the time, and these new managers come out and they say [for example], "Well, you only fished until August 15th last year, so that's pretty normal," and they look back at the records and say that has been happening, but if you go further back you will see that we fished all the way 'til the end of September. (CLG 1)

Department last few years has managed on lower end of escapement goals for both runs of sockeye and kings and is hurting our future salmon runs. (PVL 7)

ADFG policy change over last few years no longer enables local ADFG CMA managers to make independent fishery decisions, and instead were being made by competing managing groups that intercepts Chignik fish. (CHG 2)

Fish and Game manages escapement for both kings and sockeye, but it a sensitive issue as I am also a commercial fisherman and I want to protect the kings, but to not catch kings you also can't be catching sockeye. In years of poor king runs, ADFG will not allow a commercial fisherman to retain their kings if caught, but I feel that there is a high mortality rate once a king is caught and returned to ocean. Especially in lagoon, or the king will likely be caught again. (CLG 1)

One Chignik Lagoon respondent expressed concern about ADF&G gradually lowering the escapement goal for Chinook salmon.

The thing bad about it is that they did the same thing to the kings. We always use to get roughly between the catch and what escaped up there would be around 6–7,000 kings. You know, the weir would get roughly half of them. Now they lowered that escapement down to I heard 1,400 fish or something crazy. And they are doing this on the quiet. They don't tell anybody. I guess they don't want to have to argue with us guys, basically They reduced their numbers to meet their escapement! (CLG 1)

However, another Chignik Lagoon commercial fisherman respondent (CLG 11), when asked if he thought Chinook salmon runs were declining, replied, "I think we are still getting our kings. This year was a pretty good escapement, wasn't it?"

Some respondents voiced frustration that the managers at the weir do not spend enough years working in the Chignik area—some only stay two to four years and then they move on. Community members felt that managers stay long enough to begin to understand the system, and then they move on and a new manager must be trained again. Respondents said they would prefer to have a manager who spent enough years to really understand salmon runs and the Chignik watershed and to establish a working relationship with local people in order to help build trust and understanding. These respondents indicated that ADF&G circa 20 years ago had managers who stayed longer, developed a deeper understanding of the salmon runs in the Chignik watershed, and runs were managed based on their acquired knowledge; also, because of their longevity, more trusting relationships were established between ADF&G and the communities and the commercial fishermen. Two respondents from Chignik Lake expressed concern about ADF&G staff turnover.

If biologists lived here year around or would at least stick around longer than a couple of years, they would have better understanding of what goes on here. (CLG 5)

I believe our managers try to manage this fishery the best they can to ensure adequate escapement, but it appears they get overruled by the larger management in Kodiak. They always seem to favor Kodiak or Area M and the Board of Fisheries. They are supposed to protect fisheries, but they have failed Chignik. (CLG 6)

Management of Sport Fisheries: Region 2

Some respondents voiced concern over the number of clients that sport fishing guides were bringing to the Chignik River when the Chinook salmon are running, and some residents think that these sport fishers have more effect on the Chinook salmon returns than ADF&G fisheries managers understand or acknowledge. Two respondents (CLK 2 and CLK 3) commented how they have found dead Chinook salmon floating in the river that they presumed were caught and released by guided clients but did not survive. Overall, the concern expressed by some CMA residents was that the sport fish area managers were being too liberal with the number of sport fishing clients coming in from outside of the area⁹ and that this was one contributing factor in the Chinook salmon decline.

9. Note that sport fishing guides must annually register to operate in Alaska in fresh or salt water (see information on the ADF&G website: <http://www.adfg.alaska.gov/index.cfm?adfg=SFGuidesLicense.main>). However, ADF&G

Dead kelp and sport fishermen up and down the river, they go around the lake and get what they want. Then we find dead kings in the shallows [lower Chignik River]. (CLK 3)

... yeah, those guides they bring outsiders here to our river to sport fish for kings. Some of [the] guides are locals from these villages here. Yeah, it helps them make a living, I am cool with that, but when the kings are in there are a lot of sport fishermen that come here, a lot! Yeah, it pisses off a lot of people here, seems they just want to play with the fish, then throw it back and fish for a bigger one. We find dead kings in the river. That catch-and-release I think is bull. I like sport fishing for a king just as much as the next guy, but if I am going to catch it, I am going to sure as hell take it home and eat it. (CLK 2)

Do you know how many sport fishermen come up here? I have seen a huge change [decrease] in the population of kings in Chignik River and Lake. Back now to 12 years ago. Escapement and commercial fishing might be reason for less kings spawning. (CLK 9)

We need to control the sport fishermen in this [Chignik] river. There are a few guides that during the king run bring lots of clients here to fish. If a fish bleeds they die [after release]. But one, if you keep a dead fish, you get fined. I got fined \$6,000 one time for taking a dead king on my boat instead of throwing it overboard. I was concerned to not waste. (CLK 9)

A respondent from Chignik Lagoon, when asked if commercial fishermen have often had to release commercially caught Chinook salmon when escapement was low, responded that fishermen never had to do this up until there was an increase in sport fishermen fishing for Chinook salmon in the Chignik River.

No, we never had to do that. We have never had to release a king in all the years until the sports effort came in. And, I think, and I am probably as guilty of this as the next guy up there but, I think what is happening up there early on when we started sport fishing them, we would never go by the weir and tell them [ADF&G] what we brought home. So essentially, he [biologist] was getting his escapement probably, but we were taking maybe up to half their escapement back down through the weir between us and the sportsmen, and they had no idea this was happening. I think this is what has happened over the year They [ADF&G] knew they had problems the year of the co-op [2002–2005, cooperative fishery], so they were releasing them, the co-op would release all them kings, yes all of them. (CLG 1)

Another Chignik Lagoon respondent commented on the growing number of sport fishers and the effect it is having on Chinook escapement.

Well, you look back in history, yeah the problem isn't the escapement; it is how many sport fishermen are taking out of up there. We have always taken some kings and subsistence users. Lately there has been a lot more sport activity up there. I was part of it a few years ago, so I know how many we were taking. When we were doing it, we were taking the guide's boat out, there were two boats a day for six guys. So, there were 12 people a day, until they got their limit of five. So for a week we would be doing 30 kings. And I also picked them up out of the river from them being let go and they were bleeding out from the sport pressure. I don't know why they don't get them in the gate [at weir], but you go upstream, and you see them where the water slows down on the bottom, they [dead kings] are laying on

sport fish managers have no role in determining how many guided sport fishers operate in the CMA; that is not controlled directly by any regulation nor are there regulatory restrictions (e.g., "limited entry" or "drawing permits," etc.).

the bottom [of the river], they don't make it down to the gate at the weir. So, I know [ADF&G area management biologist] says he never sees them, but I do when I go up there. (CLG 11)

Management of Subsistence

Most respondents did not feel that subsistence fishing had much effect on Chinook salmon because so few are harvested using subsistence methods and most Chinook salmon used are removed from a commercial harvest. Rod and reel is a traditional and selective method for harvesting Chinook salmon and most residents acknowledge the inherently sustainable nature of this gear choice.

Kings aren't taken by many locals that I know of, but some do. If a guy wants a king they go down river and catch one ... yes, with a fishing pole. I have never seen anyone use a gillnet to catch a king... most of the nets used around here are too small [mesh size] to catch a king. One could hang a king net I suppose but why would you go the effort and expense too ... of that when you just want one or two kings? ... No one around here wants to kill off our king run ... by catching more than we need. (CLK 12)

A Chignik Lagoon resident spoke of his concern about declining Chinook salmon and non-retention policies for commercial fishermen since his family relies on about 10 kings per year that he brings home from his commercial harvest.

We usually bring home instead of sell our kings caught while commercial fishing, but last year [2013] Fish and Game did not allow us to retain larger sized kings if caught, so I was not able to bring any home that year from my boat. ... No, we never got any, I didn't have time to go up to the river and catch them with a rod so we went without, which was hard, we really like to smoke kings. But this year [2014] we caught lots of kings, and I brought home about 10, what we usually need. (CLG 5)

Other Human Effects

Interestingly, one respondent discussed the effect that the boat landing site on the Chignik River may be having on Chinook salmon. The boat landing is located at the end of a road leading from the community of Chignik Lake and is across from the ADF&G weir. Any large boats that need to access the community of Chignik Lake need to use this landing. Boats are docked there regularly to ship people and supplies to Chignik Lake. A respondent said that one of the primary Chinook salmon spawning streams in the lower Chignik River is in proximity to this landing. The individual mentioned observing many times when larger boats became stuck by the landing and, in the process of departing, Chinook salmon rearing habitat and eggs were harmed. Another Chignik Lake respondent indicated being concerned about trash being thrown in the river.

... one of the spots where the kings spawn, boats get stuck on the king bar, then the motors churn up the gravel right where the kings spawn ... in the Chignik River below the weir in the flats, the river flattens out there and where king spawn. (CLK 12)

I am sad to say that sometimes I have found trash thrown in this river that must be from some people in my village. I was not raised to do that. I am sure it is hurting our fish and bears. (CLK 1)

One Chignik Lagoon respondent thought that the communities needed more effective organization or avenues that allow for opportunities for the communities to openly and safely be able to voice input and concerns about subsistence or other resource management decisions. This respondent discussed lifelong residency in Chignik Lagoon and active participation in subsistence and commercial fishing, as well as

the ADF&G Chignik Fish and Game Advisory Committee and CRAA, and—given the breadth of those experiences—would like the communities to be able to establish a co-management authority with ADF&G or the U.S. Fish and Wildlife Service. This respondent also expressed great concern about the sustainability of the communities if salmon runs, both Chinook and sockeye, continued to decline, and expressed need to develop a more long-term approach to helping the communities remain sustainable if salmon runs continue to decline.

... we have our local Fish and Game [Chignik] Advisory Committee and CRAA, but most of the people that attend are we commercial guys that like to talk [chuckles], but most locals here especially subsistence users at the Lake or Perryville ... are very quiet ... culturally, not our way to make waves, we need a place at the table with Fish and Game where locals are comfortable to voice their opinion and be heard ... managing our fisheries and fish stocks. Our people have lived here long before the Russians came ... we have valuable knowledge about our fish that those biologists up there that come and go ... yeah, they could learn a lot from we Natives if they would invite us to the table and there is too much talk with locals about escapement and blaming Area M, blaming Fish and Game, fighting amongst ourselves as fishermen and communities ... I know I am one of those people! Chignik does get the short end of the stick it seems with Fish and Game ... but we are almost beyond that now, our king run is almost wiped out and we are heading that way with both our sockeye runs, too. We need to start figuring out how our communities are going to adapt, keep subsistence food on the table, and keep our kids in school, and also keep our commercial fisheries viable. (CLG 10)

CONCLUSIONS

We are at a static level that is just enough to support a very limited [Chinook salmon] sport fishery ... we can withstand a very small amount of subsistence take or, the department might term it sport fish but it ends up going into a local freezer. (CHG 2)

The feeling, deep down in your gut, that we are observers, that we are sitting back observing one of the more significant changes in this generation in terms of plants, animals, and when we circle around back to fish, because it is the economic lifeblood and also the most prolific protein source, that there is a lot of concern about the salmon. And a lot of anxiety. (CHG 2)

I am worried about our younger people for one thing you know but all my grandkids are just like us ... even the young ones they like to go out and go fishing and splitting fish and stuff. But you don't see their friends doing that. It just depends on how you raise your kids and the importance and values that you have to live by in order to survive out here in the wilderness. But it's not a wilderness to us, it's our home. (CLK 1)

Knowledge collected from residents in the study communities of Chignik Bay, Chignik Lagoon, Chignik Lake, and Perryville shows that many changes in the past 40 years have affected the ecosystems of the area and there exist many factors that individuals believe are contributing to the decline of Chinook salmon returns. Study results point to a local desire for the BOF and state fisheries managers to reconsider: the limits placed on Chinook salmon sport fishers who are not residents of the CMA, enforcement of home pack reporting requirements for Chinook salmon, requirements for how processors treat unclaimed home pack, and the escapement goals set by commercial fisheries managers. Furthermore, research data suggest that residents would like the state to discuss management limits for bycatch on federal Pacific cod and pollock trawl fisheries.

It is important for ADF&G to note that residents would prefer commercial fisheries managers stay for a tenure longer than two to four years (presuming the managers and the community members form a good

rapport). Residents see great value in having a commercial fisheries manager who they trust and rely on for support. There was also frustration expressed by numerous residents of all communities who think that ADF&G managers often fail to adequately inform fishermen and communities about management decisions, and they expressed that managers did not care to listen to local knowledge or local opinion that could be factored into fishery management decisions.

There is a lot of distrust and frustration that locals and fishermen have with ADF&G. Locals feel that they are not being adequately informed of management decisions and, or that local knowledge is not solicited, listened to, or factored into fishery management decisions. Outreach and meaningful dialogue between ADF&G, fishermen and communities is needed, that could lead to more effective salmon management, including educating the communities what they can also do to protect and enhance the Chignik watershed. (CHG 2).

Perhaps, most importantly, it should be noted that the respondents in this study were very concerned with all salmon stocks, including Chinook, and they often stated that they would rather catch fewer fish in order to increase escapement, and additionally have asked for further enforcement of home pack reporting requirements. The residents of the study communities value all salmon, including Chinook, for much more than economic value.

6. CONCLUSIONS AND RECOMMENDATIONS

This report concludes with summaries of key findings, followed by a list of recommendations for fisheries managers as well as community residents. The Chignik River supports the largest runs of sockeye and Chinook salmon on the south side of the Alaska Peninsula. All five Pacific salmon species found in Alaska return to the Chignik River, and they are all used for subsistence by residents of Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville, and Ivanof Bay. Division of Subsistence staff traveled to all communities in the Chignik Management Area (CMA), except Ivanof Bay, to conduct a combined total of 294 household salmon harvest and use surveys, including mapping of harvest areas, for study years 2014, 2015, and 2016, and also 38 key respondent interviews (KRIs) with 30 individual subsistence users. Survey data were used to evaluate subsistence harvest estimates based on the subsistence permit system and commercial fish tickets. Survey respondents assessed how well they were able to meet their households' salmon needs. In addition, respondents shared their knowledge and observations of the area's ecology, including perceived causes for the decline of Chinook salmon in the Chignik watershed.

From the data collected, researchers interpreted four main findings about Chinook salmon. First, Chinook salmon remain an important subsistence and commercial resource for the study communities. Second, Chinook salmon returning to the CMA and Chignik watershed were declining in abundance prior to the start of this study and continued to decline during the study years. Third, dramatic environmental and climatic changes are occurring in marine and fresh waters, and terrestrial habitats, in the region, which many respondents believe are responsible in part for the decline in salmon stocks. Lastly, estimates of salmon harvested in the CMA based on commercial fish ticket and permit data alone underestimate the number of salmon harvested and needed for subsistence in the study communities.

CONCLUSIONS FROM HARVEST SURVEY DATA

Data collected through subsistence harvest surveys, subsistence salmon permit returns, and ADF&G Division of Commercial Fisheries harvest tickets (records of salmon retained for home use, called "home pack") were all used to estimate salmon harvested for home use during the study years. All three data sources were used in comparative analysis to evaluate the reliability of harvest estimates of all salmon from subsistence permit and fish ticket data during non-study years. Data from all three study years displayed a significant difference between the salmon harvest reported on commercial fish tickets and subsistence permit returns versus the salmon harvest reported during household surveys.

Subsistence Permit Reporting

In every community during every study year, additional permits were returned during household harvest survey administration. Households whose members fished without a permit were assigned one ex post facto permit and the harvests recorded on the survey were added to the permit by research staff. Further, researchers were generally able to collect additional permits from households that fished with a permit that was not yet returned.

Survey results indicated that out of the total of 89 subsistence permits issued to residents of local communities for 2014, 32 (36%) were issued following the surveys to a member of each household that engaged in subsistence fishing but did not include any members who held permits while fishing. After surveys were completed, the number of permits issued to the study communities was revised from 57 to 89 (56% increase). Based on initial subsistence permit returns, the 2014 subsistence harvest estimate for CMA study community residents was 6,252 salmon, including 34 Chinook salmon. The harvest estimate from permits was adjusted following postseason surveys being completed, causing the subsistence harvest estimate to increase to 9,443 salmon harvested, including 146 Chinook salmon. This demonstrates a 51% increase from what was estimated from returned permits for all salmon, and a 329% increase for Chinook salmon alone.

Survey results indicated that out of the total 89 subsistence permits issued to residents of local communities for 2015, 46 (52%) were issued following the surveys to a member of each household that engaged in subsistence fishing but did not include any members who held permits while fishing. After surveys were completed, the number of permits issued to the study communities was revised from 43 to 89 (107% increase). Based on initial subsistence permit returns, the subsistence harvest estimate for the study communities in 2015 was 5,575 salmon, including 157 Chinook salmon. The harvest estimate from permits was adjusted following postseason surveys being completed, causing the subsistence harvest estimate to increase to 10,567 salmon, including 154 Chinook salmon. This demonstrates a 90% increase from what was estimated from returned permits for all salmon. Due to the change in permit system participation when comparing initial and postseason permit return rates, the Chinook salmon estimate did not change by a large amount.

Survey results indicated that out of the total 83 subsistence permits issued to residents of local communities for 2016, 39 (47%) were issued following the surveys to a member of each household that engaged in subsistence fishing but did not include any members who held permits while fishing. After surveys were completed, the number of permits issued to the study communities was revised from 44 to 83 (89% increase). Based on initial subsistence permit returns, the subsistence harvest estimate for CMA study community residents in 2016 was 6,061 salmon, including 47 Chinook salmon. The harvest estimate from permits was adjusted following postseason surveys being completed, causing the subsistence harvest estimate to increase to 7,861 salmon, including 55 Chinook salmon. This demonstrates a 30% increase from what was estimated from returned permits for all salmon, and a 200% increase for Chinook salmon alone.

Survey data show that permit data alone underestimated the study communities' Chinook salmon harvest with subsistence nets, seines, and rod and reel (allowable gear under federal subsistence regulations) by an average of 49% over the three study years and all salmon by an average of 56% over the three study years; households that fished without a permit accounted for most of this difference.

Salmon Harvests by Gear Type

Over the three study years, household harvest surveys indicated that about 65% of Chinook salmon harvested for home use in the four CMA study communities was retained from commercial harvests, about 21% was harvested with subsistence nets or seines (or another less common subsistence method), and about 14% was taken with rod and reel.

As discussed in both chapters 4 and 5, reporting of home pack is generally inconsistent or does not occur at all. For the study communities combined, in 2014 and 2015 the number of total salmon retained reported in household surveys exceeded the number reported on fish tickets by more than 1,000 fish; for 2016, the difference was more than double with approximately 2,500 more retained salmon reported in surveys than on fish tickets. Given that for Chinook salmon, specifically, the majority of fish for the three years combined were obtained by commercial removals, it is evident that the full scope of Chinook salmon used in households in these study communities has not been accounted for by the annual harvest monitoring programs.

CONCLUSIONS FROM KEY RESPONDENT INTERVIEWS

Residents from all four study communities described many changes over the past 40 years that have affected the ecosystems of the area, as well as the decline in Chinook salmon returns. Many of the respondents interviewed thought that the returns of Chinook salmon to the CMA have been on a decline, and most respondents were concerned that eventually the Chignik River stock would eventually become extinct. However, respondents did not provide a single, predominant reason for this decline, but rather pointed to a combination of multiple factors. These factors were organized into several categories, including environmental changes related to climate changes, overfishing or effects of long-term fishery management decisions (including inadequate escapement), and other human influences such as ocean pollution.

Environmental Changes

- Residents in all four study communities noted changes to climate and climate patterns—noting that the weather is now unpredictable, and warmer air and water temperatures are having a concerning effect on salmon populations.

Harvest Reporting and Fisheries Management

- Residents identified non-CMA resident Chinook salmon sport fishers as contributing to the decline in the Chinook salmon population. Residents called upon ADF&G fisheries managers to reconsider the limits placed on these non-local fishers.
- Inadequate reporting of home pack of Chinook salmon was another factor cited by residents as contributing to declines in the returns of Chinook salmon. Residents called for commercial fisheries managers and processors to increase their reporting requirements both for fishers taking home pack and for unclaimed home pack left at commercial processors.
- Residents also discussed how they would like commercial fisheries managers to consult local fishers and consider their concerns before setting escapement goals. Furthermore, residents would prefer commercial fisheries managers to stay for a tenure longer than 2–4 years (presuming the managers and the community members form a good rapport). Residents see great value in having a commercial fisheries manager who they trust and can work with to sustainably manage the Chinook stock.
- It was clear that residents would like the state to discuss with the appropriate agencies the management limits for bycatch for federal Pacific cod and pollock trawl fisheries, because it is believed that these fisheries play a significant role in the declining salmon populations.

Other Human Influences

- Residents from all four study communities identified ocean contamination concerns, such as waste from the 2011 Fukushima nuclear accident in Japan and plastic waste and other human-caused contaminants in the ocean, that are thought to influence salmon returns.
- Some residents expressed concern over increased numbers of hatchery fish competing with wild salmon, including Chinook salmon, for food and good habitat in the Pacific Ocean.

RECOMMENDATIONS

- Researchers of this study suggest a need for a more effective avenue—such as a memorandum of understanding—allowing for opportunities for more open conversations with communities about subsistence and enabling communities to have a stronger voice in state and federal fishery management decisions, other than just input from the commercial fisheries fleet or the Chignik Seiners Association. One respondent cited the Kuskokwim River Inter-Tribal Fish Commission¹ as a potential model.
- There are dual programs administered for state and federal subsistence fisheries for the Chignik area, which is the genesis for three recommendations. The federal program provides additional subsistence opportunities for local qualified residents of the study communities for fishing in federal waters; however, few residents interviewed in the study years were aware of the federal subsistence fishery and the federal permit, and many of those who did had indicated that the dual system caused much confusion.

1. Kuskokwim River Inter-Tribal Fish Commission. 2019. “History & Mission,” <https://www.kuskosalmon.org/mission-history> (accessed December 2020).

- It is recommended that state and federal fisheries managers work together to provide better outreach and information to the communities to help residents wishing to subsistence fish have an improved understanding of both fisheries programs and associated permits. State and federal managers should help people to better understand the difference between the permits and when a state or federal permit is needed, and to help those who have both a state and federal permit to understand what permit is appropriate to use for recording their harvests.
- Estimating subsistence harvests from both state and federal permits, when available, provides for a better harvest estimate than relying on state permits alone. It is this researcher's recommendation that ADF&G and the U.S. Fish and Wildlife Service (USFWS) Federal Subsistence Board (FSB) work together and make both state and federal permits available in each community by the same vendors. Improved education, distributions of both state and federal permits, and additional effort to see that permits are returned will allow both state and federal managers improved understanding of community harvests.
- It is also recommended that the Alaska Board of Fisheries (BOF) and FSB work together to make both state and federal subsistence regulations that govern subsistence fishing in the CMA as consistent as possible, which would lessen confusion and allow for more reliable harvest assessments.
- Residents of the study communities value all salmon, including Chinook, for much more than economic value, though most recognize that if commercial fishing opportunities were eliminated due to insufficient salmon runs to the CMA, it would be difficult for these communities to remain sustainable. Focusing primarily on escapement may lessen what the state could do to enable these communities to adapt to changing social and environmental changes, such as cultural activities, food sustainability, and education, among other factors. Subsistence salmon fishing provides substantial quantities of food to all community residents, ties together extended families and neighbors, creates bonds between adults and children through the experience of continued transmission of knowledge, and perpetuates connections between individuals and the natural environment. The researchers of this study believe that for these remote communities to be successful, ADF&G, USFWS, the BOF, and the FSB need to work more with residents and fishers to find real solutions to the declining salmon stocks. This could be achieved by developing outreach programs with local communities in partnership with ADF&G, the USFWS Office of Subsistence Management, and the Bristol Bay Native Association, and by facilitating meaningful dialogue that explains the changes that are occurring with the habitat and salmon runs and discusses which mitigation efforts are practical. Also, increased dialogue would allow communities, with their local knowledge, to provide input on what they believe can be done by the managers and communities to restore, enhance, and protect the Chignik watershed.

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APPENDIX A—SURVEY FORM (2015)

Chignik Management Area, Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville

April 1st, 2015 to present

This survey is used to estimate subsistence salmon harvests and uses for the Chignik Management Area, for 2015. Additional questions will be asked to compare your household's use and harvest of salmon in previous years. We share this information with the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service, the National Park Service, the Alaska Board of Fisheries, and the Federal Subsistence Board. We work with the local Fish and Game Advisory Committees, the Federal Regional Advisory Councils, and the Chignik Regional Aquaculture Association to better manage subsistence and to implement the federal and state subsistence priorities.

We will NOT identify your household, or members of your household. We will NOT use this information for enforcement. Participation in this survey is voluntary. Even if you agree to be surveyed, you may stop at anytime.

HOUSEHOLD ID:	
COMMUNITY ID:	
INTERVIEWER 1:	
INTERVIEWER 2:	
INTERVIEW DATE:	
START TIME:	
STOP TIME:	
DATA CODED BY:	
DATA ENTERED BY:	
SUPERVISOR:	



COOPERATING ORGANIZATIONS

DIVISION OF SUBSISTENCE
ALASKA DEPT OF FISH & GAME
333 RASPBERRY ROAD
ANCHORAGE, AK 99518
267-2353

NATIVE VILLAGE OF PERRYVILLE
BOX 89
PERRYVILLE, AK 99648
853-2203

CHIGNIK BAY
TRIBAL COUNCIL
BOX 50
CHIGNIK AK. 99564
749-2445

CHIGNIK LAGOON
VILLAGE COUNCIL
BOX 9
CHIGNIK LAGOON, AK 99565
840-2281

CHIGNIK LAKE
TRADITIONAL COUNCIL
BOX 33
CHIGNIK LAKE, AK 99548
845-2212

HOUSEHOLD MEMBERS

HOUSEHOLD ID

First, I would like to ask about the people in your household, permanent members of your household who sleep at your house. This includes students who return home every summer. I am NOT interested in people who lived with you temporarily, even if they stayed several months.

Last year, that is, between April 1, 2015, and present, WHO were the head or heads of this household?

Is this person answering questions on this survey?	How is this person related to HEAD 1?	Is this person MALE or FEMALE?	Is this person an ALASKA NATIVE?	In what year was this person born?	How many years has this person lived in Chignik/Perryville area?	In 2015, did this person have a subsistence SALMON permit?			
ID#	circle	relation	circle	circle	year	number	circle	permit number	return
HEAD	Y N		M F	Y N			Y N ?		Y N ?
1									
NEXT enter spouse or partner. If household has a SINGLE HEAD, leave HEAD 2 row BLANK, and move to PERSON 3.									
HEAD	Y N		M F	Y N			Y N ?		Y N ?
2									
BELOW, enter children (oldest to youngest), grandchildren, grandparents, or anyone else living full-time in this household.									
PERSON 3	Y N		M F	Y N			Y N ?		Y N ?
3									
PERSON 4			M F	Y N			Y N ?		Y N ?
4	0								
PERSON 5			M F	Y N			Y N ?		Y N ?
5	0								
PERSON 6			M F	Y N			Y N ?		Y N ?
6	0								
PERSON 7			M F	Y N			Y N ?		Y N ?
7	0								
PERSON 8			M F	Y N			Y N ?		Y N ?
8	0								
PERSON 9			M F	Y N			Y N ?		Y N ?
9	0								
PERSON 10			M F	Y N			Y N ?		Y N ?
10	0								
PERSON 11			M F	Y N			Y N ?		Y N ?
11	0								
PERSON 12			M F	Y N			Y N ?		Y N ?
12	0								
PERSON 13			M F	Y N			Y N ?		Y N ?
13	0								
PERSON 14			M F	Y N			Y N ?		Y N ?
14	0								

HOUSEHOLD INFORMATION: 01

RETAINED COMMERCIAL HARVESTS

HOUSEHOLD ID

1. Do you or members of your household USUALLY participate in commercial salmon fisheries?..... Y N
2. During the last year (April 1st, 2015 to PRESENT),
did you or members of your household PARTICIPATE in a commercial salmon fishery?..... Y N

IF the answer to QUESTION 2 is NO, go to the subsistence harvests section.

IF the answer is YES, continue on this page...

During the last year,¹

did you or members of your household....

- A ...FISH commercially for salmon?
B ...KEEP any salmon from your commercial catch for your own use² or to share?

If
KEEP is
"yes"

Read names below in blanks above	A COM FISH?	B KEEP?
CHINOOK SALMON	Y N	Y N
KING SALMON		
113,000,001		
SOCKEYE SALMON	Y N	Y N
RED SALMON		
115,000,001		
COHO SALMON	Y N	Y N
112,000,001		
CHUM SALMON	Y N	Y N
DOG SALMON		
111,000,001		
PINK SALMON	Y N	Y N
HUMPIES		
114,000,001		
	Y N	Y N
	Y N	Y N
	Y N	Y N
	Y N	Y N
	Y N	Y N

Please estimate how many salmon ALL MEMBERS OF YOUR HOUSEHOLD removed from commercial harvests for personal use during the last year.

Include COMMERCIALY HARVESTED salmon that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If helping others, report ONLY THIS HOUSEHOLD'S share.

How many were removed for your OWN USE? ⁵	How many were removed for your CREW? ⁵	How many were removed to give to OTHERS?	Person ID from page 2	
number	number	number	number	comments

RETAINED COMMERCIAL HARVESTS continued on next page...

¹ "LAST YEAR" means from APRIL 1, 2015, and PRESENT.

² "USE" includes eating, feeding to dogs, sharing or trading with others, etc.

³ UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.

⁴ "INCIDENTAL CATCH" means the fish kept was not being commercially fished. For example, a king salmon kept from a chum commercial fishery.

⁵ Double counting (captains' removals for crew members and crew members' removal for own uses) is fixed in analysis. Collect both.

COMMERCIALY HARVESTED RESOURCES: 03

Subsistence Harvests: Salmon

Household ID

1. Do you, or members of your household USUALLY harvest salmon?..... Y N ?
2. During the last year (April 1st, 2015 to PRESENT), did you or members of your household USE or TRY to fish for salmon? Y N ?

If the answer to question 2 is NO, go to the SALMON assessment questions page.

If the answer to both questions are YES, continue on this page...

During the last year, did you, or members of your household,...

- A: Use _____ salmon?
- B: Try to harvest _____ salmon?
- C: Harvest (catch) _____ salmon?
- D: Receive _____ salmon from another household?
- E: Give _____ salmon to another household?

Condition, or spawning stage, of salmon...

- B: "bright" or pre-spawn salmon
- R: "red" or spawning salmon
- S: "spawned-out" or post-spawn salmon
- ?: "unknown" or salmon whose spawning condition is not known

If the answer to the harvest question (C) is yes, please estimate how many salmon all members of your household harvested for subsistence uses during the last year. Record salmon taken from commercial catch while commercial fishing, on previous page.

Read the species names below in the blanks above.

Include salmon that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. Report only this household's share of the harvest.

	A	B	C	D	E	Date	Location	Condition	Gear type	Harvest
	Use	Try	Harv	Rec	Give	mm / dd	name	circle ONE	(NOT commercial)	number
	circle one									
SOCKEYE	Y N	Y N	Y N	Y N	Y N			B R S ?		
115 000 000										

								B R S ?		
								B R S ?		
								B R S ?		
								B R S ?		
								B R S ?		
								B R S ?		
								B R S ?		

	Use	Try	Harv	Rec	Give	Date	Location	Gear type	Harvest
						mm / dd	name	(NOT commercial)	number
	circle one								
CHINOOK	Y N	Y N	Y N	Y N	Y N				
113 000 000									

SUBSISTENCE SALMON HARVESTS: 04

Subsistence Harvests: Salmon continued...

Household ID

If the answer to the harvest question (C) is yes, please estimate how many salmon all members of your household harvested for subsistence uses during the last year. Record salmon taken from commercial catch while commercial fishing, on previous page.

Read the species names below in the blanks above.

Include salmon that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. Report only this household's share of the harvest.

	A Use	B Try	C Harv	D Rec	E Give	Date dd / mm	Location name	Condition circle ONE	Gear type (NOT commercial)	Harvest number
COHO	Y N	Y N	Y N	Y N	Y N			B R S ?		
112 000 000								B R S ?		
								B R S ?		
								B R S ?		
								B R S ?		
								B R S ?		
								B R S ?		
								B R S ?		
								B R S ?		

	Use	Try	Harv	Rec	Give	Date dd / mm	Location name	Gear type (NOT commercial)	Harvest number
CHUM	Y N	Y N	Y N	Y N	Y N				
111 000 000									

	Use	Try	Harv	Rec	Giv	Date dd / mm	Location name	Gear type (NOT commercial)	Harvest number
PINK	Y N	Y N	Y N	Y N	Y N				
114 000 000									

SUBSISTENCE SALMON HARVESTS: 04

SUBSISTENCE SUMMARY: EARLY RUN "BRIGHT" SOCKEYE SALMON

HOUSEHOLD ID

115,000,000

ASSESSMENTS: EARLY RUN "BRIGHT" SOCKEYE SALMON

Note: Ask the following questions to all households and continue with other questions if the household USED EARLY RUN "BRIGHT" SOCKEYE SALMON last year (April 1, 2015 to present) or in recent years.

Last year¹

...did your household use LESS, SAME, or MORE EARLY RUN "BRIGHT" SOCKEYE SALMON than in recent years?.... X L S M

If LESS or MORE...

X = do not use

WHY was your use different?.....

1

2

Note: Ask the following questions only for households that have USED EARLY RUN "BRIGHT" SOCKEYE SALMON last year* or in recent years. If no to either time period, then go to next page.....

Last year¹

...did your household GET ENOUGH EARLY RUN "BRIGHT" SOCKEYE SALMON ? Y N

If NO, about how many EARLY RUN "BRIGHT" SOCKEYE SALMON does your household need annually?

If NO, did your household do anything DIFFERENTLY because they did NOT get enough EARLY RUN "BRIGHT" SOCKEYE SALMON ? Y N

IF YES...

What did your household do differently?

1

2

How would you describe the impact of your household not getting enough EARLY RUN "BRIGHT" SOCKEYE SALMON last year?

circle method(s) not noticable? minor? major? severe?
(0) (1) (2) (3)

Note: Ask the following questions only for households that HARVESTED or ATTEMPTED to harvest EARLY RUN "BRIGHT" SOCKEYE SALMON last year.*

Last year¹

... did you or members of your household need to work harder (spend more time / take more trips) than you usually have in recent years in order to get the amount of EARLY RUN "BRIGHT" SOCKEYE SALMON , that you needed? Y N

If YES, please explain why.

1

2

Last year¹

... did you or members of your household need to travel further, or to different locations than you usually go in order to harvest EARLY RUN "BRIGHT" SOCKEYE SALMON ? Travel further: Y N
Different locations: Y N

If YES, please explain why and where?

1

2

How do you usually harvest your EARLY RUN "BRIGHT" SOCKEYE SALMON ? circle methods(s)

Home Pack? Seine? Set gillnet? Rod and Reel? Handline? Other?
(4) (7) (5) (15) (16) (17)

1

2

Have you observed any changes to the number (abundance) of EARLY RUN "BRIGHT" SOCKEYE SALMON in your area? Y N

IF YES...

What changes have you observed?

1

2

Have you observed any changes in the quality or appearance of EARLY RUN "BRIGHT" SOCKEYE SALMON you harvested last year? Y N

IF YES...

What changes have you observed?

1

2

1) "Last year" means from April 1st, 2015 to PRESENT.

ASSESSMENTS OF EARLY RUN "BRIGHT" SOCKEYE SALMON : 66

SUBSISTENCE SUMMARY: SOCKEYE (RED) SALMON

HOUSEHOLD ID

ASSESSMENTS: SOCKEYE (RED) SALMON

115,000,000

.....continued from previous page

Have you observed any changes in the behavior of EARLY RUN "BRIGHT" SOCKEYE SALMON in your area; such as run timing or harvest location?

Y N

IF YES...

What changes have you observed?

1

2

Do you feel there is adequate escapement of EARLY RUN "BRIGHT" SOCKEYE SALMON through the Chignik River Weir to maintain a future healthy stock as well as enough to provide for subsistence needs?

Y N

IF NO, please explain.

1

2

Do you have any other comments or concerns about EARLY RUN "BRIGHT" SOCKEYE SALMON ?

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

1) "Last year" means from April 1st, 2015 to PRESENT.

ASSESSMENTS OF EARLY RUN "BRIGHT" SOCKEYE SALMON : 66

SUBSISTENCE SUMMARY: LATE RUN "REDFISH/ SPAWNOUT" SOCKEYE SALMON HOUSEHOLD ID

ASSESSMENTS: LATE RUN "REDFISH/ SPAWNOUT" SOCKEYE SALMON

117,050,000

.....continued from previous page

Have you observed any changes in the size, quality, or appearance of LATE RUN "REDFISH/ SPAWNOUT" SOCKEYE SALMON you harvested last year?

Y N

IF YES...

What changes have you observed?

1

2

Have you observed any changes in the behavior of LATE RUN "REDFISH/ SPAWNOUT" SOCKEYE SALMON in your area; such as run timing or harvest location?

Y N

IF YES...

What changes have you observed?

1

2

Do you feel there is adequate escapement of LATE RUN "REDFISH/ SPAWNOUT" SOCKEYE SALMON through the Chignik River Weir to maintain a future healthy stock as well as enough to provide for subsistence needs?

Y N

IF NO, please explain.

1

2

Do you have any other comments or concerns about LATE RUN "REDFISH/ SPAWNOUT" SOCKEYE SALMON ?

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins or other markings on the paper.

SUBSISTENCE SUMMARY: CHINOOK (KING) SALMON

HOUSEHOLD ID

ASSESSMENTS: CHINOOK (KING) SALMON

113,000,000

Note: Ask the following questions to all households and continue with other questions if the household USED CHINOOK (KING) SALMON last year (April 1, 2015 to present) or in recent years.

Last year¹

...did your household use LESS, SAME, or MORE CHINOOK (KING) SALMON than in recent years?

X L S M

If LESS or MORE...

(X = do not use)

WHY was your use different?.....

1

2

Note: Ask the following questions only for households that have USED CHINOOK (KING) SALMON last year or in recent years. If no to either time period, then go to next page.....*

Last year¹

...did your household GET ENOUGH CHINOOK (KING) SALMON ?

Y N

If NO, about how many CHINOOK (KING) SALMON does your household need annually?

If NO, did your household do anything DIFFERENTLY because they did NOT get enough CHINOOK (KING) SALMON ?

Y N

IF YES...

What did your household do differently?

1

2

How would you describe the impact of your household not getting enough CHINOOK (KING) SALMON last year?

circle method(s) not noticable? minor? major? severe?
(0) (1) (2) (3)

Note: Ask the following questions only for households that HARVESTED or ATTEMPTED to harvest CHINOOK (KING) SALMON last year.*

Last year¹

... did you or members of your household need to work harder (spend more time each outing / take more trips) than you usually have in recent years in order to get the amount of CHINOOK (KING) SALMON , that you needed?

Y N

If YES, please explain why.

1

2

Last year¹

... did you or members of your household need to travel further, or to different locations than you usually go in order to harvest CHINOOK (KING) SALMON ?

Travel further: Y N

Different locations: Y N

If YES, please explain why and where?

1

2

Where do you usually harvest your CHINOOK (KING) SALMON ?

How do you usually harvest your CHINOOK (KING) SALMON ?

circle methods(s)

Home Pack?
(4)Seine?
(7)Set gillnet?
(5)Rod and Reel?
(15)Handline?
(16)Other?
(17)Specify
.....

1

2

If you use a rod and reel or hook and line to harvest CHINOOK (KING) SALMON , why? circle response(s)

Conservation?
(1)Selectivity?
(2)Gillnet mesh too small?
(3)Tradition?
(4)Ease?
(5)Fun?
(6)Other?
(7)

1

2

Have you observed any changes to the number (abundance) of CHINOOK (KING) SALMON in your area?

Y N

IF YES...

What changes have you observed?

1

2

Have you observed any changes in the size, quality, or appearance of CHINOOK (KING) SALMON you harvested last year?

Y N

IF YES...

What changes have you observed?

1

2

continue on next page.....

1) "Last year" means from April 1st, 2015 to PRESENT.

ASSESSMENTS OF CHINOOK (KING) SALMON : 66

.....continued from previous page

Have you observed any changes in the behavior of CHINOOK (KING) SALMON in your area; such as run timing or harvest location?

Y N

IF YES...

What changes have you observed?

1

2

Do you feel there is adequate escapement of CHINOOK (KING) SALMON through the Chignik River Weir to maintain a future healthy stock as well as enough to provide for subsistence needs?

Y N

IF NO, please explain.

1

2

Do you have any other comments or concerns about CHINOOK (KING) SALMON ?

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

1) "Last year" means from April 1st, 2015 to PRESENT

ASSESSMENTS OF CHINOOK (KING) SALMON : 66

CHIGNIK: 85

SUBSISTENCE SUMMARY: OTHER SALMONHOUSEHOLD ID **ASSESSMENTS: COHO (SILVERS), PINK (HUMPIES), CHUM (DOG) SALMON**

Note: Ask the following questions to all households and continue with other questions if the household USED OTHER SALMON last year (April 1, 2015 to present) or in recent years.

Last year¹

...did your household use LESS, SAME, or MORE OTHER SALMON than in recent years?

X L S M ☐

If LESS or MORE...

(X = do not use)

WHY was your use different?.....

1 ☐2 ☐

Note: Ask the following questions only for households that have USED OTHER SALMON last year* or in recent years. If no to either time period, then go to next page.....

Last year¹

...did your household GET ENOUGH OTHER SALMON ?

Y N ☐

If NO, about how many OTHER SALMON does your household need annually?

 ☐

If NO, did your household do anything differently because you did not get enough OTHER SALMON ?

Y N ☐

If YES...

What did your household do differently?

1 ☐2 ☐

How would you describe the impact of your household not getting enough OTHER SALMON last year? circle method(s)

circle method(s)	not noticeable?	minor?	major?	severe?
	(0)	(1)	(2)	(3)

Note: Ask the following questions only for households that HARVESTED or ATTEMPTED to harvest OTHER SALMON last year*.

Last year¹

... did you or members of your household need to work harder (spend more time each outing / take more trips) than you usually have in recent years in order to get the amount of OTHER SALMON , that you needed?

Y N ☐

If YES, please explain why.

1 ☐2 ☐Last year¹

... did you or members of your household need to travel further, or to different locations than you usually go in order to harvest OTHER SALMON ?

Travel further: Y N ☐Different locations: Y N ☐

If YES, please explain why and where?

1 ☐2 ☐

Where do you usually harvest your OTHER SALMON ?

How do you usually harvest your OTHER SALMON ?

circle method(s)

Home Pack?
(4)Seine?
(7)Set gillnet?
(5)Rod and Reel?
(15)Handline?
(16)Other?
(17)Specify
.....1 ☐2 ☐

If you use a rod and reel or hook and line to harvest OTHER SALMON , why?

circle response(s)

Conservation?
(1)Selectivity?
(2)Gillnet mesh too small?
(3)Tradition?
(4)Ease?
(5)Fun?
(6)Other?
(7)1 ☐2 ☐

Have you observed any changes to the number (abundance) of OTHER SALMON in your area?

Y N ☐

If YES...

What changes have you observed?

1 ☐2 ☐

Have you observed any changes in the size, quality, or appearance of OTHER SALMON you harvested last year?

Y N ☐

If YES...

What changes have you observed?

1 ☐2 ☐

continue on next page.....

1 or *) "Last year" means from April 1st, 2015 to present.

ASSESSMENTS OF OTHER SALMON : 66

ASSESSMENTS: OTHER SALMON

117,050,000

.....continued from previous page

Have you observed any changes in the behavior of OTHER SALMON in your area; such as run timing or harvest location?

Y N

IF YES...

What changes have you observed?

1

2

Do you feel there is adequate escapement of OTHER SALMON through the Chignik River Weir to maintain a future healthy stock as well as enough to provide for subsistence needs?

Y N

1

IF NO, please explain.

1

2

Do you have any other comments or concerns about OTHER SALMON ?

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

1) "Last year" means from April 1st, 2015 to PRESENT.

ASSESSMENTS OF OTHER SALMON : 66

CHIGNIK: 85

COMMENTS & SUMMARY HOUSEHOLD ID

HOUSEHOLD ID

QUESTIONS, COMMENTS, CONCERNS

Do you have any questions, comments, or concerns?

INTERVIEW SUMMARY

Use this space for interviewer's comments about survey, especially factors that might have affected the household's responses.

BE SURE TO FILL IN THE STOP TIME ON THE FIRST PAGE!!!!

INTERVIEW SUMMARY: 30

APPENDIX B—KEY RESPONDENT INTERVIEW PROTOCOLS

Chignik Chinook Salmon Initiative Project- 2014 Study Year
Semi-structured Key Respondent Interview Guide

1. How many years have you lived in the Chignik Lake/Bay/Lagoon/Perryville area?
2. How many years (nonconsecutively) have you been subsistence fishing for Chignik salmon?
3. When and why did you start subsistence fishing for salmon in the Chignik Lake/Bay/Lagoon/Perryville area? (if has always fished since childhood then what age did they start participating)?
4. Who taught you how to subsistence fish?
5. Why do you continue to subsistence fish for salmon in the Chignik Lake/Bay/Lagoon/Perryville area?
6. What species of salmon do you fish for?
7. If you fish for Chinook “King” salmon, how do you harvest them?

Gill net or Seine? Rod and Reel? Removal from commercial harvest?
8. Can you recall any year’s subsistence fishing that were significant for any reason?
9. Can you recall the locations and years you harvested (or experienced) the largest number of salmon (any species)?
10. Can you recall the locations and years you harvested (or experienced) the smallest number of salmon (any species)?
11. Have you seen any changes in the marine and freshwater environment where you fish? (i.e. water temperature, weather patterns, air temperature, etc.)?
 - i. Over what period of time have you noticed these changes?
 - ii. Do you believe there are connections between these environmental changes and the Chignik Chinook salmon?
12. What observations have you made regarding Chinook salmon during your time as a subsistence fisher in the Chignik Lake/Bay/Lagoon/Perryville area?
 - a. Have you noticed any changes in the behavior of Chinook salmon during your time as a subsistence fisher? (i.e. is where they get caught in the net changing, is their behavior changing under different climactic conditions, etc.)?
 - b. Have you seen changes in the appearance of Chinook salmon during your time as a subsistence fisher? (i.e. are they changing in size, color, etc.)?

Chignik Chinook Salmon Initiative Project- 2014 Study Year
Semi-structured Key Respondent Interview Guide

- c. Have you made any observations regarding other species in the Chignik Lake/Bay/Lagoon/Perryville area?
 - a. Do you believe there is any connection between the changes in these species and the Chinook salmon?
- 13. What knowledge has been passed down to you regarding the Chignik Chinook salmon run, the environment, and the other species in the Chignik Lake/Bay/Lagoon/Perryville area?
 - a. Who did you acquire this knowledge from?
- 14. Do you believe there has been a decline in the Chignik Chinook salmon run?
 - a. If yes, what do you believe to be the cause of the decline?
 - b. Do you ever take kings home for subsistence? How many do you like to have for a season and have you been getting your target number in recent years?
- 15. What do you think the managers and biologists believe is happening with the Chinook salmon stocks?
- 16. What do you believe should be done to preserve and/or rebuild the Chignik Chinook salmon stocks (in terms of both management and biology)?
- 17. Do you have anything else you would like to share about Chinook salmon or other salmon?

Chignik Chinook Salmon Initiative Project- 2016 Study Year
Key Respondent Semi-Structured Interview Guide

Subsistence Use/ harvest of Chinook Salmon

- What type of salmon do you eat?
- What is your preferred salmon you eat? And why?
- Do you like/ eat Chinook Salmon? If not, why?
- If you obtain or receive Chinook salmon:
 - How do you process Chinook salmon?
 - Why do you process them that way?
- Do you subsistence fish for Chinook Salmon?
 - Where (location) do you fish for them?
 - What type of gear do you usually use to catch them?
 - Gillnet
 - Seine
 - Rod and Reel
 - Removal from commercial harvests?
 - Why do you use that gear to catch Chinook salmon?
 - How many do you usually harvest annually?
 - Have you in recent years been able to get enough to meet your needs?
 - If not, why did you not get enough?

Commercial Fishing:

- Do you commercial fish?
- Do you keep any Chinook salmon from your commercial fish for subsistence?
 - Why do you keep Chinook salmon and not sell them?
- Do you feel that commercial salmon fishing is impacting (hurting or helping) the Chinook Salmon runs to the Chignik watershed?
 - If so how?

Sport Fishing:

- Do you use rod and reel to fish for Chinook salmon?
 - If so, do you keep the salmon and use it for subsistence?
- Tell me about the presence of sport fishing with nonresidents or guides on Chignik River?
- Do you think non-resident sport fishermen that come with guides are impacting the Chinook escapement?
 - If so how?
- Do you feel resident subsistence fishermen are impacting Chinook Salmon escapement to Chignik Watershed?
 - If so how/

Chignik Chinook Salmon Initiative Project- 2016 Study Year
Key Respondent Semi-Structured Interview Guide

History:

- Can you tell me about your knowledge of Chinook Salmon?
 - Are the runs to the Chignik watershed/ Chignik River better or worse?
 - – Why are they better (or) worse?
 - If worse, why do you think is the cause or causes of the decline of Chinook salmon?
- Have you noticed any changes in the health or quality of Chinook salmon?
 - What do you think is causing those changes?
- How about the quality of the water? (temperature, water levels, pollution)
 - How do changes in the weather patterns warming or cooling, wet or dry, affect your fishing and your harvests?
 - Have you observed any changes to the migration timing of Chinook salmon?
 - – if so, do you have an idea of what is causing those changes

Regulations:

- Do you feel there is adequate escapement of Chinook salmon in the Chignik River?
- What do you think could or should be done to improve the escapement of Chinook Salmon to the Chignik River?
- Are any regulations affecting your opportunity for subsistence fishing for Chinook?
- Do you have any recommendations for regulatory change or management?
- If you were the fishery manager for Chignik what would you do to ensure that adequate escapement of Chinook salmon to the Chignik River is achieved?
- Do you have anything else to add, comments or questions?

Chignik Chinook Salmon Initiative Project- 2014-2016 Study Years
Priority Interview Questions for
Semi-structured and unstructured interviews

1. What knowledge has been passed down to you regarding the Chignik Chinook “King” salmon run, the environment, and the other species in the Chignik Lake/Bay/Lagoon/Perryville area?
 - a. Who did you acquire this knowledge from?
2. Do you ever take king salmon home for subsistence?
 - a. How many does your household like to have for a season, and have you been getting your target number in recent years?
 - b. What gear do you usually use to harvest/ obtain king salmon?
3. Do you believe there has been a decline in the Chignik River King salmon run?
 - a. If yes, what factor or factors do you believe to be the cause of the decline and how? (i.e.: climate change, environmental/ habitat change, human effects, commercial, sport, or subsistence overfishing, fishing, pollution, management, regulations.).
 - b. How long have you observed this decline?
4. Do you think there is adequate escapement objectives for Chinook/ king Salmon in the Chignik River?
5. What do you think the managers and biologists believe is happening with the king salmon stocks for the Chignik Watershed?
6. What do you believe should be done to preserve and/or rebuild the Chignik King salmon stocks (in terms of both fishery management and biology)?
7. Do you have anything else you would like to add about king/Chinook salmon?

APPENDIX C—CONVERSION FACTORS

The following table presents the conversion factors used in determining how many pounds were harvested of each resource surveyed. For instance, if respondents reported harvesting 3 individual sockeye salmon in study year 2014, the quantity would be multiplied by the appropriate conversion factor (in this case 4.9424) to show a harvest of 14.8 lb of sockeye salmon.

Resource name	Reported units	2014	2015	2016
		Conversion factor	Conversion factor	Conversion factor
Chum salmon	Individual	6.1669	4.8100	5.0313
Chum salmon	Gallons	6.0000	6.0000	
Chum salmon [CF retention]	Individual	6.1669	4.8100	5.0313
Chum salmon [CF retention]	Gallons	6.0000	6.0000	
Coho salmon	Individual	6.1791	4.7850	5.2330
Coho salmon	Gallons	6.0000	6.0000	
Coho salmon [CF retention]	Individual	6.1791	4.7850	5.2330
Coho salmon [CF retention]	Gallons	6.0000	6.0000	
Chinook salmon	Individual	7.9727	7.6212	5.4343
Chinook salmon	Gallons	6.0000	6.0000	
Chinook salmon [CF retention]	Individual	7.9727	7.6212	5.4343
Chinook salmon [CF retention]	Gallons	6.0000	6.0000	
Pink salmon	Individual	2.3618	2.1535	2.9242
Pink salmon	Gallons	6.0000	6.0000	
Pink salmon [CF retention]	Individual	2.3618	2.1535	2.9242
Pink salmon [CF retention]	Gallons	6.0000	6.0000	
Sockeye salmon	Individual	4.9424	4.0700	4.3836
Sockeye salmon	Gallons	6.0000	6.0000	
Sockeye salmon [CF retention]	Individual	4.9424	4.0700	4.3836
Sockeye salmon [CF retention]	Gallons	6.0000	6.0000	

Source ADF&G Division of Subsistence household surveys, 2015–2017.