

**Fishery Data Series No. 19-09**

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# **Subsistence Salmon Harvests in the Kuskokwim Area, 2016**

**Annual Report for Study 14-352  
USFWS Office of Subsistence Management  
Fisheries Resource Monitoring Program**

**by**

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**June 2019**

**Alaska Department of Fish and Game**

**Divisions of Sport Fish and Commercial Fisheries**



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<b>Weights and measures (metric)</b>		<b>General</b>		<b>Mathematics, statistics</b>	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H <sub>A</sub>
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	<i>e</i>
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, $\chi^2$ , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient (simple)	r
		corporate suffixes:		covariance	cov
<b>Weights and measures (English)</b>		Company	Co.	degree (angular)	°
cubic feet per second	ft <sup>3</sup> /s	Corporation	Corp.	degrees of freedom	df
foot	ft	Incorporated	Inc.	expected value	<i>E</i>
gallon	gal	Limited	Ltd.	greater than	>
inch	in	District of Columbia	D.C.	greater than or equal to	≥
mile	mi	et alii (and others)	et al.	harvest per unit effort	HPUE
nautical mile	nmi	et cetera (and so forth)	etc.	less than	<
ounce	oz	exempli gratia	e.g.	less than or equal to	≤
pound	lb	(for example)		logarithm (natural)	ln
quart	qt	Federal Information Code	FIC	logarithm (base 10)	log
yard	yd	id est (that is)	i.e.	logarithm (specify base)	log <sub>2</sub> , etc.
		latitude or longitude	lat or long	minute (angular)	'
<b>Time and temperature</b>		monetary symbols (U.S.)	\$, ¢	not significant	NS
day	d	months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	H <sub>0</sub>
degrees Celsius	°C	registered trademark	®	percent	%
degrees Fahrenheit	°F	trademark	™	probability	P
degrees kelvin	K	United States (adjective)	U.S.	probability of a type I error (rejection of the null hypothesis when true)	$\alpha$
hour	h	United States of America (noun)	USA	probability of a type II error (acceptance of the null hypothesis when false)	$\beta$
minute	min	U.S.C.	United States Code	second (angular)	"
second	s	U.S. state	use two-letter abbreviations (e.g., AK, WA)	standard deviation	SD
<b>Physics and chemistry</b>				standard error	SE
all atomic symbols				variance	
alternating current	AC			population	Var
ampere	A			sample	var
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				

***FISHERY DATA SERIES NO. 19-09***

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THE KUSKOKWIM AREA, 2016**

by

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# TABLE OF CONTENTS

	<b>Page</b>
LIST OF TABLES.....	ii
LIST OF FIGURES.....	ii
LIST OF APPENDICES.....	iii
ABSTRACT.....	1
INTRODUCTION.....	1
OBJECTIVES.....	3
METHODS.....	3
Study Design.....	3
The Survey Instrument.....	5
Harvest Calendars.....	6
Data Analysis.....	7
Harvest Estimation.....	7
Expanded Community Harvest.....	7
Harvest Estimation of Non-surveyed and Under-surveyed Communities.....	9
Total Kuskokwim Area Harvest.....	10
RESULTS.....	10
Household Selection and Survey.....	10
Harvest Estimates.....	11
Primary Fishing Gear.....	11
Estimated Fishing Households, Community Population Size, and Households Receiving Salmon.....	11
Subsistence Use of Salmon for Dog Food.....	12
Lost Fish.....	12
Subsistence Salmon Needs.....	12
Reported and Estimated Harvest of Non-salmon Species.....	13
Harvest Calendars.....	13
DISCUSSION.....	13
Harvest Estimates.....	13
Amounts Necessary for Subsistence.....	14
ACKNOWLEDGEMENTS.....	14
REFERENCES CITED.....	15
TABLES AND FIGURES.....	17
APPENDIX A: HISTORICAL SALMON HARVEST ESTIMATES.....	55
APPENDIX B: SURVEY INSTRUMENT.....	65
APPENDIX C: FISH MEASURES.....	69

## LIST OF TABLES

<b>Table</b>	<b>Page</b>
1 Kuskokwim Area communities by geographic location.....	18
2 Households selected and surveyed by user group, 2016. ....	19
3 Expanded harvest of Chinook salmon for communities surveyed, Kuskokwim Area, 2016.....	21
4 Expanded harvest of chum salmon for communities surveyed, Kuskokwim Area, 2016. ....	22
5 Expanded harvest of sockeye salmon for communities surveyed, Kuskokwim Area, 2016. ....	23
6 Expanded harvest of coho salmon for surveyed communities, Kuskokwim Area, 2016. ....	24
7 Expanded harvest of pink salmon for communities surveyed, Kuskokwim Area, 2016. ....	25
8 Total estimated subsistence salmon harvest by species and community for the Kuskokwim Area, 2016. ....	26
9 Estimated number of salmon retained from commercial fishing for subsistence use, Kuskokwim Area, 2016.....	28
10 Fishing gear reported as the primary type used by subsistence fishermen, Kuskokwim Area, 2016. ....	29
11 Estimated number of households that subsistence fished in communities surveyed, Kuskokwim Area, 2016.....	30
12 Estimated number of people living in communities surveyed, Kuskokwim Area, 2016.....	32
13 Number of fish reported as received from subsistence fisheries, Kuskokwim Area, 2016. ....	34
14 Number of fish reported as received from commercial fisheries, Kuskokwim Area, 2016.....	35
15 Number of fish reported as received from commercial fisheries, Kuskokwim Area, 2016.....	36
16 Number of salmon, by species reported as lost due to spoilage, animals, etc., Kuskokwim Area, 2016. ....	37
17 Comments provided by survey participants regarding the meeting of subsistence needs for Chinook salmon, 2016. ....	38
18 Comments provided by survey participants regarding the meeting of subsistence needs for Chum salmon, 2016. ....	40
19 Comments provided by survey participants regarding the meeting of subsistence needs for Sockeye salmon, 2016. ....	42
20 Comments provided by survey participants regarding the meeting of subsistence needs for Coho salmon, 2016. ....	44
21 Estimated harvest of non-salmon fish, including those caught in the winter prior to the survey season, Kuskokwim Area, 2016.....	46
22 Estimated harvest of non-salmon fish, including those caught in the winter prior to the survey season, Kuskokwim Area, 2016.....	47

## LIST OF FIGURES

<b>Figure</b>	<b>Page</b>
1 Kuskokwim Management Area.....	48
2 Historical subsistence harvest estimates of Chinook salmon in the Kuskokwim River. ....	48
3 Historical subsistence harvest estimates of Chinook salmon in the Kuskokwim River by sub-area. ....	49
4 Historical subsistence harvest estimates of Chinook salmon in the South Kuskokwim Bay by sub-area. ....	50
5 Historical subsistence harvest estimates of chum salmon in the Kuskokwim Area. ....	50
6 Historical subsistence harvest estimates of chum salmon in the Kuskokwim River by sub-area.....	51
7 Historical subsistence harvest estimates of sockeye salmon in the Kuskokwim Area. ....	52
8 Historical subsistence harvest estimates of coho salmon in the Kuskokwim Area. ....	52
9 Historical subsistence harvest estimates of sockeye salmon in the Kuskokwim River by sub-area.....	53
10 Historical subsistence harvest estimates of coho salmon in the Kuskokwim River by sub-area.....	54

# LIST OF APPENDICES

<b>Appendix</b>		<b>Page</b>
A1	Estimated number of Chinook salmon harvested for subsistence in the Kuskokwim area, 2006–2016.....	56
A2	Estimated number of chum salmon harvested for subsistence in the Kuskokwim area, 2006–2016. ....	58
A3	Estimated number of sockeye salmon harvested for subsistence in the Kuskokwim area, 2006–2016.....	60
A4	Estimated number of sockeye salmon harvested for subsistence in the Kuskokwim area, 2006–2016.....	62
B1	Kuskokwim Area postseason subsistence salmon harvest survey form, 2016. ....	66
C1	Approximate measures used to convert reported amounts of fish harvest, Kuskokwim Area, 2008– 2016.....	70





## ABSTRACT

The Alaska Department of Fish and Game (ADF&G) in partnership with Orutsararmiut Native Council (ONC) in Bethel conducted a voluntary survey program to estimate subsistence salmon harvest for the Kuskokwim Management Area in 2016. Harvest information was collected through postseason household interviews and harvest calendars. Simple random sampling and stratified random sampling techniques were used, based on community size and user group designations, to select households to be interviewed. For the community of Bethel, subsistence salmon harvest information was collected by ONC. ADF&G surveyed the remaining communities in the Kuskokwim Management Area. In 2016, Kuskokwim Area subsistence users were subject to Chinook salmon *Oncorhynchus tshawytscha*, harvest restrictions. Households were surveyed in 28 communities in the Kuskokwim Management Area, including most communities along the Kuskokwim River and all communities within south Kuskokwim Bay. Subsistence salmon harvest estimates in 2016 were 36,268 Chinook, 46,026 chum *O. keta*, 54,627 sockeye *O. nerka*, 39,388 coho *O. kisutch*, and 4,527 pink salmon *O. gorbuscha*.

Key words: Chinook salmon *Oncorhynchus tshawytscha*, chum salmon *Oncorhynchus keta*, coho salmon *Oncorhynchus kisutch*, and pink salmon *Oncorhynchus gorbuscha*, subsistence, harvest, Bethel, Aniak, Kuskokwim River, Kuskokwim Bay, Kuskokwim Area

## INTRODUCTION

The purpose of this study was to quantitatively estimate the subsistence harvest of salmon, by species, in the Kuskokwim Management Area (KMA) using postseason subsistence salmon harvest surveys. This study was a continuation of the *Kuskokwim Area subsistence salmon monitoring program* (Monitoring Program). Data were collected about the number and species of salmon harvested by area residents and analyzed to provide an estimate of the number of salmon harvested for subsistence purposes in the KMA during the 2016 fishing season.

The Kuskokwim Management Area (Figure 1) subsistence salmon fishery is one of the largest in Alaska in terms of the number of residents who participate and the number of salmon harvested (Fall et al. 2014). Residents harvest all 5 locally occurring species of Pacific salmon for subsistence purposes: Chinook *Oncorhynchus tshawytscha*, chum *O. keta*, coho *O. kisutch*, sockeye *O. nerka*, and pink *O. gorbuscha* salmon. Between 2010 and 2014, the Alaska Department of Fish and Game (ADF&G) Division of Subsistence conducted comprehensive subsistence harvest and used surveys in 23 Kuskokwim Area communities. The results indicated that on average salmon contributes 40% of the total wild resource harvest (in edible pounds) in the Lower Kuskokwim communities from Eek to Tuluksak, 65% in the Central Kuskokwim communities from Lower Kalskag to Stony River, and 25% in the Upper Kuskokwim communities from McGrath to Nikolai (Brown et al. 2012, 2013; Ikuta et al. 2014; Ikuta and Koster 2012; Ikuta et al. 2016). Primary gear types used to harvest salmon include drift gillnets, set gillnets, rod and reel (Hensel 1996), and dip nets were recently reintroduced as a tool for Chinook salmon conservation because of the ability to live release those fish.

Subsistence salmon harvest practices represent a complicated dynamic between culture, tradition, salmon biology, and local economy (Ikuta et al. 2013; Simon et al. 2007). Salmon harvest typically occurs June through October and is often accompanied by the movement of families from permanent winter residences to summer fish camps situated along tributaries, sloughs, and along main river channels. During these months, daily activities of many KMA households revolve around subsistence fishing.

There are 38 communities traditionally recognized in the KMA and 29 villages have typically been targeted for annual surveys, based on logistics and voluntary involvement in the study (Table 1; Figure 1). On average, from 2006 to 2015, 78% of the Kuskokwim Area subsistence

salmon harvest (all species combined) occurred in the Lower Kuskokwim River villages from Eek to Tuluksak (Appendices A1–A4). The Middle Kuskokwim River villages from Lower Kalskag to Chuathbaluk harvested an average of 10% of the total subsistence salmon between 2006 and 2015. The Upper Kuskokwim River communities harvested about 6% of the total, South Kuskokwim Bay communities harvested 6% of the total harvest, and North Kuskokwim Bay communities harvested an average of 2% of the total harvest between 2006 and 2015 (Appendices A1–A4). The harvest distribution was similar to the human population distribution along the Kuskokwim River. In 2016, the population percentages calculated were Lower (80%), Middle (8%), and Upper (5%) Kuskokwim River communities, South Kuskokwim Bay communities (4%), and Kongiganak on north Kuskokwim Bay (3%) (Shelden et al. 2015).

The North Kuskokwim Bay communities of Kwigillingok, Kongiganak, and Kipnuk are not located on the Kuskokwim River, but some subsistence salmon fishing households from these communities have traveled to the Kuskokwim River to fish, in addition to fishing in areas closer to their communities (Fall et al. 2014). The villages of the North Kuskokwim Bay have consistently declined to be surveyed and the last to participate (Kongiganak) has not been surveyed since 2011 (Shelden et al. 2014).

The South Kuskokwim Bay communities of Quinhagak, Goodnews Bay, and Platinum, harvest salmon primarily from the Kanektok, Arolik, and Goodnews River drainages (Simon et al. 2007). South Kuskokwim Bay communities have consistently participated in Kuskokwim Area subsistence surveys (Appendices A1–A4).

Subsistence users from Bering Sea coastal communities have not participated in the ADF&G Monitoring Program most years. These include the communities of Mekoryuk (on Nunivak Island), Newtok, Tununak, Toksook Bay, Nightmute, and Chefornak; and typically these communities harvest salmon from coastal waters and rivers close to these communities (Simon et al. 2007; Wolfe et al. 2012).

At the time of this study, ADF&G has not required subsistence fishermen in the KMA to report their harvest and permits have not been required to participate in the subsistence fishery. Prior to 2010, except in special management areas (e.g., Aniak River), subsistence fishing in the KMA was largely unrestricted. Since 2014, the Federal Subsistence Board has responded to requests from communities, to close waters bordering federal land in the Kuskokwim drainage to the harvest of Chinook salmon by non-federally qualified subsistence users. The U.S. Fish and Wildlife Service (USFWS) then restricted subsistence fishing opportunity for Chinook salmon due to conservation concerns within federally managed waters.

Under state regulation, legal subsistence fishing gear includes gillnet, beach seine, rod and reel, fish wheel, and spear (5 AAC 01.270). In 2014, the Alaska Board of Fisheries approved the use dip nets in the Kuskokwim River during Chinook salmon conservation (5 AAC 01.270).

Annual documentation of the subsistence salmon harvest is necessary to determine whether salmon are returning in sufficient numbers to KMA rivers to meet escapement and subsistence needs. Since 1960, the subsistence monitoring program has estimated salmon harvest primarily through household surveys and to a lesser extent harvest calendars and postcard surveys. This information has been used by ADF&G, USFWS, the Alaska Board of Fisheries (BOF), and the Federal Subsistence Board to manage and provide reasonable opportunity for continued customary and traditional uses of salmon throughout the region. In 2013, using the results from the postseason subsistence salmon survey, the BOF revised the recognized amounts of salmon

reasonably necessary for subsistence (ANS) in the Kuskokwim river drainage based on ranges of recorded harvests of salmon in years of unrestricted subsistence harvest. These revised ranges are 67,200–109,800 Chinook, 41,200–116,400 chum, 32,200–58,700 sockeye, 27,400–57,600 coho, and 500–2,000 pink salmon (5 AAC 01.286b). A species-specific ANS range provides an index of the extent to which reasonable opportunity was provided in each subsistence fishery.

The BOF also revisited the ANS findings for the remainder of the KMA. For the south Kuskokwim Bay communities of Quinhagak, Goodnews Bay, and Platinum, the BOF found an ANS of 6,900–17,000 salmon (not broken down by species). For the remaining KMA communities, located along the Bering Sea coast, ANS are harder to determine, but available data document an annual use of 12,500–14,400 salmon (not broken down by species) (Wolfe et al. 2012).

The goal of the survey is to provide a reliable annual estimate of subsistence salmon harvest in the KMA, primarily as a management tool. Questions are designed to determine total subsistence harvest of salmon regardless of the eventual use. Estimates include fish harvested to feed dogs, fish discarded due to being unfit for human consumption, and fish given away as part of traditional sharing practices, in addition to those consumed by the fishing household. The data collected during this survey serve fisheries managers by expanding their ability to assess annual run strength of various salmon species, forecast the strength and age composition of future runs, set preseason management plans, and develop long term management plans, including escapement goals. These data also help managers assess subsistence needs and identify whether harvestable surpluses will be available for subsistence, commercial, and sport fishing uses (Poetter and Tiernan 2017).

## **OBJECTIVES**

The objectives of this study were as follows:

1. Estimate the number of Chinook, chum, sockeye, coho, and pink salmon harvested for subsistence uses by subsistence fishermen in 28 communities within the KMA;
2. Document gear types used by KMA subsistence fishermen;
3. Estimate fishing households, community population size, and households receiving salmon;
4. Document the number of dogs within KMA communities and salmon fed to dogs;
5. Document household responses relating to meeting of subsistence salmon needs in surveyed communities; and
6. Document reported harvest of non-salmon fish species among fishermen in the KMA.

## **METHODS**

### **STUDY DESIGN**

In 2016, household surveys were attempted in 28 of the 38 communities within the KMA, including most communities along the Kuskokwim River and all communities within South Kuskokwim Bay. The village of Kongiganak in the North Kuskokwim Bay declined to participate in the surveys between 2012 and 2015 and was not attempted in 2016. The village of Telida was not attempted because it appears to be a seasonally occupied location with no year round residents. Except in Bethel (simple random sample), the postseason subsistence harvest survey was designed based on stratified random survey methodology (Scheaffer et al. 1999). In

this survey design, each household was the primary sampling unit. A household generally consists of 1 or more people living together in a dwelling and sharing the same mailing address. Multiple generations living in 1 dwelling would be considered a single household. Each household was classified into 1 of 5 strata based on the household's recent harvest history. The 5 stratifications of participation in the subsistence fishery are as follows:

- High harvester: a household that has averaged a harvest of more than 200 salmon per year;
- Medium harvester: a household that has averaged a harvest of 101–200 salmon per year;
- Light harvesters: a household that has averaged a harvest of 1–100 salmon per year;
- Usually does not fish: a household that did not participate in subsistence fishing activities; and
- Unknown: a household that has no harvest record within any of the past 5 years.

For this study, a fishing household was defined as a household that participated in subsistence fishing activities, such as harvesting or processing salmon. The household stratification was updated prior to the survey and was not re-assigned during the survey year (i.e., no post-survey reclassification), with the exception of unknown fishing households. From each stratum, survey households were selected randomly in the following percentages:

- Heavy harvester: 100%;
- Medium harvester: 100%;
- Light harvester: 50%;
- Usually do not fish: 30%; and
- Unknown: 100%.

When the number of households in each stratum was less than 10 households, all households in the stratum were surveyed. Likewise, when the total number of households in a community was less than or equal to 40, all households in the community were surveyed and the survey method became a census (100% surveyed). In Aniak, the survey method was also a census in an attempt to increase the precision of estimates from this larger community.

In Bethel, approximately 25% of the random survey was conducted based on simple random survey methodology, where each dwelling (physical location instead of household) was the primary sampling unit. Because Bethel is a main hub community of western Alaska, its population is highly fluid and a high proportion of the population move in and out of Bethel on a regular basis. In addition, people often change dwellings, making it difficult to maintain an accurate and complete household list. A dwelling list for Bethel has been maintained and updated annually. Dwelling maps are developed from maps provided by the Bethel city planner's office. Map and list are compared and updated both prior to the season and inseason based on surveyor notes. Based on the updated list, about 25 occupied dwellings were randomly selected for survey per surveyor each day, 5 days a week. For each selected dwelling, at least 3 separate attempts to contact the household were required. Attempts were made on separate days and different times of day with at least 1 visit made after 5:00 PM. Surveyors could visit a dwelling more than 1 time each day and all of the visits were considered 1 daily attempt. Exceptions included an obviously abandoned or derelict dwelling or when contact was made and the occupant declined to be surveyed. In these cases, the selected dwelling was dropped from the survey and replaced by another dwelling selected at random from those not previously selected. Progress of the survey in Bethel was tracked daily by monitoring mean and standard deviation of

harvest per household. The survey continued until total surveyed selected households reached about 25% of the occupied dwellings, or mean and standard deviation of harvest become stabilized enough to suggest confidence in survey estimates.

Postseason subsistence harvest surveys were conducted in early autumn because the majority of salmon fishing was finished, yet fishermen could still recall their harvest numbers because the season had ended recently. In Bethel, surveys were conducted by Orutsararmiut Native Council (ONC), and the other communities were surveyed by ADF&G. A cash prize drawing for participants was offered to incentivize participation in the salmon survey.

Before conducting interviews, all surveyors (including ONC surveyors) were trained in surveying techniques, including direction about how to get the best information possible from people who are not accustomed to quantifying their fish harvest. Surveyors were trained in salmon species name identification, because local names for salmon vary throughout the drainage. The surveyors were also briefed about fishery issues or concerns from the recent subsistence and commercial salmon fishing season, to improve understanding of community members' reactions and comments during surveys.

During the survey, the crew contacted community officials to notify them about the project and solicit support before arriving in the community to conduct surveys. The household lists were annotated and corrected as the surveyors completed the survey process in the community. During interviews, both surveyors and surveyed individuals contributed to the quality of the estimate. Surveyors were responsible to attempt contact with each selected household, ask questions consistently and understandably, and foster a cooperative atmosphere. Surveyors attempted to interview a member of each selected household, preferably the primary harvester. Surveyors sought out translators for those respondents who did not speak English as a primary language. Occasionally, interviews were conducted with households not pre-selected for the survey. Those households were either 1) new or previously unknown households found by surveyors, or 2) voluntarily provided surveyors with their harvest information.

All survey data were entered into the ADF&G subsistence harvest database, and harvest estimates were generated for the KMA. All subsistence harvest data were treated as confidential, such that individual harvest data were not shared and all analysis was aggregate and anonymous. The study was generally conducted in accordance with the Alaska Federation of Natives' "Guidelines for Research" (AFN 2015).

## **THE SURVEY INSTRUMENT**

The survey instrument remains largely the same as previous years and the survey was conducted the similar to 2015 (Appendix B1). Most interview questions were designed to provide a quantitative assessment of each household's subsistence salmon harvest. A fishing household was identified by Question 3, which asked whether anyone in the household harvested salmon for subsistence use or kept fish for subsistence from the commercial fishery (Appendix B1). The surveyor was instructed to clarify that harvest includes any participation in the subsistence fishery, such as cutting fish. Household harvest included salmon that members of the household gave away, ate fresh, fed to dogs, or lost to spoilage. To avoid double-counting between households, salmon received from other households (outside the fishing group) were not considered part of the household harvest because they were part of the harvest of the household that gave the fish.

Individual household harvest forms the basis of salmon harvest estimates for this study; therefore, an effort was made to differentiate group harvest (several households fishing with, or helping, others) from individual household harvest to prevent bias. Households were asked about their harvest activities and whether they participated in group harvests or fished alone (Question 5 and 6). If surveyors identified a group harvest, they followed up by asking what portion of the group harvest the individual household had kept for itself (Question 7). This helped to prevent the possibility that a single large harvest might be reported by more than 1 member household of the fishing group defined in Question 5. (All questions can be found in Appendix B1.)

Households were also asked whether they had given salmon to other families (outside of the fishing group), or whether they had received salmon from other subsistence households (outside of the work group), from a commercial fisherman, or from a test fishery project. Households were also asked how many salmon were harvested for dog food.

Fishermen who did not know the actual number of fish harvested occasionally reported harvest in alternative terms, such as the number of 5 gallon buckets, plastic bags, gunny sacks, or pounds. ADF&G devised a conversion sheet to estimate fish numbers in these circumstances (Appendix C1).

Assessment of whether a household's subsistence needs were met, for fishing and non-fishing households, was attempted by asking respondents if they had met their subsistence needs for each species of salmon. Possible answers were 'yes' (needs met), 'no' (needs not met), or 'no need'. Respondents who reported that they did not meet their needs were asked to further describe why their needs were not met for that species. Responses were divided into 2 categories for analysis: households that participated in salmon harvest and households that did not participate in salmon harvest. For the purposes of this analysis, responses from the second group were not included. These households would probably receive salmon later in the year, so an assessment of harvest needs and success would be premature at the time of the surveys.

After the households were interviewed, survey forms were reviewed. During this process, forms from fishing group members were compared to identify discrepancies. Follow-up calls were made to try to settle major discrepancies. Occasionally, fishing group members simply did not agree on numbers for salmon harvest. In this event, ADF&G staff made a judgment about how to best represent the fish harvest on the appropriate survey forms, and priority was always given to ensuring the accuracy of the household harvest over the group harvest. Data from all surveys were checked and key-entered into the subsistence database. Each record was then rechecked by a different individual to assure accuracy.

## **HARVEST CALENDARS**

In addition to household harvest survey, subsistence salmon harvest calendars were distributed in late April or early May each year by mass mailing to households identified as those who usually fish to ensure they were available to fishermen prior to the start of the salmon fishing season. The calendar has been helpful to examine subsistence harvest timing and helps fishermen keep track of their daily salmon harvest for reference during postseason surveys.

Extra calendars were kept at the Bethel ADF&G office for distribution as needed or upon request. In an effort to increase the use and return rate of subsistence calendars, public service announcements were broadcast on local radio stations inseason to remind fishermen to keep calendars up-to-date and the importance of calendars to document subsistence use. Flyers

describing the importance of subsistence calendars and the postseason subsistence survey project were also distributed to local communities to post in public places such as council offices, local stores, and post offices.

Data from the returned calendars are not normally used to directly generate KMA harvest estimates. Because harvest calendars may contain harvest information from 1 or multiple households, data from returned calendars were not used to compare or complete harvest surveys. However, on occasion a survey respondent would instruct surveyors to take harvest numbers directly from a calendar, either returned during the survey or mailed in prior to the survey.

## DATA ANALYSIS

### Harvest Estimation

#### *Expanded Community Harvest*

Subsistence salmon harvest reported by sampled households was expanded to estimate total community harvest, by species, using a stratified random sampling expansion technique (Scheaffer et al. 1999). The stratified expansion procedure was performed for a community only if a sufficient number of households were sampled.

For harvests of each stratum, if 10 or fewer households were surveyed, and the proportion of surveyed households was less than 0.25 (for non- and light harvesters) or 0.3 (for other strata), then harvest expansion was not conducted. For estimates of community harvest, if the total number of surveyed households in each stratum was less than 50 and the proportion of surveyed households was less than 0.3, total community harvest was not estimated using this method.

Denote that

$N_{kj}$  is the number of households in the stratum ( $j = 5$ : unknown, usually do not harvest, light harvest, medium harvest, and heavy harvest) of the community ( $k$ );

$n_{kj}$  is the number of surveyed households in the stratum of the community ( $k$ );

$y_{kji}$  is the response of surveyed household ( $i$ ) ( $i = 1 \dots n_{kj}$ ) in the stratum ( $j$ ) of the community ( $k$ ); e.g., the number of fish harvested by a household.

Mean household response in the stratum of the community ( $\bar{y}_{kj}$ ) was calculated as:

$$\bar{y}_{kj} = \frac{\sum_{i=1}^{n_{kj}} y_{kji}}{n_{kj}} . \quad (1)$$

Standard error of mean household response ( $SE_{kj}$ ) was calculated as:

$$SE_{kj} = \sqrt{\frac{s_{kj}^2}{n_{kj}} \left( \frac{N_{kj} - n_{kj}}{N_{kj}} \right)} \text{ where } s_{kj}^2 = \frac{\sum_{i=1}^{n_{kj}} (y_{kji} - \bar{y}_{kj})^2}{n_{kj} - 1} . \quad (2)$$

The estimate of total harvest of the community ( $\hat{T}_k$ ) was calculated as:

$$\hat{T}_k = \sum_{j=1}^5 N_{kj} \bar{y}_{kj}. \quad (3)$$

The 95% confidence interval of total community harvest (95% CI<sub>k</sub>) was calculated as:

$$95\% \text{ CI}_k = t_{(0.025, df=n-1)} \cdot \sqrt{\hat{V}(T_k)} \quad \text{where} \quad \hat{V}(T_k) = \sum_{j=1}^5 N_{kj}^2 \left( \frac{N_{kj} - n_{kj}}{N_{kj}} \right) \left( \frac{s_{kj}^2}{n_{kj}} \right). \quad (4)$$

When a single stratum was not surveyed, total harvest of a community ( $\hat{T}_k$ ) was calculated as:

$$\hat{T}_k = \left( \frac{\sum_{j=1}^5 N_{kj}}{\sum_{j=1}^4 N_{kj}} \right) \sum_{j=1}^4 N_{kj} \bar{y}_{kj}. \quad (5)$$

The 95% confidence interval of total community harvest when a single stratum was not surveyed (95% CI<sub>k</sub>) was calculated as:

$$95\% \text{ CI}_k = t_{(0.025, df=n-1)} \cdot \sqrt{\hat{V}(T_k)} \quad \text{where} \quad \hat{V}(T_k) = \left( \frac{\sum_{j=1}^5 N_{kj}}{\sum_{j=1}^4 N_{kj}} \right)^2 \sum_{j=1}^4 N_{kj}^2 \left( \frac{N_{kj} - n_{kj}}{N_{kj}} \right) \left( \frac{s_{kj}^2}{n_{kj}} \right). \quad (6)$$

The above methods were used to estimate salmon harvests (Question 7) and the number of people (Question 2).

To estimate the number of subsistence fishing households in each community, the following expansion method was used:

Denote that

$n_{kj(s)}$  is the number of surveyed households that subsistence fish in the stratum ( $j$ ) of the community ( $k$ ); and

$n_{kj}$  is the number of surveyed households in the stratum ( $j$ ) of the community ( $k$ ).

Then, the proportion of households who subsistence fish in the stratum ( $j$ ) of the community ( $k$ ) ( $\hat{p}_{kj(s)}$ ) was calculated as:

$$\hat{p}_{kj(s)} = \frac{n_{kj(s)}}{n_{kj}}. \quad (7)$$

Estimated number of households that subsistence fish in the community ( $\hat{N}_{k(s)}$ ) was calculated as:

$$\hat{N}_{k(s)} = \sum_{j=1}^5 N_{kj} \hat{p}_{kj(s)}. \quad (8)$$



The 95% confidence interval (95% CI<sub>k</sub>) was calculated as:

$$95\% \text{CI}_k = t_{(0.025, df=n-1)} \cdot \sqrt{\hat{V}(\hat{N}_{k(s)})} \quad \text{where } \hat{V}(\hat{N}_{k(s)}) = \sum_{j=1}^5 N_{kj}^2 \left( \frac{N_{kj} - n_{kj}}{N_{kj}} \right) \left( \frac{\hat{P}_{kj(s)}(1 - \hat{P}_{kj(s)})}{n_{kj} - 1} \right) \quad (9)$$

### ***Harvest Estimation of Non-surveyed and Under-surveyed Communities***

Harvests of several communities were not estimated some years because surveys were not conducted or survey data were insufficient. Harvests of those communities were estimated by employing a Bayesian hierarchical multiple imputation method (Honaker and King 2010; King et al. 2001). In this method, we assumed that events that cause missing harvest data follow a missing at random process (MAR); and harvest data possess multivariate normal distribution.

Under these conditions, the harvest in a given year and community can be estimated from the harvest estimates of that community in previous years and harvest estimates of surrounding communities during the same time period. For instance, the 2008 harvest of the community of Tuntutuliak (un-surveyed in that year) was estimated using its known harvests during 1990–2007 and harvests of other Lower Kuskokwim communities during the entire period (1990–2008). This estimation method only applies to communities with several years of annual harvest estimates. It is further based on assumptions that fishing characteristics of communities (e.g. proportion of fishing households, demand, and effort) are constant over time, and changes in average household harvests are primarily due to abundance of fish or fishing regulations affecting all communities. Communities were grouped according to geographic subareas within the KMA, on the assumption that harvests within each subarea would be more similar than harvests in other subareas. The 4 geographic subareas were: 1) Lower Kuskokwim River and Kongiganak; 2) Middle Kuskokwim River; 3) Upper Kuskokwim River; and 4) South Kuskokwim Bay.

For communities ( $K$ ) within a given geographic subarea, let  $D_{kj,obs}$  denote the observed data (average harvest per household) for community ( $k$ ) ( $k = 1, \dots, K$ ) in year ( $j$ ). In application, the average household harvest  $D_{kj,obs}$  was the log-transformed average household harvest,  $D_{kj,obs}$  was  $\log(T_{kj}/N_{kj} + I)$ , where  $T_{kj}$  was the total community harvest and  $N_{kj}$  was the total number of households in community ( $k$ ) during year ( $j$ ).

Assuming that the  $D_{kj,obs}$  arose from an underlying multivariate normal distribution in which  $\boldsymbol{\mu}_K$  is a vector of mean annual household harvest in the  $K$  communities within the subarea and  $\boldsymbol{\Sigma}$  is a  $K \times K$  covariance matrix:

$$D_{kj,obs} \sim \mathbf{N}(\boldsymbol{\mu}_K, \boldsymbol{\Sigma}) \quad (10)$$

In the Bayesian hierarchical model, further assume that  $\boldsymbol{\mu}_K$  and  $\boldsymbol{\Sigma}$  arose from some other unknown distribution. We assigned a normal prior distribution for  $\boldsymbol{\mu}_K$ , with mean  $\mu$  and variance  $\sigma^2$ , and a Wishart distribution with  $K \times K$  dimensions for  $\boldsymbol{\Sigma}$ :

$$\begin{aligned} \boldsymbol{\mu}_K &\sim N(\mu, \sigma^2) \\ \boldsymbol{\Sigma} &\sim W(I_K, K) \end{aligned} \quad (11)$$

Then, the posterior distributions for  $\mu_K$  and  $\Sigma$  were derived as:

$$\tilde{\mu}_K, \tilde{\Sigma} \sim P(\mu_K, \Sigma | D_{kj.obs}) \quad (12)$$

A predicted value for missing data,  $D_{kj.mis}$ , was derived from random draws from the posterior distribution for  $\mu_K$  and  $\Sigma$ ,

$$\tilde{D}_{kj.mis} \sim P(D_{kj.mis} | D_{kj.obs}, \tilde{\mu}_K, \tilde{\Sigma}) \quad (13)$$

The Bayesian estimation used WinBUGS 1.4.3 (Lunn et al. 2000), with default initial values. A total of 55,000 imputations were generated (after discarding 5,000 initial burn-in iterations) and the mean value of these imputations was calculated. The resulting mean household harvest was back-transformed and multiplied by the number of households in the community that year to estimate the unknown total community harvest. Total community harvest was calculated as:

$$\tilde{T}_{kj} = N_{kj} \exp(\tilde{D}_{kj.mis}) \quad (14)$$

and its 95% confidence interval was estimated as:

$$95\% \text{ CI} = N_{kj} \exp\left(1.96 \cdot \sqrt{V(\tilde{D}_{kj.mis})}\right) \quad (15)$$

where  $V(\tilde{D}_{kj.mis}^*)$  is the standard deviation of the Bayesian estimate. Estimation of missing data within a given subarea was independent of estimates in other subareas.

### ***Total Kuskokwim Area Harvest***

Total number of salmon harvested in the Kuskokwim Area ( $\hat{T}$ ) was estimated by summing harvest estimates of all communities (across all geographic subareas):

$$\hat{T} = \sum_{k=1} \hat{T}_k \quad (16)$$

and its 95% confidence interval (95% CI) was calculated as:

$$95\% \text{ CI} = t_{(0.025, df=n-1)} \cdot \sqrt{\hat{V}(T)} \quad \text{where} \quad \hat{V}(T) = \sum_{k=1} \hat{V}(T_k) \quad (17)$$

## **RESULTS**

### **HOUSEHOLD SELECTION AND SURVEY**

In 2016, project surveyors visited and successfully surveyed 28 of 29 targeted communities (Table 2; Appendix A). Within the 28 targeted communities, a total of 1,947 households were selected for survey. Of these, 1,791 were contacted along with 222 households that were non-selected or previously unknown. Together these 1,829 households represent a survey of 44% of Kuskokwim Area households. Of the preselected households 184 refused the survey (Table 2).

## **HARVEST ESTIMATES**

In 2016, survey results were stratified and expanded for each community (Tables 3–7). The salmon harvests for Kongiganak and Telida (not surveyed in 2016) would normally have been estimated using Bayesian methods previously described. However, these villages have not been successfully visited often or consistently enough to provide a useful estimate via this method and therefore not estimated in 2016 (Appendix A1–A4).

The total estimated Chinook salmon harvest by species in the KMA (in communities for which estimates could be made) was 36,268 (95% CI +/- 2,710). Estimates for other salmon species, based solely on subsistence surveys, were 46,026 (95% CI +/- 5,252) chum, 54,627 (95% CI +/-5,490) sockeye, 39,388 (95% CI +/- 5,325) coho, and 4,527 (95% CI +/- 1,163) pink salmon (Table 8). Overall, approximately 180,836 salmon were harvested for subsistence use in 2016 (Table 8).

Harvest estimates for households that participate in commercial fishing included salmon retained for subsistence use from that activity. Historically salmon retained from commercial fishing were most commonly reported in the areas within or adjacent to commercial fishing districts, such as North and South Kuskokwim Bay and the Lower Kuskokwim River (Table 9). In 2016, there were no large scale commercial fish buyers present in the KMA and no major commercial fishing opportunities provided (Table 9).

## **PRIMARY FISHING GEAR**

In 2016, most surveyed households reported drift gillnets as the primary gear used to subsistence fish in the KMA and 1,796 households of the 1,836 households surveyed reported drift gillnets as the primary harvest method (Table 10). Gear type estimates were not expanded.

## **ESTIMATED FISHING HOUSEHOLDS, COMMUNITY POPULATION SIZE, AND HOUSEHOLDS RECEIVING SALMON**

In 2016, an estimated 2,160 households participated in the subsistence fishery for salmon (Table 11). The total estimate of people living in surveyed communities of the KMA was 14,914 (Table 12).

In Kuskokwim River subsistence activity, sharing of subsistence catch is a traditional practice. Sharing is here defined as the immediate distribution (giving or receiving) of salmon, upon harvest, to households outside of one's subsistence salmon harvest and processing work group. In 2016, based on answers provided, an estimated 3,754 (95% CI +/- 513) Chinook, 3,862 (95% CI +/- 1,146) chum, 4,365 (95% CI +/- 494) sockeye, 4,679 (95% CI +/- 600) coho, and 235 (95% CI +/- 130) pink salmon were shared by subsistence fishermen with other community members (Table 13). In 2016, no fish were reported as shared between commercial fishermen and other area residents (Table 14).

In 2016, there were 2 test fisheries and sonar apportionment gillnetting conducted in the KMA; the long running Bethel test fishery conducted by ADF&G, and a test fishery near Aniak conducted by Napaimute traditional council. Both test fisheries donated caught salmon to local communities. The Bethel test fishery reported catches of 522 Chinook, 2,078 chum, 1,187 sockeye, 1,917 coho, and 418 pink salmon, most of which were distributed to residents in Bethel, Kwethluk, Napaskiak, Eek, and Red Devil in cooperation with ONC (Poetter et al. 2017). It is unclear exactly how many fish of each species were distributed to each village or whether other

villages were involved. The Aniak test fishery reported catches of 337 Chinook, 632 chum, and 49 sockeye salmon, and most fish were distributed within the village of Aniak (Dan Gillikan, Biologist, Napaimute Village Council; personal communication). Kuskokwim River sonar reported catches of 2 Chinook, 42 chum, 135 sockeye, 2 coho and 2 pink salmon, and most salmon were distributed to the community of Kwethluk and fish camps located near the sonar site.

## **SUBSISTENCE USE OF SALMON FOR DOG FOOD**

In 2016, 2,269 respondents reported owning a combined total of 5,216 dogs. The number of households that reported feeding whole salmon to dogs was 1,807, and among these households an estimated 202 Chinook, 6,883 sockeye, 7,142 chum, 9,490 coho, and 710 pink salmon were fed to dogs (Table 15).

## **LOST FISH**

In 2016, 2,013 respondents reported 4,725 salmon as lost (e.g., not edible due to spoilage, animals, etc.; Table 16). Out of the 178 households that provided a reason for losing fish, 125 reported weather-related reasons (e.g., rain, moldy, flies, spoiled), 5 reported animals (e.g., bears, birds, otters), 21 reported disease, and 11 reported human theft (Table 16).

## **SUBSISTENCE SALMON NEEDS**

In 2016, 304 respondents reported that they did not have a need for Chinook salmon. Of those that reported a need for this species, 628 respondents met their needs (Table 17). Of the 879 respondents who provided a reason for not meeting their needs, 534 indicated non-fishery related factors such as age, difficulties with equipment, the high price of fuel, work conflicts, or having given away too many of the fish they harvested. A total of 47 respondents cited natural conditions including run dynamics (low abundance, timing of the run), river conditions (flooding, clarity, debris load), and inclement weather. A total of 198 of respondents cited fisheries management decisions as the reason they did not meet their needs. A total of 12 reported intentionally abstaining for conservation reasons. A total of 3 respondents reported human theft or animal interference (bears, birds, etc.) as reasons for not meeting their needs (Table 17).

In 2016, 534 of respondents stated that they do not generally fish for chum salmon. Of those that reported a need for this species, 647 met their needs (Table 18). Of the 622 respondents that did not meet needs for chum salmon, 433 cited non-fishery related reasons and 28 cited natural conditions similar to those previously mentioned. A total of 86 of respondents cited fisheries management decisions as the reason they did not meet their needs. The remaining respondents reported animal and human interference as reasons for not meeting their needs (Table 18).

In 2016, 338 of respondents stated that they do not generally fish for sockeye salmon. Of those that reported a need for this species, 740 met their needs (Table 19). Of the 725 respondents that indicated needs not met for sockeye salmon, 498 cited non-fishery related reasons and 41 cited natural conditions similar to those previously mentioned. A total of 97 respondents cited fisheries management decisions as the reason they did not meet their needs. The remaining respondents reported animal and human interference as reasons for not meeting their needs (Table 19).

In 2016, 452 of respondents stated that they do not generally fish for coho salmon. Of those that reported a need for this species, 588 met their needs (Table 20). Of the 757 respondents that did

not met their needs for coho salmon, 559 cited non-fishery related reasons and 53 cited natural conditions similar to those previously mentioned. A total of 58 respondents cited fisheries management decisions as the reason they did not meet their needs (Table 20).

## **REPORTED AND ESTIMATED HARVEST OF NON-SALMON SPECIES**

In 2016, estimates for the harvest of non-salmon species were expanded similar to salmon. Based on these estimates, the most heavily harvested species in the KMA appear to be blackfish (*Dallia pectoralis*) and smelt (*Osmerus mordax*). These species were each harvested in numbers that compared to all salmon combined: 164,498 (95% CI +/- 42,616) blackfish and 198,608 (95% CI +/- 20,923) smelt, versus 180,836 total salmon (Tables 8 and 22).

After blackfish, salmon, and smelt, the most heavily harvested species were northern pike (*Esox lucius*) with 98,466 (95% CI +/- 11,843). Pike were harvested in numbers comparable to chum, sockeye, and coho salmon (Tables 4, 8, and 21). All other species were harvested in numbers less than half those of northern pike (Tables 21 and 22).

Non-salmon species were most heavily harvested in the Lower Kuskokwim River. Only Arctic grayling (*Thymallus arcticus*) and Arctic char/Dolly Varden (*Salvelinus alpinus* and *S. malma*) were more heavily harvested in areas other than the Lower Kuskokwim River. Char were harvested most among South Kuskokwim Bay communities, and grayling were harvested most among Upper Kuskokwim River communities (Table 22).

## **HARVEST CALENDARS**

In 2016, households returned a total of 126 subsistence harvest calendars (approximately 6% of total issued). Additional incentives were offered by ADF&G in an effort to boost return rates.

# **DISCUSSION**

## **HARVEST ESTIMATES**

The 2016 subsistence harvest of Chinook salmon was estimated to have been below the 5-year average harvest (45,584) but greater than 2014 and 2015 harvest estimates (Figures 2 and 3; Appendix A1). All sections of the Kuskokwim River reported this trend in 2016 (Figure 2; Appendix A1). South Kuskokwim Bay communities have shown some variation in Chinook salmon harvest over the last several years and 2016 was the largest Chinook harvest estimate since 2007 (Figure 4). The North Kuskokwim Bay community of Kongiganak has not been visited since 2011, and lack of recent data prevents an accurate estimation.

In 2016, the total harvest of chum salmon was below the 5-year average harvest (61,262) (Appendix A2). The shift in harvest from Chinook to chum salmon observed in response to heavy restriction of Chinook salmon harvest in 2012 and 2014 did not appear in 2016 (Figure 5). This was apparent in each of the 3 areas of the Kuskokwim River (Figure 6).

The total harvest of sockeye and coho salmon in the KMA in 2016 was above the recent 5-year average for both species (46,345 and 36,255, respectively) (Figure 7 and 8; Appendices A3 and A4). The reported harvest of sockeye salmon from Upper Kuskokwim River communities has been below the 10-year average since 2010 (Figure 9; Appendix A3). Middle Kuskokwim River communities experienced a substantial increase of sockeye salmon harvest in 2016, probably related to the increased use of fish wheels by dog mushers in the community of Aniak (Figure 9; Appendix A3). Lower River communities harvested sockeye salmon in numbers slightly above

both the 5-year (35,815) and 10-year (35,121) averages (Figure 9; Appendix A3). Coho salmon subsistence harvests in the middle Kuskokwim River villages were third highest on record after 2014 and 2015, suggesting that coho salmon harvest was more important among those communities than in other areas, particularly in Aniak where dog mushers utilize fish wheels to harvest salmon for dog food from summer until fall (Figure 10, Appendix A4).

## **AMOUNTS NECESSARY FOR SUBSISTENCE**

In 2016 the relative success of Kuskokwim River salmon harvests were mixed. Harvest of Chinook salmon was below the ANS range (5 AAC 01.286). Subsistence harvests of chum, sockeye, and coho salmon in the Kuskokwim River were within the ANS ranges but pink salmon harvest exceeded the ANS range defined for the drainage.

The Kuskokwim Bay ANS determination is not broken down by species (5 AAC 01.286). South Kuskokwim Bay harvest was determined to be within the range of ANS for that subarea (Table 8; Appendices A1–A4). ANS in the North Kuskokwim Bay and Bering Sea coastal communities fall under the remainder of the KMA description. In 2016, none of these communities directly participated in the survey and it was impossible to determine the status of ANS for this subarea.

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## **TABLES AND FIGURES**

Table 1.–Kuskokwim Area communities  
by geographic location.

North Kuskokwim Bay	Kipnuk
	Kwigillingok
	Kongiganak
Lower Kuskokwim	Tuntutuliak
	Eek
	Kasigluk
	Nunapitchuk
	Atmautluak
	Napakiak
	Napaskiak
	Oscarville
	Bethel
	Kwethluk
	Akiachak
	Akiak
	Tuluksak
Middle Kuskokwim	Lower Kalskag
	Upper Kalskag
	Aniak
	Chuathbaluk
Upper Kuskokwim	Crooked Creek
	Red Devil
	Sleetmute
	Stony River
	Lime Village
	McGrath
	Takotna
	Nikolai
	Telida
South Kuskokwim Bay	Quinhagak
	Goodnews Bay
	Platinum
Bering Sea Coast	Mekoryuk
	Newtok
	Nightmute
	Toksook Bay
	Tununak
	Chefornak

Table 2.–Households selected and surveyed by user group, 2016.

Community	Unknown					Does not usually fish					Light harvester					Medium harvester					High harvester					Combined use groups							
	N	S	ns	U	PC	N	S	ns	U	PC	N	S	ns	U	PC	N	S	ns	U	PC	N	S	ns	U	PC	N	S	ns	U	PC	R	n	PS
Kongiganak	–	–	–	–	–	14	5	0	0	0.00	62	31	0	0	0.00	12	12	0	0	0.00	2	2	0	0	0.00	90	50	0	0	0.00	0	–	0%
N. Kuskokwim Bay	–	–	–	–	–	14	5	0	0	0.00	62	31	0	0	0.00	12	12	0	0	0.00	2	2	0	0	0.00	90	50	0	0	0.00	0	–	0%
Tuntutuliak	17	1	1	15	16.00	18	6	6	0	1.00	49	24	24	0	1.00	19	19	19	0	1.00	3	3	3	0	1.00	106	53	53	15	1.28	4	64	60%
Eek	9	1	1	8	9.00	25	8	8	0	1.00	56	29	27	0	0.93	5	5	4	0	0.80	1	1	1	0	1.00	96	44	41	8	1.11	6	43	45%
Kasigluk	12	3	3	8	3.67	25	8	8	0	1.00	59	29	26	2	0.97	15	15	14	0	0.93	3	3	3	0	1.00	114	58	54	10	1.10	5	59	52%
Nunapitchuk	7	1	0	6	6.00	23	6	6	0	1.00	66	32	28	2	0.94	15	15	15	0	1.00	10	10	10	0	1.00	121	64	59	8	1.05	0	67	55%
Atmautluak	5	0	0	2	–	20	6	4	4	1.33	29	16	14	4	1.12	9	9	9	0	1.00	4	4	4	0	1.00	67	35	31	10	1.17	2	39	58%
Napakiak	11	3	3	7	3.33	28	10	10	0	1.00	47	22	19	1	0.91	11	11	10	0	0.91	3	3	3	0	1.00	100	49	45	8	1.08	4	49	49%
Napaskiak	12	0	0	9	–	31	10	9	0	0.90	42	20	19	1	1.00	15	15	15	0	1.00	7	7	7	0	1.00	107	52	50	10	1.15	2	58	54%
Oscarville	–	–	–	–	–	2	2	2	0	1.00	8	8	8	0	1.00	5	5	5	0	1.00	–	–	–	–	–	15	15	15	0	1.00	0	15	100%
Bethel	–	–	–	–	–	–	–	–	–	–	1,913	696	696	0	1.00	–	–	–	–	–	–	–	–	–	–	1,913	696	696	0	1.00	108	588	31%
Kwethluk	10	3	2	4	2.00	45	14	10	0	0.71	91	45	34	0	0.76	18	18	13	0	0.72	8	8	8	0	1.00	172	88	67	4	0.81	7	64	37%
Akiachak	16	3	2	13	5.00	45	14	11	1	0.86	80	40	35	3	0.95	17	17	17	0	1.00	7	7	7	0	1.00	165	81	72	17	1.10	0	89	54%
Akiak	9	5	5	4	1.80	21	6	6	0	1.00	39	20	18	1	0.95	10	10	10	0	1.00	9	9	9	0	1.00	88	50	48	5	1.06	13	40	45%
Tuluksak	10	1	1	7	8.00	24	6	6	0	1.00	51	26	25	1	1.00	11	11	10	0	0.91	1	1	0	0	0.00	97	45	42	8	1.11	5	45	46%
Lower Kuskokwim	118	21	18	83	4.81	307	96	86	5	0.95	2,530	1,007	973	15	0.98	150	150	141	0	0.94	56	56	55	0	0.98	3,161	1,330	1,273	103	1.03	156	1,220	39%
Lower Kalskag	12	0	0	10	–	27	8	8	1	1.12	40	20	19	3	1.10	4	4	4	0	1.00	1	1	1	0	1.00	84	33	32	14	1.39	2	44	52%
Upper Kalskag	4	1	0	1	1.00	16	6	6	2	1.33	35	18	17	5	1.22	5	5	4	0	0.80	2	2	2	0	1.00	62	32	29	8	1.16	0	37	60%
Aniak	–	–	–	–	–	–	–	–	–	–	178	150	142	26	1.12	–	–	–	–	–	–	–	–	–	–	178	150	142	26	1.12	9	159	89%
Chuathbaluk	4	0	0	4	–	6	6	6	0	1.00	19	19	18	0	0.95	1	1	1	0	1.00	1	1	1	0	1.00	31	27	26	4	1.11	2	28	90%
Middle Kuskokwim	20	1	0	15	15.00	49	20	20	3	1.15	272	207	196	34	1.11	10	10	9	0	0.90	4	4	4	0	1.00	355	242	229	52	1.16	13	268	75%
Crooked Creek	5	0	0	5	–	14	14	10	0	0.71	13	13	11	0	0.85	4	4	4	0	1.00	–	–	–	–	–	36	31	25	5	0.97	4	26	72%
Red Devil	1	0	0	1	–	1	1	0	0	0.00	3	3	2	0	0.67	2	2	1	0	0.50	1	1	1	0	1.00	8	7	4	1	0.71	0	5	63%
Sleetmute	1	0	0	0	–	7	7	6	0	0.86	23	23	19	0	0.83	2	2	1	0	0.50	1	1	1	0	1.00	34	33	27	0	0.82	2	25	74%
Stony River	1	0	0	1	–	4	4	4	0	1.00	8	8	7	0	0.88	–	–	–	–	–	–	–	–	–	–	13	12	11	1	1.00	1	11	85%
Lime Village	–	–	–	–	–	–	–	–	–	–	6	6	6	0	1.00	1	1	1	0	1.00	2	2	2	0	1.00	9	9	9	0	1.00	0	–	0%
McGrath	26	0	0	26	–	56	17	17	3	1.18	41	21	18	1	0.90	1	1	0	0	0.00	3	3	1	0	0.33	127	42	36	30	1.57	2	64	50%
Takotna	5	1	1	4	5.00	17	17	14	0	0.82	3	3	3	0	1.00	–	–	–	–	–	–	–	–	–	–	25	21	18	4	1.05	3	19	76%
Nikolai	2	0	0	2	–	19	19	19	0	1.00	14	14	14	0	1.00	–	–	–	–	–	1	1	1	0	1.00	36	34	34	2	1.06	0	36	100%
Telida	–	–	–	–	–	–	–	–	–	–	2	1	0	0	0.00	–	–	–	–	–	–	–	–	–	–	2	1	0	0	0.00	–	–	0%
Upper Kuskokwim	41	1	1	39	40.00	118	79	70	3	0.92	113	92	80	1	0.88	10	10	7	0	0.70	8	8	6	0	0.75	290	190	164	43	1.09	12	195	67%
Kuskokwim River total	179	23	23	137	6.78	474	195	176	11	0.96	2,915	1,306	1,249	50	0.99	170	170	157	0	0.92	68	68	65	0	0.96	3,806	1,762	1,666	198	1.06	181	1,683	44%

-continued-

Table 2.–Page 2 of 2.

Community	Unknown					Does not usually fish					Light harvester					Medium harvester					High harvester					Combined use groups							
	N	S	ns	U	PC	N	S	ns	U	PC	N	S	ns	U	PC	N	S	ns	U	PC	N	S	ns	U	PC	N	S	ns	U	PC	R	n	PS
Quinhagak	16	2	1	14	7.50	29	9	9	0	1.00	109	54	51	2	0.98	18	18	18	0	1.00	-	-	-	-	-	172	83	79	16	1.14	3	92	53%
Goodnews Bay	6	1	1	4	5.00	15	5	4	0	0.80	54	27	22	3	0.93	3	3	3	0	1.00	-	-	-	-	-	78	36	30	7	1.03	0	37	47%
Platinum	1	0	0	1	-	5	5	5	0	1.00	11	11	11	0	1.00	-	-	-	-	-	-	-	-	-	-	17	16	16	1	1.06	0	17	100%
S. Kuskokwim Bay	23	3	2	19	7.00	49	19	18	0	0.95	174	92	84	5	0.97	21	21	21	0	1.00	-	-	-	-	-	267	135	125	24	1.10	3	146	55%
Total	202	26	21	156	6.81	537	219	194	11	0.94	3,151	1,429	1,333	55	0.97	203	203	178	0	0.88	70	70	65	0	0.93	4,163	1,947	1,791	222	1.03	184	1,829	44%

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, S = number selected for survey, ns = number selected and surveyed, U = number of unselected houses that were surveyed, PC = the proportion of selected households contacted, R = number of contacted households that refused survey, n = total number of households surveyed (ns + U - R = n); PS = the percentage of households surveyed.

Table 3.–Expanded harvest of Chinook salmon for communities surveyed, Kuskokwim Area, 2016.

Community	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	Total N	Total n	Est. Total	CI (95%)
Kongiganak	–	–	–	–	14	0	–	–	62	0	–	–	12	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	17	16	10	1	18	5	5	4	49	20	14	3	19	18	47	2	3	3	47	0	106	62	1,963	305
Eek	9	9	8	0	25	8	1	1	56	21	20	5	5	3	38	14	1	1	25	–	96	42	1,460	556
Kasigluk	12	11	4	1	25	8	1	0	59	27	8	1	15	11	20	3	3	2	46	20	114	59	951	223
Nunapitchuk	7	6	5	2	23	6	6	5	66	28	11	2	15	14	30	1	10	10	38	0	121	64	1,695	356
Atmautluak	5	2	14	6	20	6	2	1	29	16	11	3	9	9	24	0	4	4	27	0	67	37	763	168
Napakiak	11	9	3	1	28	10	3	2	47	19	15	3	11	8	23	5	3	3	24	0	100	49	1,151	332
Napaskiak	12	8	8	3	31	8	5	3	42	19	17	5	15	15	26	0	7	6	27	6	107	56	1,535	428
Oscarville	–	–	–	–	2	2	6	0	8	8	17	0	5	5	13	0	–	–	–	–	15	15	208	0
Bethel	–	–	–	–	–	–	–	–	1,913	578	5	0	–	–	–	–	–	–	–	–	1,913	578	9,462	1,689
Kwethluk	10	4	0	0	45	9	0	0	91	29	8	2	18	12	37	6	8	8	44	0	172	62	1,731	348
Akiachak	16	14	14	3	45	10	23	17	80	37	18	2	17	16	31	1	7	7	26	0	165	84	3,438	1,592
Akiak	9	7	12	4	21	5	5	3	39	13	15	2	10	9	28	3	9	6	21	4	88	40	1,274	224
Tuluksak	10	7	1	0	24	6	1	1	51	24	11	2	11	8	12	2	1	0	–	–	97	45	709	208
Lower Kalskag	12	10	4	2	27	9	0	0	40	20	9	2	4	4	34	0	1	1	33	–	84	44	578	177
Upper Kalskag	4	1	0	–	16	8	6	4	35	21	15	3	5	4	24	6	2	2	55	0	62	36	838	253
Aniak	–	–	–	–	–	–	–	–	178	158	7	0	–	–	–	–	–	–	–	–	178	158	1,293	134
Chuathbaluk	4	4	0	0	6	5	0	0	19	17	3	0	1	1	30	–	1	1	110	–	31	28	203	12
Crooked Creek	5	4	1	1	14	7	0	0	13	11	9	2	4	3	66	21	–	–	–	–	36	25	384	179
Red Devil	1	1	10	–	1	0	–	–	3	2	0	0	2	1	25	–	1	1	0	–	8	5	69	0
Sleetmute	1	0	–	–	7	6	1	0	23	17	6	1	2	1	1	–	1	1	26	–	34	25	169	57
Stony River	1	1	0	–	4	4	0	0	8	7	4	1	–	–	–	–	–	–	–	–	13	12	33	18
Lime Village	–	–	–	–	–	–	–	–	6	6	2	0	1	1	0	–	2	2	11	0	9	9	35	0
McGrath	26	25	1	0	56	20	5	4	41	18	2	1	1	0	–	–	3	1	0	–	127	64	384	456
Takotna	5	4	0	0	17	12	0	0	3	3	0	0	–	–	–	–	–	–	–	–	25	19	0	0
Nikolai	2	2	10	0	19	19	2	0	14	14	11	0	–	–	–	–	1	1	158	–	36	36	367	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Quinhagak	16	15	34	4	29	9	5	4	109	50	32	3	18	17	37	3	–	–	–	–	172	91	4,822	754
Goodnews Bay	6	5	0	0	15	4	0	0	54	25	11	3	3	3	12	0	–	–	–	–	78	37	654	287
Platinum	1	1	0	–	5	5	0	0	11	11	9	0	–	–	–	–	–	–	–	–	17	17	99	0

Note: This table depicts only the expanded harvest estimates by village. It does not include Bayesian estimates for missed villages. Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed, SE = standard error, CI (95)% = 95% confidence interval.

Table 4.–Expanded harvest of chum salmon for communities surveyed, Kuskokwim Area, 2016.

Community	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	Total N	Total n	Est. Total	CI (95%)
Kongiganak	–	–	–	–	14	0	–	–	62	0	–	–	12	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	17	16	3	0	18	5	0	0	49	20	13	3	19	18	36	1	3	3	93	0	106	62	1,673	314
Eek	9	9	3	0	25	8	1	1	56	22	10	3	5	3	9	3	1	1	15	–	96	43	681	289
Kasigluk	12	11	2	1	25	8	2	1	59	27	10	2	15	11	34	9	3	2	115	20	114	59	1,485	380
Nunapitchuk	7	6	5	1	23	6	1	0	66	28	14	3	15	15	51	0	10	10	70	0	121	65	2,422	358
Atmautluak	5	2	6	5	20	6	3	2	29	15	25	6	9	9	72	0	4	4	37	0	67	36	1,609	385
Napakiak	11	9	8	2	28	10	0	0	47	19	24	5	11	8	63	9	3	3	56	0	100	49	2,091	502
Napaskiak	12	8	2	1	31	8	6	3	42	19	23	5	15	15	33	0	7	6	30	6	107	56	1,901	457
Oscarville	–	–	–	–	2	2	0	0	8	8	17	0	5	5	21	0	–	–	–	–	15	15	240	0
Bethel	–	–	–	–	–	–	–	–	1,913	574	7	1	–	–	–	–	–	–	–	–	1,913	574	13,494	2,587
Kwethluk	10	5	1	1	45	9	1	1	91	28	14	4	18	12	31	5	8	8	51	0	172	62	2,326	669
Akiachak	16	14	17	3	45	10	4	2	80	37	14	1	17	16	25	1	7	7	33	0	165	84	2,176	294
Akiak	9	7	19	6	21	5	9	8	39	13	79	53	10	9	53	7	9	6	202	71	88	40	5,803	4,353
Tuluksak	10	7	29	11	24	6	2	1	51	24	35	7	11	8	49	10	1	0	–	–	97	45	2,698	838
Lower Kalskag	12	10	2	1	27	9	0	0	40	20	10	4	4	4	15	0	1	1	127	–	84	44	624	280
Upper Kalskag	4	1	0	–	16	8	0	0	35	21	11	2	5	4	31	4	2	2	250	0	62	36	1,055	171
Aniak	–	–	–	–	–	–	–	–	178	158	14	2	–	–	–	–	–	–	–	–	178	158	2,422	771
Chuathbaluk	4	4	0	0	6	5	0	0	19	17	5	1	1	1	150	–	1	1	100	–	31	28	347	26
Crooked Creek	5	4	1	0	14	7	1	1	13	11	33	11	4	3	98	20	–	–	–	–	36	25	831	328
Red Devil	1	1	25	–	1	0	–	–	3	2	3	1	2	1	40	–	1	1	0	–	8	5	129	13
Sleetmute	1	0	–	–	7	6	0	0	23	17	9	2	2	1	5	–	1	1	55	–	34	25	268	96
Stony River	1	1	0	–	4	4	0	0	8	7	2	1	–	–	–	–	–	–	–	–	13	12	14	9
Lime Village	–	–	–	–	–	–	–	–	6	6	22	0	1	1	20	–	2	2	41	0	9	9	232	0
McGrath	26	25	0	0	56	20	1	1	41	18	3	1	1	0	–	–	3	1	0	–	127	64	150	102
Takotna	5	4	1	0	17	12	0	0	3	3	0	0	–	–	–	–	–	–	–	–	25	19	5	5
Nikolai	2	2	0	0	19	19	0	0	14	14	0	0	–	–	–	–	1	1	200	–	36	36	205	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Quinhagak	16	15	3	0	29	9	2	2	109	49	5	1	18	17	8	1	–	–	–	–	172	90	848	226
Goodnews Bay	6	5	0	0	15	4	0	0	54	25	4	1	3	3	7	0	–	–	–	–	78	37	219	91
Platinum	1	1	0	–	5	5	0	0	11	11	7	0	–	–	–	–	–	–	–	–	17	17	78	0

Note: This table depicts only the expanded harvest estimates by village. It does not include Bayesian estimates for missed villages. Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed, SE = standard error, CI (95)% = 95% confidence interval.

Table 5.–Expanded harvest of sockeye salmon for communities surveyed, Kuskokwim Area, 2016.

Community	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	Total N	Total n	Est. Total	CI (95%)
Kongiganak	–	–	–	–	14	0	–	–	62	0	–	–	12	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	17	16	6	1	18	5	8	7	49	20	14	3	19	18	31	1	3	3	67	0	106	62	1,707	388
Eek	9	9	8	0	25	8	1	1	56	22	13	3	5	3	6	2	1	1	30	–	96	43	888	291
Kasigluk	12	11	2	0	25	8	9	7	59	27	12	2	15	11	26	5	3	2	66	5	114	59	1,543	466
Nunapitchuk	7	6	6	2	23	6	5	4	66	28	20	5	15	14	35	2	10	10	49	0	121	64	2,508	647
Atmautluak	5	2	12	4	20	6	3	2	29	16	23	6	9	9	65	0	4	4	48	0	67	37	1,562	345
Napakiak	11	9	8	2	28	10	3	2	47	19	24	6	11	8	66	9	3	3	40	0	100	49	2,132	619
Napaskiak	12	8	4	1	31	7	7	3	42	19	25	7	15	15	31	0	7	5	46	12	107	54	2,086	643
Oscarville	–	–	–	–	2	2	2	0	8	8	26	0	5	5	24	0	–	–	–	–	15	15	329	0
Bethel	–	–	–	–	–	–	–	–	1,913	574	9	1	–	–	–	–	–	–	–	–	1,913	574	16,730	2,851
Kwethluk	10	5	1	1	45	9	1	1	91	28	16	3	18	12	28	3	8	8	51	0	172	62	2,464	643
Akiachak	16	14	15	3	45	10	6	2	80	37	17	3	17	16	33	1	7	7	41	0	165	84	2,726	470
Akiak	9	7	12	4	21	5	12	8	39	13	59	26	10	9	44	5	9	6	77	17	88	40	3,772	2,095
Tuluksak	10	7	11	5	24	6	1	0	51	23	12	2	11	8	47	10	1	0	–	–	97	44	1,249	353
Lower Kalskag	12	10	3	1	27	9	0	0	40	20	3	2	4	4	22	0	1	1	29	–	84	44	284	120
Upper Kalskag	4	1	0	–	16	8	9	6	35	21	14	3	5	4	63	24	2	2	110	0	62	36	1,176	394
Aniak	–	–	–	–	–	–	–	–	178	158	47	11	–	–	–	–	–	–	–	–	178	158	8,380	3,852
Chuathbaluk	4	4	3	0	6	5	0	0	19	17	4	1	1	1	100	–	1	1	25	–	31	28	210	20
Crooked Creek	5	4	3	1	14	7	0	0	13	11	10	2	4	3	31	6	–	–	–	–	36	25	264	77
Red Devil	1	1	18	–	1	0	–	–	3	2	30	17	2	1	50	–	1	1	0	–	8	5	238	153
Sleetmute	1	0	–	–	7	6	1	0	23	17	13	2	2	1	50	–	1	1	44	–	34	25	458	101
Stony River	1	1	0	–	4	4	0	0	8	7	12	2	–	–	–	–	–	–	–	–	13	12	95	42
Lime Village	–	–	–	–	–	–	–	–	6	6	25	0	1	1	20	–	2	2	186	0	9	9	541	0
McGrath	26	25	0	0	56	20	1	1	41	18	3	1	1	0	–	–	3	1	0	–	127	64	199	151
Takotna	5	4	1	0	17	12	0	0	3	3	0	0	–	–	–	–	–	–	–	–	25	19	5	4
Nikolai	2	2	0	0	19	19	0	0	14	14	0	0	–	–	–	–	1	1	30	–	36	36	34	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Quinhagak	16	15	9	1	29	9	3	2	109	50	11	3	18	17	12	1	–	–	–	–	172	91	1,691	722
Goodnews Bay	6	5	0	0	15	4	0	0	54	25	15	3	3	3	57	0	–	–	–	–	78	37	975	357
Platinum	1	1	0	–	5	5	0	0	11	11	35	0	–	–	–	–	–	–	–	–	17	17	381	0

Note: This table depicts only the expanded harvest estimates by village. It does not include Bayesian estimates for missed villages. Headings defined as: N = the total number of households, n = the number of households surveyed, SE = standard error, CI (95)% = 95% confidence interval.

Table 6.–Expanded harvest of coho salmon for surveyed communities, Kuskokwim Area, 2016.

Community	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	Total N	Total n	Est. Total	CI (95%)
Kongiganak	–	–	–	–	14	0	–	–	62	0	–	–	12	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	17	16	0	0	18	5	7	6	49	20	1	1	19	17	10	1	3	3	26	0	106	61	456	222
Eek	9	9	3	0	25	8	2	2	56	22	3	1	5	3	28	14	1	1	10	–	96	43	410	215
Kasigluk	12	11	0	0	25	8	2	2	59	27	4	3	15	11	6	2	3	2	0	0	114	59	394	367
Nunapitchuk	7	6	1	0	23	6	0	0	66	28	3	2	15	15	6	0	10	10	19	0	121	65	492	258
Atmautluak	5	2	4	3	20	7	1	1	29	16	0	0	9	9	2	0	4	4	5	0	67	38	81	54
Napakiak	11	9	2	1	28	10	5	3	47	19	5	2	11	8	10	2	3	3	0	0	100	49	506	210
Napaskiak	12	8	0	0	31	7	3	3	42	19	7	2	15	15	19	0	7	6	6	2	107	55	726	239
Oscarville	–	–	–	–	2	2	8	0	8	8	7	0	5	5	12	0	–	–	–	–	15	15	134	0
Bethel	–	–	–	–	–	–	–	–	1,913	575	9	1	–	–	–	–	–	–	–	–	1,913	575	16,801	3,152
Kwethluk	10	5	0	0	45	9	0	0	91	29	4	1	18	12	9	1	8	8	22	0	172	63	682	171
Akiachak	16	14	6	1	45	11	10	5	80	37	8	2	17	16	15	1	7	7	76	0	165	85	2,007	507
Akiak	9	7	7	3	21	5	10	6	39	13	44	28	10	9	17	2	9	6	27	14	88	40	2,403	2,248
Tuluksak	10	7	2	1	24	6	1	1	51	24	8	3	11	8	1	0	1	0	–	–	97	45	482	338
Lower Kalskag	12	10	4	1	27	9	0	0	40	20	4	2	4	4	10	0	1	1	0	–	84	44	228	124
Upper Kalskag	4	1	0	–	16	8	1	1	35	21	6	2	5	4	38	17	2	2	160	0	62	36	722	219
Aniak	–	–	–	–	–	–	–	–	178	159	42	10	–	–	–	–	–	–	–	–	178	159	7,530	3,530
Chuathbaluk	4	4	3	0	6	5	1	0	19	17	5	1	1	1	20	–	1	1	10	–	31	28	149	26
Crooked Creek	5	4	5	2	14	7	5	3	13	11	8	2	4	3	25	9	–	–	–	–	36	25	298	122
Red Devil	1	1	25	–	1	0	–	–	3	2	0	0	2	1	60	–	1	1	0	–	8	5	166	0
Sleetmute	1	0	–	–	7	6	0	0	23	16	3	1	2	1	0	–	1	1	437	–	34	24	524	47
Stony River	1	1	0	–	4	4	0	0	8	7	4	1	–	–	–	–	–	–	–	–	13	12	29	10
Lime Village	–	–	–	–	–	–	–	–	6	6	15	0	1	1	0	–	2	2	18	0	9	9	123	0
McGrath	26	25	5	1	56	20	1	0	41	18	15	5	1	0	–	–	3	1	0	–	127	64	769	374
Takotna	5	4	15	7	17	12	1	0	3	3	2	0	–	–	–	–	–	–	–	–	25	19	90	71
Nikolai	2	2	0	0	19	19	0	0	14	14	1	0	–	–	–	–	1	1	600	–	36	36	614	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Quinhagak	16	15	8	1	29	9	5	4	109	50	13	3	18	17	16	2	–	–	–	–	172	91	2,014	640
Goodnews Bay	6	5	5	1	15	4	0	0	54	25	6	1	3	3	9	0	–	–	–	–	78	37	378	143
Platinum	1	1	0	–	5	5	0	0	11	11	16	0	–	–	–	–	–	–	–	–	17	17	180	0

Note: This table depicts only the expanded harvest estimates by village. It does not include Bayesian estimates for missed villages. Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed, SE = standard error, CI (95)% = 95% confidence interval.



Table 7.–Expanded harvest of pink salmon for communities surveyed, Kuskokwim Area, 2016.

Community	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	Total N	Total n	Est. Total	CI (95%)
Kongiganak	–	–	–	–	14	0	–	–	62	0	–	–	12	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	17	16	0	0	18	5	1	1	49	19	0	0	19	18	3	0	3	3	10	0	106	61	130	51
Eek	9	9	0	0	25	8	0	0	56	22	0	0	5	3	8	4	1	1	0	–	96	43	58	43
Kasigluk	12	11	0	0	25	8	0	0	59	27	0	0	15	11	0	0	3	2	1	0	114	59	24	21
Nunapitchuk	7	6	1	0	23	6	0	0	66	28	0	0	15	15	1	0	10	10	0	0	121	65	26	5
Atmautluak	5	2	0	0	20	6	2	1	29	16	1	1	9	9	1	0	4	4	1	0	67	37	83	66
Napakiak	11	9	0	0	28	10	0	0	47	19	5	3	11	8	0	0	3	3	0	0	100	49	220	234
Napaskiak	12	8	0	0	31	8	0	0	42	19	1	1	15	15	1	0	7	6	5	1	107	56	95	68
Oscarville	–	–	–	–	2	2	0	0	8	8	0	0	5	5	1	0	–	–	–	–	15	15	8	0
Bethel	–	–	–	–	–	–	–	–	1,913	576	1	0	–	–	–	–	–	–	–	–	1,913	576	1,564	479
Kwethluk	10	5	0	0	45	9	1	1	91	30	1	0	18	12	4	1	8	7	1	0	172	63	209	96
Akiachak	16	15	0	0	45	11	0	0	80	37	2	1	17	16	2	0	7	7	4	0	165	86	199	84
Akiak	9	7	0	0	21	5	0	0	39	13	16	13	10	9	2	0	9	6	2	1	88	40	649	989
Tuluksak	10	7	1	0	24	6	0	0	51	24	3	2	11	8	0	0	1	0	–	–	97	45	158	162
Lower Kalskag	12	10	0	0	27	9	0	0	40	20	0	0	4	4	0	0	1	1	0	–	84	44	0	0
Upper Kalskag	4	1	0	–	16	8	0	0	35	21	1	1	5	4	0	0	2	2	25	0	62	36	87	39
Aniak	–	–	–	–	–	–	–	–	178	158	3	1	–	–	–	–	–	–	–	–	178	158	478	298
Chuathbaluk	4	4	0	0	6	5	0	0	19	17	5	1	1	1	0	–	1	1	0	–	31	28	92	55
Crooked Creek	5	4	0	0	14	7	0	0	13	11	0	0	4	4	0	0	–	–	–	–	36	26	2	2
Red Devil	1	1	0	–	1	0	–	–	3	2	0	0	2	1	0	–	1	1	0	–	8	5	0	0
Sleetmute	1	0	–	–	7	6	0	0	23	17	1	0	2	1	0	–	1	1	12	–	34	25	24	9
Stony River	1	1	0	–	4	4	0	0	8	7	1	1	–	–	–	–	–	–	–	–	13	12	11	9
Lime Village	–	–	–	–	–	–	–	–	6	6	4	0	1	1	0	–	2	2	100	0	9	9	225	0
McGrath	26	25	0	0	56	20	0	0	41	18	0	0	1	0	–	–	3	1	0	–	127	64	0	0
Takotna	5	4	1	0	17	12	0	0	3	3	0	0	–	–	–	–	–	–	–	–	25	19	2	2
Nikolai	2	2	0	0	19	19	0	0	14	14	0	0	–	–	–	–	1	1	7	–	36	36	7	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Quinhagak	16	15	2	0	29	9	0	0	109	50	1	0	18	17	1	0	–	–	–	–	172	91	115	48
Goodnews Bay	6	5	0	0	15	4	0	0	54	25	1	0	3	3	2	0	–	–	–	–	78	37	41	22
Platinum	1	1	0	–	5	5	0	0	11	11	2	0	–	–	–	–	–	–	–	–	17	17	20	0

Note: This table depicts only the expanded harvest estimates by village. Bayesian estimates are not performed for pink salmon for missed villages. Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed, SE = standard error, CI (95)% = 95% confidence interval.

Table 8.—Total estimated subsistence salmon harvest by species and community for the Kuskokwim Area, 2016.

Community	Households (HH)			Chinook			Chum			Sockeye			Coho			Pink		
	Total N	Total n survey	%	Avg HH	Est. total harvest	CI (95%)	Avg HH	Est. total harvest	CI (95%)	Avg HH	Est. total harvest	CI (95%)	Avg HH	Est. total harvest	CI (95%)	Avg HH	Est. total harvest	CI (95%)
Kongiganak <sup>a</sup>	90	0	0%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
N. Kuskokwim Bay	90	0	0%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tuntutuliak	106	64	60%	19	1,963	305	16	1,673	314	16	1,707	388	4	456	222	1	130	51
Eek	96	43	45%	15	1,460	556	7	681	289	9	888	291	4	410	215	1	58	43
Kasigluk <sup>b</sup>	114	59	52%	8	951	223	13	1,485	380	14	1,543	466	3	394	367	0	24	21
Nunapitchuk <sup>b</sup>	121	67	55%	14	1,695	356	20	2,422	358	21	2,508	647	4	492	258	0	26	5
Atmautluak <sup>b</sup>	67	39	58%	11	763	168	24	1,609	385	23	1,562	345	1	81	54	1	83	66
Napakiak <sup>b</sup>	100	49	49%	12	1,151	332	21	2,091	502	21	2,132	619	5	506	210	2	220	234
Napaskiak <sup>b</sup>	107	58	54%	14	1,535	428	18	1,901	457	19	2,086	643	7	726	239	1	95	68
Oscarville <sup>b</sup>	15	15	100%	14	208	0	16	240	0	22	329	0	9	134	0	1	8	0
Bethel <sup>c</sup>	1,913	588	31%	5	9,462	1,689	7	13,494	2,587	9	16,730	2,851	9	16,801	3,152	1	1,564	479
Kwethluk <sup>b</sup>	172	64	37%	10	1,731	348	14	2,326	669	14	2,464	643	4	682	171	1	209	96
Akiachak <sup>b</sup>	165	89	54%	21	3,438	1,592	13	2,176	294	17	2,726	470	12	2,007	507	1	199	84
Akiak <sup>b</sup>	88	40	45%	14	1,274	224	66	5,803	4,353	43	3,772	2,095	27	2,403	2,248	7	649	989
Tuluksak	97	45	46%	7	709	208	28	2,698	838	13	1,249	353	5	482	338	2	158	162
Lower Kuskokwim	3,161	1,220	39%	8	26,340	2,525	12	38,599	5,171	13	39,696	3,832	8	25,574	3,930	1	3,423	1,121
Lower Kalskag <sup>b</sup>	84	44	52%	7	578	177	7	624	280	3	284	120	3	228	124	0	0	0
Upper Kalskag <sup>b</sup>	62	37	60%	14	838	253	17	1,055	171	19	1,176	394	12	722	219	1	87	39
Aniak <sup>b</sup>	178	159	89%	7	1,293	134	14	2,422	771	47	8,380	3,852	42	7,530	3,530	3	478	298
Chuathbaluk	31	28	90%	7	203	12	11	347	26	7	210	20	5	149	26	3	92	55
Middle Kuskokwim	355	268	75%	8	2,912	329	13	4,448	833	28	10,050	3,860	24	8,629	3,528	2	656	305
Crooked Creek	36	26	72%	11	384	179	23	831	328	7	264	77	8	298	122	0	2	2
Red Devil	8	5	63%	9	69	0	16	129	13	30	238	153	21	166	0	0	0	0
Sleetmute	34	25	74%	5	169	57	8	268	96	13	458	101	15	524	47	1	24	9
Stony River	13	11	85%	3	33	18	1	14	9	7	95	42	2	29	10	1	11	9
Lime Village <sup>a</sup>	9	—	0%	—	35	0	—	232	0	—	541	0	—	123	0	—	225	0
McGrath <sup>b</sup>	127	64	50%	3	384	456	1	150	102	2	199	151	6	769	374	0	0	0
Takotna	25	19	76%	0	0	0	0	5	5	0	5	4	0	90	71	—	2	2
Nikolai	36	36	100%	10	367	0	6	205	0	1	34	0	17	614	0	0	7	0
Telida <sup>a</sup>	2	—	0%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Upper Kuskokwim	290	186	64%	5	1,441	485	6	1,834	343	6	1,834	228	9	2,613	396	1	272	12

-continued-

Table 8.–Page 2 of 2.

Community	Households (HH)			Chinook			Chum			Sockeye			Coho			Pink		
	Total N	Total n	% survey	Avg HH	Est. total harvest	CI (95%)	Avg HH	Est. total harvest	CI (95%)	Avg HH	Est. total harvest	CI (95%)	Avg HH	Est. total harvest	CI (95%)	Avg HH	Est. total harvest	CI (95%)
Kuskokwim River <sup>d</sup>	3,896	1,674	43%	8	30,693	2,591	12	44,881	5,247	13	51,580	5,433	9	36,816	5,286	1	4,351	1,161
Quinhagak	78	92	118%	62	4,822	754	11	848	226	22	1,691	722	26	2,014	640	1	115	48
Goodnews Bay	17	37	218%	38	654	287	13	219	91	57	975	357	22	378	143	0	41	22
Platinum	267	17	6%	0	99	0	0	78	0	1	381	0	1	180	0	0	20	0
S. Kuskokwim Bay	362	146	40%	15	5,575	801	3	1,145	242	8	3,047	798	7	2,572	652	0	176	52
Total	4,258	1,820	43%	9	36,268	2,710	11	46,026	5,252	13	54,627	5,490	9	39,388	5,325	1	4,527	1,163

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed, HH = household harvest, CI (95)% = 95% confidence interval.

<sup>a</sup> Villages not surveyed. Harvest was not estimated due to lack of recent data.

<sup>b</sup> Estimate includes a tally of Chinook salmon harvested under the USFWS issued permits.

<sup>c</sup> The Bethel estimate contains both the permit numbers from Bethel and the seasonal village of Napaimute.

<sup>d</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 9.—Estimated number of salmon retained from commercial fishing for subsistence use, Kuskokwim Area, 2016.

Community	N	n	Chinook		Chum		Sockeye		Coho		Pink	
			Estimated retained	95% CI	Estimated retained	95% CI	Estimated retained	95% CI	Estimated retained	95% CI	Estimated retained	95% CI
Kongiganak	90	0	–	–	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	90	0	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	106	64	0	0	0	0	0	0	0	0	0	0
Eek	96	42	0	0	0	0	0	0	0	0	0	0
Kasigluk	114	59	0	0	0	0	0	0	0	0	0	0
Nunapitchuk	121	67	0	0	0	0	0	0	0	0	0	0
Atmautluak	67	37	0	0	0	0	0	0	0	0	0	0
Napakiak	100	49	0	0	0	0	0	0	0	0	0	0
Napaskiak	107	58	0	0	0	0	0	0	0	0	0	0
Oscarville	15	15	0	0	0	0	0	0	0	0	0	0
Bethel	1,913	594	0	0	0	0	0	0	0	0	0	0
Kwethluk	172	64	0	0	0	0	0	0	0	0	0	0
Akiachak	165	89	0	0	0	0	0	0	0	0	0	0
Akiak	88	40	0	0	0	0	0	0	0	0	0	0
Tuluksak	97	42	0	0	0	0	0	0	0	0	0	0
Lower Kuskokwim	3,161	1,220	0	0	0	0	0	0	0	0	0	0
Lower Kalskag	84	44	0	0	0	0	0	0	0	0	0	0
Upper Kalskag	62	37	0	0	0	0	0	0	0	0	0	0
Aniak	178	159	0	0	0	0	0	0	0	0	0	0
Chuathbaluk	31	28	0	0	0	0	0	0	0	0	0	0
Middle Kuskokwim	355	268	0	0	0	0	0	0	0	0	0	0
Crooked Creek	36	25	0	0	0	0	0	0	0	0	0	0
Red Devil	8	5	0	0	0	0	0	0	0	0	0	0
Sleetmute	34	25	0	0	0	0	0	0	0	0	0	0
Stony River	13	12	0	0	0	0	0	0	0	0	0	0
Lime Village	9	9	0	0	0	0	0	0	0	0	0	0
McGrath	127	64	0	0	0	0	0	0	0	0	0	0
Takotna	25	19	0	0	0	0	0	0	0	0	0	0
Nikolai	36	36	0	0	0	0	0	0	0	0	0	0
Telida	2	0	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	290	195	0	0	0	0	0	0	0	0	0	0
Kuskokwim River <sup>a</sup>	3,896	1,683	0	0	0	0	0	0	0	0	0	0
Quinhagak	172	92	0	0	0	0	0	0	0	0	0	0
Goodnews	78	37	0	0	0	0	0	0	0	0	0	0
Platinum	17	17	0	0	0	0	0	0	0	0	0	0
S. Kuskokwim Bay	267	146	0	0	0	0	0	0	0	0	0	0
Survey Total	4,163	1,829	0	0	0	0	0	0	0	0	0	0

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 10.–Fishing gear reported as the primary type used by subsistence fishermen, Kuskokwim Area, 2016.

Community	N	n	Setnet	Driftnet	Fish wheel	Hook & Line	Dip Net	Other
Kongiganak	90	0	–	–	–	–	–	–
N. Kuskokwim Bay	90	0	–	–	–	–	–	–
Tuntutuliak	106	64	29	41	0	0	0	0
Eek	96	43	5	54	0	0	0	3
Kasigluk	114	59	0	62	0	0	0	0
Nunapitchuk	121	67	2	80	0	0	0	0
Atmautluak	67	38	0	43	0	0	0	0
Napakiak	100	49	2	60	0	0	0	0
Napaskiak	107	58	3	69	0	0	0	0
Oscarville	15	15	0	11	0	1	0	0
Bethel	1,913	595	29	762	0	42	0	0
Kwethluk	172	64	9	90	0	3	0	0
Akiachak	165	89	10	128	0	0	0	0
Akiak	88	40	10	57	0	0	0	0
Tuluksak	97	45	2	53	0	4	0	0
Lower Kuskokwim	3,161	1,226	101	1,510	0	50	0	3
Lower Kalskag	84	44	6	28	10	0	0	0
Upper Kalskag	62	37	1	37	0	0	0	0
Aniak	178	159	6	61	7	18	1	0
Chuathbaluk	31	28	1	19	0	2	0	0
Middle Kuskokwim	355	268	14	145	17	20	1	0
Crooked Creek	36	26	1	17	0	1	0	0
Red Devil	8	5	0	6	0	2	0	0
Sleetmute	34	25	6	11	1	1	0	0
Stony River	13	12	2	0	0	4	0	0
Lime Village	9	9	4	0	0	1	1	0
McGrath	127	64	21	0	6	8	0	0
Takotna	25	19	3	0	0	1	0	0
Nikolai	36	36	4	0	0	10	0	0
Telida	2	0	–	–	–	–	–	–
Upper Kuskokwim	288	196	41	34	7	28	1	0
Kuskokwim River <sup>a</sup>	3,894	1,690	156	1,689	24	98	2	3
Quinhagak	172	92	9	87	0	33	0	0
Goodnews	78	37	17	17	0	17	1	0
Platinum	17	17	6	3	0	1	0	0
S. Kuskokwim Bay	267	146	32	107	0	51	1	0
Total	4,071	1,836	188	1,796	24	149	3	3

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 11.—Estimated number of households that subsistence fished in communities surveyed, Kuskokwim Area, 2016.

Community	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	Total N	Total n	Est. Total	CI (95%)
Kongiganak	–	–	–	–	14	0	–	–	62	0	–	–	12	0	–	–	2	0	–	–	90	0	–	–
N. Kuskokwim Bay	–	–	–	–	14	0	–	–	62	0	–	–	12	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	17	16	0	0	18	5	0	0	49	22	1	0	19	18	1	0	3	3	1	0	106	64	70	9
Eek	9	9	0	0	25	8	0	0	56	22	1	0	5	3	1	0	1	1	1	0	96	43	62	10
Kasigluk	12	11	0	0	25	8	0	0	59	27	1	0	15	11	1	0	3	2	1	–	114	59	62	11
Nunapitchuk	7	6	1	0	23	6	0	0	66	30	1	0	15	15	1	0	10	10	1	0	121	67	82	10
Atmautluak	5	2	1	–	20	7	0	0	29	16	1	0	9	9	1	0	4	4	1	0	67	38	43	8
Napakiak	11	9	0	0	28	10	0	0	47	19	1	0	11	8	1	0	3	3	1	0	100	49	62	10
Napaskiak	12	8	1	0	31	9	1	0	42	20	1	0	15	15	1	0	7	6	1	0	107	58	72	12
Oscarville	–	–	–	–	2	2	1	–	8	8	1	0	5	5	1	0	–	–	–	–	15	15	12	0
Bethel	–	–	–	–	–	–	–	–	1913	595	0	0	–	–	–	–	–	–	–	–	1,913	595	833	63
Kwethluk	10	5	0	0	45	9	0	0	91	30	1	0	18	12	1	0	8	8	1	0	172	64	102	11
Akiachak	16	15	1	0	45	12	1	0	80	38	1	0	17	17	1	0	7	7	1	0	165	89	138	12
Akiak	9	7	1	0	21	5	0	0	39	13	1	0	10	9	1	0	9	6	1	0	88	40	67	11
Tuluksak	10	7	0	0	24	6	0	0	51	24	1	0	11	8	1	0	1	0	–	–	97	45	59	12
Lower Kuskokwim	118	95	1	0	307	87	0	0	2,530	864	1	0	150	130	1	0	56	50	1	0	3,161	1,226	1,663	72
Lower Kalskag	12	10	0	0	27	9	0	0	40	20	1	0	4	4	1	0	1	1	1	0	84	44	43	10
Upper Kalskag	4	1	0	0	16	8	0	0	35	22	1	0	5	4	1	0	2	2	1	–	62	37	38	5
Aniak	–	–	–	–	–	–	–	–	178	159	1	0	–	–	–	–	–	–	–	–	178	159	93	5
Chuathbaluk	4	4	0	0	6	5	1	0	19	17	1	0	1	1	1	0	1	1	1	0	31	28	22	2
Middle Kuskokwim	20	15	0	0	49	22	0	0	272	218	1	0	10	9	1	0	4	4	1	0	355	268	196	12
Crooked Creek	5	4	0	0	14	7	0	0	13	11	1	0	4	4	1	0	–	–	–	–	36	26	19	4
Red Devil	1	1	1	0	1	0	–	–	3	2	1	–	2	1	1	0	1	1	0	0	8	5	7	0
Sleetmute	1	0	–	–	7	6	0	0	23	17	1	0	2	1	1	0	1	1	1	0	34	25	19	3
Stony River	1	1	0	0	4	4	0	0	8	7	1	0	–	–	–	–	–	–	–	–	13	12	6	1
Lime Village	–	–	–	–	–	–	–	–	6	6	1	0	1	1	1	0	2	2	1	–	9	9	6	0
McGrath	26	25	0	0	56	20	0	0	41	18	1	0	1	0	–	–	3	1	0	0	127	64	35	10
Takotna	5	4	0	0	17	12	0	0	3	3	0	0	–	–	–	–	–	–	–	–	25	19	4	2
Nikolai	2	2	1	–	19	19	0	0	14	14	1	0	–	–	–	–	1	1	1	0	36	36	14	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Upper Kuskokwim	41	37	0	0	118	68	0	0	113	78	1	0	10	7	1	0	8	6	1	0	290	196	109	11
Kuskokwim River <sup>a</sup>	179	147	0	0	474	177	0	0	2,915	1,160	1	0	170	146	1	0	68	60	1	0	3,806	1,690	1,969	74

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Table 11.–Page 2 of 2.

Community	Unknown				Does not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	Total N	Total n	Est. Total	CI (95%)
Quinhagak	16	15	1	0	29	9	0	0	109	51	1	0	18	17	1	0	-	-	-	-	172	92	129	10
Goodnews Bay	6	5	1	0	15	4	0	0	54	25	1	0	3	3	1	0	-	-	-	-	78	37	53	9
Platinum	1	1	0	0	5	5	0	0	11	11	1	0	-	-	-	-	-	-	-	-	17	17	10	0
S. Kuskokwim Bay	23	21	1	0	49	18	0	0	174	87	1	0	21	20	1	0	-	-	-	-	267	146	192	14
Total	202	168	0	0	537	195	0	0	3,151	1,247	1	0	203	166	1	0	70	60	1	0	4,163	1,836	2,160	75

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed, SE = standard error, Est. Total = estimated total number of households from all use groups that subsistence fished, expressed as a proportion of households from each group that fished, based on the number of households surveyed, and their responses to the question: “Did you subsistence fish?”, CI (95)% = 95% confidence interval.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 12.–Estimated number of people living in communities surveyed, Kuskokwim Area, 2016.

Community	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	Total N	Total n	Est. Total	CI (95%)
Kongiganak	–	–	–	–	14	0	–	–	62	0	–	–	12	0	–	–	2	0	–	–	90	0	–	–
N. Kuskokwim Bay	–	–	–	–	14	0	–	–	62	0	–	–	12	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	17	16	3	0	18	5	3	1	49	22	5	0	19	18	4	0	3	3	6	0	106	64	418	54
Eek	9	9	3	0	25	8	2	0	56	22	3	0	5	3	3	1	1	1	11	–	96	43	295	41
Kasigluk	12	11	4	0	25	8	5	1	59	27	6	0	15	11	6	1	3	2	8	1	114	59	613	62
Nunapitchuk	7	6	5	0	23	6	3	0	66	30	5	0	15	15	6	0	10	10	8	0	121	67	607	54
Atmautluak	5	2	7	3	20	6	5	1	29	15	7	1	9	8	5	0	4	4	7	0	67	35	394	61
Napakiak	11	9	3	0	28	10	3	1	47	19	4	1	11	8	4	0	3	3	7	0	100	49	368	56
Napaskiak	12	8	4	0	31	8	5	1	42	20	5	0	15	15	5	0	7	6	5	0	107	57	528	68
Oscarville	–	–	–	–	2	2	3	0	8	8	4	0	5	5	5	0	–	–	–	–	15	15	63	0
Bethel	–	–	–	–	–	–	–	–	1,913	580	3	0	–	–	–	–	–	–	–	–	1,913	580	6,108	239
Kwethluk	10	5	4	1	45	9	5	1	91	30	6	0	18	12	7	1	8	8	4	0	172	64	926	94
Akiachak	16	15	3	0	45	12	4	1	80	37	5	0	17	17	5	0	7	7	6	0	165	88	750	69
Akiak	9	7	4	0	21	4	4	1	39	13	5	1	10	9	6	0	9	6	6	1	88	39	432	69
Tuluksak	10	7	2	0	24	6	5	1	51	24	4	0	11	8	7	0	1	0	–	–	97	45	416	61
Lower Kuskokwim	118	95	4	0	307	84	4	0	2,530	847	4	0	150	129	5	0	56	50	6	0	3,161	1,205	11,919	316
Lower Kalskag	12	10	2	0	27	9	2	1	40	19	4	0	4	4	5	0	1	1	2	–	84	43	271	40
Upper Kalskag	4	1	1	–	16	8	4	0	35	22	4	0	5	4	5	1	2	2	7	0	62	37	249	28
Aniak	–	–	–	–	–	–	–	–	178	158	3	0	–	–	–	–	–	–	–	–	178	158	569	16
Chuathbaluk	4	4	2	0	6	5	5	1	19	17	3	0	1	1	3	–	1	1	5	–	31	28	98	8
Middle Kuskokwim	20	15	2	0	49	22	3	0	272	216	3	0	10	9	5	0	4	4	5	0	355	266	1,187	51
Crooked Creek	5	4	3	0	14	7	3	1	13	11	3	0	4	4	4	0	–	–	–	–	36	26	108	18
Red Devil	1	1	4	–	1	0	–	–	3	2	2	0	2	1	2	–	1	1	1	–	8	5	15	3
Sleetmute	1	0	–	–	7	5	2	0	23	17	3	0	2	1	2	–	1	1	2	–	34	24	83	8
Stony River	1	1	4	–	4	4	3	0	8	7	4	0	–	–	–	–	–	–	–	–	13	12	48	6
Lime Village	–	–	–	–	–	–	–	–	6	6	2	0	1	1	2	–	2	2	3	0	9	9	20	0
McGrath	26	24	2	0	56	20	2	0	41	18	3	0	1	0	–	–	3	1	2	–	127	63	326	33
Takotna	5	4	2	0	17	12	3	0	3	3	3	0	–	–	–	–	–	–	–	–	25	19	63	11
Nikolai	2	2	2	0	19	19	2	0	14	14	3	0	–	–	–	–	1	1	3	–	36	36	89	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Upper Kuskokwim	41	36	2	0	118	67	2	0	113	78	3	0	10	7	3	0	8	6	2	0	290	194	753	40
Kuskokwim River <sup>a</sup>	179	146	3	0	474	173	4	0	2,915	1,141	4	0	170	145	5	0	68	60	6	0	3,806	1,665	13,859	323

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Table 12.–Page 2 of 2.

Community	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	N	n	Mean	SE	Total N	Total n	Est. Total	CI (95%)
Quinhagak	16	15	3	0	29	9	2	0	109	50	5	0	18	17	5	0	-	-	-	-	172	91	716	63
Goodnews Bay	6	5	3	0	15	4	2	0	54	25	4	0	3	3	4	0	-	-	-	-	78	37	288	37
Platinum	1	1	5	-	5	5	2	0	11	11	3	0	-	-	-	-	-	-	-	-	17	17	51	0
S. Kuskokwim Bay	23	21	3	0	49	18	2	0	174	86	5	0	21	20	5	0	-	-	-	-	267	145	1055	73
Survey Total	202	167	3	0	537	191	3	0	3151	1227	4	0	203	165	5	0	70	60	6	0	4163	1810	14914	330

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed, SE = standard error, Est. Total = estimated total number of households from all use groups that subsistence fished, expressed as a proportion of households from each group that fished, based on the number of households surveyed, and their responses to the question: "Did you subsistence fish?", CI (95)% = 95% confidence interval.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 13.—Number of fish reported as received from subsistence fisheries, Kuskokwim Area, 2016.

Community	N	Chinook			Chum			Sockeye			Coho			Pink		
		n	Estimate	CI(95%)	n	Estimate	CI(95%)	n	Estimate	CI(95%)	n	Estimate	CI(95%)	n	Estimate	CI(95%)
Kongiganak	90	0	—	—	0	—	—	0	—	—	0	—	—	0	—	—
N. Kuskokwim Bay	90	0	—	—	0	—	—	0	—	—	0	—	—	0	—	—
Tuntutuliak	106	62	201	126	61	157	123	62	191	120	63	132	116	63	1	1
Eek	96	43	112	112	43	16	17	43	41	27	43	28	16	43	7	10
Kasigluk	114	58	119	57	57	232	156	57	115	51	57	158	139	58	5	2
Nunapitchuk	121	66	75	20	64	132	110	64	142	111	67	69	47	67	7	7
Atmautluak	67	35	57	40	34	359	337	34	210	106	35	82	101	35	10	14
Napakiak	100	48	109	63	48	82	48	48	158	91	48	109	89	48	1	1
Napaskiak	107	58	227	175	57	187	184	58	271	159	57	223	189	57	0	0
Oscarville	15	14	1	0	15	0	0	15	22	0	14	8	0	15	0	0
Bethel	1,913	567	1,225	255	562	1,886	1,043	564	1,696	325	561	2,319	478	563	173	128
Kwethluk	172	60	246	149	59	130	75	59	189	117	61	238	101	63	5	9
Akiachak	165	86	71	42	86	63	46	86	63	39	86	84	11	86	2	2
Akiak	88	40	50	54	40	127	130	40	69	58	40	46	54	40	6	10
Tuluksak	97	45	45	43	44	18	14	45	39	31	45	34	22	45	0	0
Lower Kuskokwim	3,161	1,182	2,538	397	1,170	3,389	1,140	1,175	3,205	442	1,177	3,528	571	1,183	218	130
Lower Kalskag	84	43	109	44	43	181	74	43	202	144	43	79	31	43	4	3
Upper Kalskag	62	36	38	22	36	64	47	36	34	26	36	58	33	36	0	0
Aniak	178	156	128	24	157	74	18	157	170	41	157	289	53	158	0	0
Chuathbaluk	31	28	3	2	28	3	2	28	36	11	28	46	33	28	1	1
Middle Kuskokwim	355	263	278	54	264	322	88	264	442	149	264	472	76	265	5	3
Crooked Creek	36	25	8	4	24	0	0	25	13	9	24	5	7	24	0	0
Red Devil	8	5	14	0	5	7	0	5	16	0	5	46	0	5	0	0
Sleetmute	34	25	79	27	25	25	3	25	167	56	25	108	49	24	0	0
Stony River	13	12	16	10	12	0	0	12	1	0	12	0	0	12	0	0
Lime Village	9	9	0	0	9	10	0	7	88	79	9	0	0	9	0	0
McGrath	127	61	200	278	61	1	0	62	38	30	61	102	39	62	0	0
Takotna	25	19	13	13	19	0	0	19	7	0	19	38	12	19	0	0
Nikolai	36	35	105	22	34	4	2	34	0	0	34	6	2	34	0	0
Telida	2	0	—	—	0	—	—	0	—	—	0	—	—	0	—	—
Upper Kuskokwim	290	191	434	276	189	47	4	189	330	90	189	305	62	189	0	0
Kuskokwim River <sup>a</sup>	3,896	1,636	3,250	727	1,623	3,758	1,232	1,628	3,977	681	1,630	4,305	709	1,637	223	133
Quinhagak	172	90	453	162	90	86	80	90	239	126	90	249	111	89	2	3
Goodnews Bay	78	34	40	32	35	15	15	34	120	55	35	107	112	36	0	0
Platinum	17	17	11	0	17	4	0	17	29	0	17	18	0	17	10	0
S. Kuskokwim Bay	267	141	504	165	142	104	81	141	387	136	142	374	155	142	12	3
Survey Total	4,163	1,777	3,754	513	1,765	3,862	1,146	1,769	4,365	494	1,772	4,679	600	1,779	235	130

Note: Dashes indicate data are unavailable. N = the total number of households, n = the number of households surveyed, CI (95)% = 95% confidence interval.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 14.–Number of fish reported as received from commercial fisheries, Kuskokwim Area, 2016.

Community	Chinook			Chum			Sockeye			Coho			Pink		
	N	n	Estimate CI(95%)	n	Estimate	CI(95%)	n	Estimate	CI(95%)	n	Estimate	CI(95%)	n	Estimate	CI(95%)
Kongiganak	90	0	– –	0	–	–	0	–	–	0	–	–	0	–	–
N. Kuskokwim Bay	90	0	– –	0	–	–	0	–	–	0	–	–	0	–	–
Tuntutuliak	106	64	0 0	64	0	0	64	0	0	64	0	0	64	0	0
Eek	96	43	0 0	43	0	0	43	0	0	43	0	0	43	0	0
Kasigluk	114	56	0 0	56	0	0	56	0	0	56	0	0	56	0	0
Nunapitchuk	121	64	0 0	64	0	0	64	0	0	64	0	0	64	0	0
Atmautluak	67	37	0 0	37	0	0	37	0	0	37	0	0	37	0	0
Napakiak	100	49	0 0	49	0	0	49	0	0	49	0	0	49	0	0
Napaskiak	107	57	0 0	57	0	0	57	0	0	57	0	0	57	0	0
Oscarville	15	15	0 0	15	0	0	15	0	0	15	0	0	15	0	0
Bethel	1,913	589	0 0	589	0	0	589	0	0	589	0	0	589	0	0
Kwethluk	172	63	0 0	63	0	0	63	0	0	63	0	0	63	0	0
Akiachak	165	87	0 0	87	0	0	87	0	0	87	0	0	87	0	0
Akiak	88	40	0 0	40	0	0	40	0	0	40	0	0	40	0	0
Tuluksak	97	45	0 0	45	0	0	45	0	0	45	0	0	45	0	0
Lower Kuskokwim	3,161	1,209	0 0	1,209	0	0	1,209	0	0	1,209	0	0	1,209	0	0
Lower Kalskag	84	41	0 0	41	0	0	41	0	0	41	0	0	41	0	0
Upper Kalskag	62	36	0 0	36	0	0	36	0	0	36	0	0	36	0	0
Aniak	178	159	0 0	159	0	0	159	0	0	159	0	0	159	0	0
Chuathbaluk	31	28	0 0	28	0	0	28	0	0	28	0	0	28	0	0
Middle Kuskokwim	355	264	0 0	264	0	0	264	0	0	264	0	0	264	0	0
Crooked Creek	36	26	0 0	26	0	0	26	0	0	26	0	0	26	0	0
Red Devil	8	5	0 0	5	0	0	5	0	0	5	0	0	5	0	0
Sleetmute	34	24	0 0	24	0	0	24	0	0	24	0	0	24	0	0
Stony River	13	12	0 0	12	0	0	12	0	0	12	0	0	12	0	0
Lime Village	9	9	0 0	9	0	0	9	0	0	9	0	0	9	0	0
McGrath	127	64	0 0	64	0	0	64	0	0	64	0	0	64	0	0
Takotna	25	19	0 0	19	0	0	19	0	0	19	0	0	19	0	0
Nikolai	36	35	0 0	35	0	0	35	0	0	35	0	0	35	0	0
Telida	2	0	– –	0	–	–	0	–	–	0	–	–	0	–	–
Upper Kuskokwim	290	194	0 0	194	0	0	194	0	0	194	0	0	194	0	0
Kuskokwim Rivera	3,896	1,667	0 0	1,667	0	0	1,667	0	0	1,667	0	0	1,667	0	0
Quinhagak	172	89	0 0	89	0	0	89	0	0	89	0	0	89	0	0
Goodnews Bay	78	34	0 0	34	0	0	34	0	0	34	0	0	34	0	0
Platinum	17	15	0 0	15	0	0	15	0	0	15	0	0	15	0	0
S. Kuskokwim Bay	267	138	0 0	138	0	0	138	0	0	138	0	0	138	0	0
Survey Total	4,163	1,805	0 0	1,805	0	0	1,805	0	0	1,805	0	0	1,805	0	0

Note: Dashes indicate data are unavailable. N = the total number of households, n = the number of households surveyed, CI (95)% = 95% confidence interval.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 15.—Number of fish reported as received from commercial fisheries, Kuskokwim Area, 2016.

Community	Own dog	Feed salmon	# dogs	Chinook	Chum	Sockeye	Coho	Pink
Kongiganak	—	—	—	—	—	—	—	—
N. Kuskokwim Bay	—	—	—	—	—	—	—	—
Tuntutuliak	89	64	191	11	22	11	0	0
Eek	66	43	117	0	0	0	117	0
Kasigluk	69	59	158	0	0	0	0	0
Nunapitchuk	73	67	204	0	99	11	0	1
Atmautluak	56	36	174	0	0	0	0	0
Napakiak	66	49	118	0	0	0	0	0
Napaskiak	64	58	210	0	273	42	0	42
Oscarville	10	15	13	0	2	0	1	3
Bethel	840	574	1,470	0	1,603	17	837	50
Kwethluk	144	63	406	0	0	0	0	31
Akiachak	95	87	229	0	89	139	439	0
Akiak	61	40	340	0	1,444	0	112	19
Tuluksak	73	45	216	0	176	0	0	4
Lower Kuskokwim	1,705	1,200	3,846	11	3,708	219	1,504	150
Lower Kalskag	55	43	140	0	6	0	0	0
Upper Kalskag	46	37	134	0	497	0	416	66
Aniak	113	159	320	0	1,845	6,824	6,605	461
Chuathbaluk	22	28	46	0	34	0	0	0
Middle Kuskokwim	237	267	640	0	2,382	6,824	7,021	527
Crooked Creek	25	25	47	0	455	0	0	0
Red Devil	8	5	15	0	0	0	0	0
Sleetmute	22	25	39	0	73	0	226	12
Stony River	8	12	11	0	11	0	0	11
Lime Village	2	9	6	0	0	0	0	0
McGrath	75	64	200	141	57	64	105	0
Takotna	18	19	48	0	0	0	0	0
Nikolai	25	36	76	50	195	30	590	7
Telida	—	—	—	—	—	—	—	—
Upper Kuskokwim	183	195	443	191	791	94	921	31
Kuskokwim River <sup>a</sup>	2,125	1,662	4,929	202	6,881	7,138	9,446	708
Quinhagak	98	92	170	0	0	0	44	0
Goodnews Bay	36	36	101	0	2	4	0	0
Platinum	9	17	17	0	0	0	0	2
S. Kuskokwim Bay	144	145	287	0	2	4	44	2
Survey Total	2,269	1,807	5,216	202	6,883	7,142	9,490	710

Note: Dashes indicate data are unavailable, # dog = number of dogs reported / owned by the respondent

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 16.—Number of salmon, by species reported as lost due to spoilage, animals, etc., Kuskokwim Area, 2016.

Community	N	Households						Reason given for loss				
		n reporting lost	Chinook	Chum	Coho	Sockeye	Animal	Disease	Human	Weather	Unknown	
Kongiganak	90	0	—	—	—	—	—	—	—	—	—	—
N. Kuskokwim Bay	90	0	—	—	—	—	—	—	—	—	—	—
Tuntutuliak	106	68	6	14	20	0	12	0	1	0	4	1
Eek	96	49	6	16	84	0	51	0	0	0	6	0
Kasigluk	114	64	3	2	13	0	11	0	0	0	3	0
Nunapitchuk	121	67	11	11	91	15	51	0	1	1	8	1
Atmautluak	67	41	4	12	77	0	91	0	0	1	3	0
Napakiak	100	53	12	41	200	0	109	0	1	0	11	0
Napaskiak	107	60	4	13	16	0	11	1	2	0	1	0
Oscarville	15	15	2	0	10	0	10	0	0	0	2	0
Bethel	1,913	696	35	280	356	325	466	1	1	6	22	1
Kwethluk	172	71	10	14	161	15	136	0	0	1	9	0
Akiachak	165	89	21	152	94	51	139	0	4	0	15	2
Akiak	88	53	10	56	88	10	128	0	2	0	7	1
Tuluksak	97	50	7	0	183	0	82	0	0	1	5	1
Lower Kuskokwim	3,161	1,376	131	612	1,395	416	1,298	2	12	10	96	7
Lower Kalskag	84	46	3	22	27	2	11	0	2	0	1	0
Upper Kalskag	62	37	4	16	110	83	18	1	0	0	2	0
Aniak	178	168	8	21	2	95	42	1	2	1	1	1
Chuathbaluk	31	30	0	0	0	0	0	0	0	0	0	0
Middle Kuskokwim	355	281	15	60	139	181	70	2	4	1	4	1
Crooked Creek	36	30	2	9	0	0	0	0	0	0	2	0
Red Devil	8	5	0	0	0	0	0	0	0	0	0	0
Sleetmute	34	27	2	7	8	18	14	0	0	0	2	0
Stony River	13	12	1	0	0	0	7	0	1	0	0	0
Lime Village	9	9	1	0	0	0	80	0	0	0	1	0
McGrath	127	66	3	7	0	32	0	1	0	0	2	0
Takotna	25	22	0	0	0	0	0	0	0	0	0	0
Nikolai	36	36	4	25	0	0	0	0	0	0	4	0
Telida	2	0	—	—	—	—	—	—	—	—	—	—
Upper Kuskokwim	290	207	13	47	8	51	101	1	1	0	11	0
Kuskokwim River <sup>a</sup>	3,806	3,728	159	720	1,542	647	1,469	5	17	11	111	8
Quinhagak	172	95	11	43	33	89	13	0	3	0	7	1
Goodnews Bay	78	37	6	6	0	0	143	0	1	0	5	0
Platinum	17	17	2	0	0	5	15	0	0	0	2	0
S. Kuskokwim Bay	267	149	19	50	33	94	171	0	4	0	14	1
Survey Total	4,163	2,013	178	769	1,575	741	1,640	5	21	11	125	9

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 17.—Comments provided by survey participants regarding the meeting of subsistence needs for Chinook salmon, 2016.

	Reasons given for reporting needs not met															
	Non-fishery related factors											Natural conditions				
	N	n	Needs met	No need	Total not met	Did not fish	Management				Run dynamics (-)	River conditions (-)	Weather (-)	Voluntary conservation	Human theft	Unknown
							Personal	Equipment	Expenses	(-)						
Kongiganak	90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
N. Kuskokwim Bay	90	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tuntutuliak	106	64	25	2	37	3	10	2	0	13	2	0	3	0	0	4
Eek	96	43	18	5	20	4	5	3	0	5	0	0	1	1	0	1
Kasigluk	114	59	12	5	42	1	15	5	0	15	0	0	0	0	0	6
Nunapitchuk	121	67	21	1	43	4	8	2	3	16	0	0	1	0	0	9
Atmautluak	67	37	12	3	22	1	2	3	3	8	0	0	0	0	0	5
Napakiak	100	48	22	3	23	0	9	7	0	2	1	0	0	0	0	4
Napaskiak	107	58	24	3	30	3	4	3	0	19	0	0	0	0	0	1
Oscarville	15	15	6	1	8	0	4	1	0	2	0	0	0	0	0	1
Bethel	1,913	587	189	164	231	25	102	34	3	33	3	0	3	8	1	19
Kwethluk	172	62	18	5	39	0	9	7	2	17	1	0	0	0	1	2
Akiachak	165	87	41	4	42	4	10	3	0	18	1	0	4	0	0	2
Akiak	88	40	14	0	26	2	7	3	1	9	1	0	0	1	0	2
Tuluksak	97	45	8	3	34	2	11	4	1	10	1	0	0	1	1	3
Lower Kuskokwim	3,578	1,212	410	199	597	49	196	77	13	167	10	0	12	11	3	59
Lower Kalskag	84	43	12	7	24	2	7	7	0	2	2	0	1	0	0	3
Upper Kalskag	62	37	11	5	21	0	7	4	0	8	2	0	0	0	0	0
Aniak	178	159	58	35	65	11	25	6	0	11	4	1	1	1	0	5
Chuathbaluk	31	28	8	7	13	2	7	2	0	0	0	0	0	0	0	2
Middle Kuskokwim	355	267	89	54	123	15	46	19	0	21	8	1	2	1	0	10
Crooked Creek	36	25	7	5	13	0	4	2	0	4	1	0	0	0	0	2
Red Devil	8	5	2	1	2	0	1	1	0	0	0	0	0	0	0	0
Sleetmute	34	25	14	1	10	1	2	2	1	2	0	1	0	0	0	1
Stony River	13	12	2	4	6	2	4	0	0	0	0	0	0	0	0	0
Lime Village	9	9	1	8	0	0	0	0	0	0	0	0	0	0	0	0
McGrath	127	62	10	15	37	15	14	3	0	0	0	3	0	0	0	2
Takotna	25	19	1	3	15	9	3	0	1	1	0	1	0	0	0	0
Nikolai	36	36	9	8	19	4	12	0	0	0	0	2	0	0	0	1
Telida	2	0	—	—	0	—	—	—	—	—	—	—	—	—	—	—
Upper Kuskokwim River	290	193	46	45	102	31	40	8	2	7	1	7	0	0	0	6
Kuskokwim River <sup>a</sup>	4,313	1,672	545	298	822	95	282	104	15	195	19	8	14	12	3	75

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Table 17.–Page 2 of 2.

	Reasons given for reporting needs not met															
	Non-fishery related factors										Natural conditions					
	N	n	Needs met	No need	Total not met	Did not fish	Management				Run (-)	River conditions (-)	Weather	Voluntary conservation	Human theft	Unknown
							Personal	Equipment	Expenses	(-)						
Quinhagak	172	92	65	3	24	3	12	2	1	0	0	0	1	0	0	5
Goodnews Bay	78	37	14	1	22	0	10	4	0	1	3	0	1	0	0	3
Platinum	17	17	4	2	11	0	5	1	0	2	1	0	0	0	0	2
S. Kuskokwim Bay	267	146	83	6	57	3	27	7	1	3	4	0	2	0	0	10
Survey Total	4,580	1,818	628	304	879	98	309	111	16	198	23	8	16	12	3	85

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 18.—Comments provided by survey participants regarding the meeting of subsistence needs for Chum salmon, 2016.

	Reporting needs not met															
	Non-fishery related factors									Natural conditions						
	N	n	Needs met	No need	Total needs not met	Did not fish	Personal	Equipment	Expenses	Management (-)	Run dynamics (-)	River conditions (-)	Weather	Voluntary conservation	Human theft	Unknown
Kongiganak	90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
N. Kuskokwim Bay	90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Tuntutuliak	106	64	34	7	23	2	8	0	0	5	3	0	2	0	0	3
Eek	96	42	12	13	17	3	6	2	0	4	0	0	1	0	0	1
Kasigluk	114	59	31	7	21	1	9	4	0	5	0	0	0	0	0	2
Nunapitchuk	121	66	28	3	33	5	6	2	4	11	1	0	2	0	0	2
Atmautluak	67	35	18	6	11	1	3	0	2	0	0	0	0	0	1	4
Napakiak	100	48	22	5	21	0	9	7	0	0	1	0	0	0	0	4
Napaskiak	107	58	30	4	24	3	3	3	0	13	0	0	0	0	0	2
Oscarville	15	15	8	2	5	0	3	1	0	0	0	0	0	0	0	1
Bethel	1,913	582	194	210	176	21	83	31	3	10	1	0	2	1	0	24
Kwethluk	172	62	36	5	21	0	5	4	1	7	1	0	0	0	1	2
Akiachak	165	86	57	10	18	2	6	3	0	7	0	0	0	0	0	0
Akiak	88	40	14	4	22	2	6	3	1	7	0	0	0	1	0	2
Tuluksak	97	44	15	3	26	2	8	4	1	7	1	0	0	1	1	1
Lower Kuskokwim	3,578	1,201	499	279	418	42	155	64	12	76	8	0	7	3	3	48
Lower Kalskag	84	43	9	12	22	2	8	7	0	1	1	0	0	0	0	3
Upper Kalskag	62	37	18	12	7	0	4	2	0	1	0	0	0	0	0	0
Aniak	178	159	35	83	41	9	13	8	0	4	2	0	1	1	0	3
Chuathbaluk	31	28	5	11	12	2	6	2	0	0	0	0	0	0	0	2
Middle Kuskokwim	355	267	67	118	82	13	31	19	0	6	3	0	1	1	0	8
Crooked Creek	36	25	8	6	11	0	4	3	0	1	1	0	1	0	0	1
Red Devil	8	5	3	0	2	0	1	1	0	0	0	0	0	0	0	0
Sleetmute	34	25	6	13	6	1	1	1	1	1	0	1	0	0	0	0
Stony River	13	12	1	6	5	2	3	0	0	0	0	0	0	0	0	0
Lime Village	9	9	3	6	0	0	0	0	0	0	0	0	0	0	0	0
McGrath	127	63	4	29	30	11	14	3	0	0	0	2	0	0	0	0
Takotna	25	19	0	4	15	10	3	0	1	0	0	1	0	0	0	0
Nikolai	36	36	0	24	12	2	7	0	0	0	1	1	0	0	0	1
Telida	2	0	—	—	0	—	—	—	—	—	—	—	—	—	—	0
Upper Kuskokwim	290	194	25	88	81	26	33	8	2	2	2	5	1	0	0	2
Kuskokwim River <sup>a</sup>	4,313	1,662	591	485	581	81	219	91	14	84	13	5	9	4	3	58

-continued-



Table 18.–Page 2 of 2.

	Reporting needs not met															
	Non-fishery related factors									Natural conditions						
	N	n	Needs met	No need	Total needs not met	Did not fish	Personal	Equipment	Expenses	Management (-)	Run dynamics (-)	River conditions (-)	Weather	Voluntary conservation	Human theft	Unknown
Quinhagak	172	92	43	29	20	6	8	0	0	0	0	0	0	0	0	6
Goodnews Bay	78	37	9	15	13	0	6	1	0	1	1	0	0	0	0	4
Platinum	17	17	4	5	8	1	5	1	0	1	0	0	0	0	0	0
S. Kuskokwim Bay	267	146	56	49	41	7	19	2	0	2	1	0	0	0	0	10
Survey Total	4,580	1,808	647	534	622	88	238	93	14	86	14	5	9	4	3	68

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 19.–Comments provided by survey participants regarding the meeting of subsistence needs for Sockeye salmon, 2016.

	Reporting needs not met															
	Non-fishery related factors										Natural conditions					
	N	n	Needs met	No need	Total needs not met	Did not fish	Management dynamics				Run River		Weather conservation	Voluntary Human	Unknown	
							Personal	Equipment	Expenses	(-)	(-)	(-)				
Kongiganak	90	0	–	–	–	–	–	–	–	–	–	–	–	–	–	0
N. Kuskokwim Bay	90	0	–	–	–	–	–	–	–	–	–	–	–	–	–	0
Tuntutuliak	106	64	39	2	23	2	8	2	0	5	2	0	1	0	0	3
Eek	96	42	13	6	23	4	9	2	0	4	1	0	2	0	0	1
Kasigluk	114	59	26	7	26	1	13	4	0	3	0	0	0	0	0	5
Nunapitchuk	121	66	28	2	35	4	7	2	4	11	0	0	3	0	0	4
Atmautluak	67	36	18	2	16	2	1	1	4	4	0	0	0	0	1	3
Napakiak	100	49	27	1	21	0	11	6	0	0	0	0	0	0	0	4
Napaskiak	107	58	32	1	25	3	4	3	0	13	0	0	0	0	0	2
Oscarville	15	15	7	1	7	0	4	1	0	0	0	0	0	0	0	2
Bethel	1,913	583	228	154	197	26	95	30	3	13	1	0	2	1	0	26
Kwethluk	172	62	34	8	20	0	8	3	0	7	0	0	0	0	1	1
Akiachak	165	86	54	8	24	3	9	2	0	7	0	0	2	0	0	1
Akiak	88	40	16	1	23	2	7	3	1	8	0	0	0	1	0	1
Tuluksak	97	45	14	3	28	2	8	4	1	8	1	0	0	1	1	2
Lower Kuskokwim	3,161	1,205	536	196	468	49	184	63	13	83	5	0	10	3	3	55
Lower Kalskag	84	43	13	9	21	2	7	7	0	1	2	0	0	0	0	2
Upper Kalskag	62	36	16	7	13	0	5	5	0	2	1	0	0	0	0	0
Aniak	178	159	46	51	61	11	23	8	0	5	4	2	1	1	0	6
Chuathbaluk	31	28	10	5	12	2	6	1	0	0	0	0	0	0	0	3
Middle Kuskokwim	355	266	85	72	107	15	41	21	0	8	7	2	1	1	0	11
Crooked Creek	36	25	7	4	14	1	5	3	0	2	2	0	0	0	0	1
Red Devil	8	5	3	0	2	0	1	1	0	0	0	0	0	0	0	0
Sleetmute	34	25	18	1	6	1	1	1	1	1	0	1	0	0	0	0
Stony River	13	12	3	3	6	2	4	0	0	0	0	0	0	0	0	0
Lime Village	9	9	9	0	–	0	0	0	0	0	0	0	0	0	0	0
McGrath	127	62	8	20	34	11	15	3	0	0	1	2	0	0	0	2
Takotna	25	19	1	4	14	9	3	0	1	0	0	1	0	0	0	0
Nikolai	36	36	1	22	13	2	7	0	0	0	1	1	0	0	0	2
Telida	2	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	290	193	50	54	89	26	36	8	2	3	4	5	0	0	0	5
Kuskokwim River <sup>a</sup>	3,806	1,664	671	322	664	90	261	92	15	94	16	7	11	4	3	71

-continued-

Table 19.–Page 2 of 2.

	Reporting needs not met															
	Non-fishery related factors										Natural conditions					
	N	n	Needs met	No need	Total needs not met	Did not fish	Management				Run		River		Voluntary	
							Personal	Equipment	Expenses	(-)	(-)	(-)	Weather conservation	Human	Unknown	
Quinhagak	172	92	50	14	28	6	10	1	0	0	3	0	0	0	0	8
Goodnews Bay	78	37	13	1	23	1	9	5	0	2	1	0	2	0	0	3
Platinum	17	17	6	1	10	0	6	2	0	1	0	0	1	0	0	0
S. Kuskokwim Bay	267	146	69	16	61	7	25	8	0	3	4	0	3	0	0	11
Survey Total	4,163	1,810	740	338	725	97	286	100	15	97	20	7	14	4	3	82

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 20.—Comments provided by survey participants regarding the meeting of subsistence needs for Coho salmon, 2016.

	Reporting needs not met															
	Non-fishery related factors										Natural conditions					
	Needs		Total needs		Did not		Personal Equipment Expenses		Management dynamics		Run River		Voluntary		Human Unknown	
	N	n	met	No need	not met	fish	Personal	Equipment	Expenses	(-)	(-)	(-)	Weather conservation	Human	Unknown	
Kongiganak	90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
N. Kuskokwim Bay	90	0	—	—	—	—	—	—	—	—	—	—	—	—	—	
Tuntutuliak	106	64	14	16	34	8	10	2	0	2	1	1	4	0	0	6
Eek	96	42	10	7	25	4	11	3	0	2	1	0	3	0	0	1
Kasigluk	114	59	9	16	34	3	16	8	0	1	0	0	1	0	0	5
Nunapitchuk	121	65	12	13	40	10	13	1	6	4	1	0	2	0	0	3
Atmautluak	67	35	4	12	19	5	4	4	2	0	0	0	1	0	0	3
Napakiak	100	48	14	11	23	1	10	8	0	0	0	0	1	0	0	3
Napaskiak	107	58	25	9	24	3	3	4	0	12	1	0	0	0	0	1
Oscarville	15	15	10	1	4	0	2	1	0	0	0	0	0	0	0	1
Bethel	1,913	579	227	159	191	23	89	35	3	11	3	1	2	1	0	23
Kwethluk	172	61	20	9	32	1	15	7	1	3	0	2	2	0	0	1
Akiachak	165	86	39	15	32	8	9	3	1	3	1	0	4	0	0	3
Akiak	88	40	15	3	22	2	5	4	1	7	0	0	0	1	0	2
Tuluksak	97	43	6	10	27	2	10	5	1	5	0	0	0	1	1	2
Lower Kuskokwim	3,161	1,195	405	281	507	70	197	85	15	50	8	4	20	3	1	54
Lower Kalskag	84	43	6	14	23	3	8	7	0	1	1	0	0	0	0	3
Upper Kalskag	62	37	14	14	9	0	4	3	0	1	0	0	0	1	0	0
Aniak	178	159	50	52	56	13	21	8	0	4	2	1	3	1	0	3
Chuathbaluk	31	28	10	7	11	1	6	2	0	0	0	0	0	0	0	2
Middle Kuskokwim	355	267	80	87	99	17	39	20	0	6	3	1	3	2		8
Crooked Creek	36	25	7	5	13	1	5	3	0	0	0	2	1	0	0	1
Red Devil	8	5	3	0	2	0	1	1	0	0	0	0	0	0	0	0
Sleetmute	34	25	13	6	6	1	2	1	1	0	0	1	0	0	0	0
Stony River	13	12	1	4	7	1	4	0	0	0	0	1	0	0	0	1
Lime Village	9	9	3	6	0	0	0	0	0	0	0	0	0	0	0	0
McGrath	127	62	13	15	34	10	16	3	0	0	0	4	0	0	0	1
Takotna	25	19	5	1	13	7	2	0	1	0	0	2	0	0	0	1
Nikolai	36	36	2	22	12	2	8	0	0	0	0	1	0	0	0	1
Telida	2	0	—	—	0	—	—	—	—	—	—	—	—	—	—	—
Upper Kuskokwim	290	193	47	59	87	22	38	8	2	0	0	11	1	0	0	5
Kuskokwim River <sup>a</sup>	3,896	1,655	532	427	693	109	274	113	17	56	11	16	24	5	1	67

-continued-

Table 20.–Page 2 of 2.

	Reporting needs not met																
	Non-fishery related factors										Natural conditions						
	N	n	Needs		Total needs not met	Did not fish	Management dynamics				Run		River		Voluntary		
			met	No need			Personal	Equipment	Expenses	(-)	(-)	(-)	Weather conservation	Human	Unknown		
Quinhagak	172	92	42	23	27	5	12	1	0	0	1	0	0	0	0	0	8
Goodnews Bay	78	37	11	1	24	3	10	4	0	1	1	0	0	0	0	0	5
Platinum	17	17	3	1	13	1	8	2	0	1	0	0	0	0	0	0	1
S. Kuskokwim Bay	267	146	56	25	64	9	30	7	0	2	2	0	0	0	0	0	14
Survey Total	4,163	1,801	588	452	757	118	304	120	17	58	13	16	24	5	1	81	

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed.

<sup>a</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 21.—Estimated harvest of non-salmon fish, including those caught in the winter prior to the survey season, Kuskokwim Area, 2016.

Community	Humpback whitefish		Broad whitefish		Cisco		Sheefish		Burbot		Pike	
	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)
Kongiganak	–	–	–	–	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	–	–	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	968	348	2,716	2,805	132	28	145	103	506	207	6,859	3,365
Eek	392	256	318	194	574	389	33	35	681	278	2,886	1,109
Kasigluk	2,421	633	7,010	1,591	223	212	84	56	227	83	5,562	1,580
Nunapitchuk	2,668	929	5,200	3,075	43	33	154	75	727	687	11,090	6,244
Atmautluak	803	200	1,439	370	25	23	60	28	206	112	2,090	750
Napakiak	2,156	1,582	2,952	1,708	191	229	294	169	1,264	860	10,457	3,368
Napaskiak	1,229	668	410	224	95	73	145	75	580	170	5,855	1,745
Oscarville	110	9	25	1	13	5	31	0	80	0	547	126
Bethel	5,169	1,809	3,967	2,258	595	563	1,683	935	3,849	1,569	34,527	8,119
Kwethluk	627	289	1,168	694	38	23	106	30	513	262	3,741	1,177
Akiachak	1,871	568	1,258	522	538	317	680	217	2,686	725	5,916	1,284
Akiak	8,186	12,361	2,300	2,446	1,775	2,480	594	406	10,792	10,023	3,932	2,009
Tuluksak	397	241	974	624	367	237	120	54	712	419	1,982	823
Lower Kuskokwim	26,997	12,308	29,737	5,823	4,609	2,549	4,129	1,064	22,823	9,952	95,444	11,810
Lower Kalskag	259	115	437	321	209	135	133	72	249	209	105	39
Upper Kalskag	333	106	659	129	252	171	194	66	78	11	167	89
Aniak	564	233	689	101	1,787	1,026	152	25	292	89	415	127
Chuathbaluk	36	11	48	15	18	7	38	4	5	5	1	1
Middle Kuskokwim	1,192	278	1,833	352	2,266	1,044	517	98	624	222	687	158
Crooked Creek	37	26	44	3	16	0	117	12	1	0	10	10
Red Devil	0	0	85	18	0	0	63	5	1	0	57	0
Sleetmute	198	52	181	54	635	342	117	46	17	18	48	4
Stony River	107	51	110	43	0	0	19	15	9	7	1	1
Lime Village	0	0	490	0	0	0	0	0	0	0	68	0
McGrath	121	76	260	195	163	148	498	359	20	13	409	355
Takotna	5	5	0	0	0	0	0	0	0	0	26	9
Nikolai	200	0	100	0	633	2	155	0	0	0	354	12
Telida	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	668	104	1,270	204	1,447	358	969	358	48	22	975	351
Kuskokwim River total	28,857	12,308	32,840	5,835	8,322	2,775	5,615	1,126	23,495	9,951	97,107	11,813
Quinhagak	72	25	212	99	1,122	694	18	8	107	155	1,359	855
Goodnews Bay	0	0	0	0	123	120	0	0	0	0	0	0
Platinum	0	0	1	0	51	0	0	0	0	0	0	0
S. Kuskokwim Bay	72	25	213	99	1,296	700	18	7	107	154	1,359	851
Survey Total	28,929	12,307	33,053	5,836	9,618	2,861	5,633	1,126	23,602	9,952	98,466	11,843

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed, CI (95%) is 95% confidence interval.

Table 22.—Estimated harvest of non-salmon fish, including those caught in the winter prior to the survey season, Kuskokwim Area, 2016.

Community	Blackfish		Grayling		Charr/Dolly Varden		Herring		Smelt		Rainbow	
	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)
Kongiganak	–	–	–	–	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	–	–	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	11,711	3,697	3	1	18	4	96	33	873	830	0	0
Eek	5,817	2,901	63	80	25	29	9,777	10,607	1,973	2,035	9	9
Kasigluk	6,632	3,473	4	6	0	0	0	0	1,828	986	4	6
Nunapitchuk	9,764	3,000	0	0	0	0	0	0	5,625	3,016	6	5
Atmautluak	4,117	3,456	0	0	0	0	0	0	2,167	862	9	12
Napakiak	5,218	3,919	0	0	2	4	0	0	8,516	3,274	0	0
Napaskiak	7,693	2,985	10	0	25	4	0	0	7,815	2,541	27	18
Oscarville	1,750	0	2	0	3	0	0	0	700	0	1	0
Bethel	24,320	15,594	199	121	321	238	2,102	2,099	75,383	15,649	609	355
Kwethluk	1,238	1,814	33	21	264	362	0	0	6,842	2,063	67	59
Akiachak	55,899	37,258	22	13	10	4	143	69	20,944	4,228	5	3
Akiak	4,200	6,942	105	124	49	20	0	0	15,179	5,039	45	22
Tuluksak	2,564	2,666	201	126	60	64	58	64	17,658	5,780	1	2
Lower Kuskokwim	140,921	41,547	642	225	778	434	12,176	10,531	165,505	18,785	785	361
Lower Kalskag	1,916	1,567	12	7	7	7	0	0	3,574	1,267	0	0
Upper Kalskag	4,128	1,755	0	0	5	4	0	0	6,148	2,109	3	4
Aniak	2,450	1,141	353	81	247	77	0	0	6,534	2,730	131	29
Chuathbaluk	0	0	232	15	9	6	0	0	1,288	557	0	0
Middle Kuskokwim	8,495	2,557	596	82	268	77	0	0	17,544	3,663	134	30
Crooked Creek	0	0	234	25	24	35	0	0	0	0	0	0
Red Devil	0	0	51	13	9	13	0	0	0	0	0	0
Sleetmute	0	0	254	149	1	1	0	0	0	0	0	0
Stony River	0	0	60	15	0	0	0	0	0	0	0	0
Lime Village	0	0	96	0	0	0	0	0	0	0	1	0
McGrath	367	144	971	309	10	7	0	0	0	0	5	7
Takotna	0	0	61	11	0	0	0	0	0	0	0	0
Nikolai	100	0	38	0	13	0	0	0	0	0	0	0
Telida	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	467	142	1,765	339	57	36	0	0	0	0	6	7
Kuskokwim River total	149,883	41,613	3,003	414	1,103	442	12,176	10,528	183,049	19,131	925	362
Quinhagak	14,545	9,319	229	90	4,058	1,212	3,497	2,792	9,220	2,130	356	182
Goodnews Bay	70	0	35	30	293	307	448	88	6,206	8,490	75	108
Platinum	0	0	100	0	200	0	494	0	133	0	1	0
S. Kuskokwim Bay	14,615	9,274	364	94	4,550	1,242	4,439	2,780	15,559	8,541	432	210
Survey Total	164,498	42,616	3,367	424	5,653	1,309	16,615	10,882	198,608	20,923	1,357	417

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed, CI (95%) is 95% confidence interval.

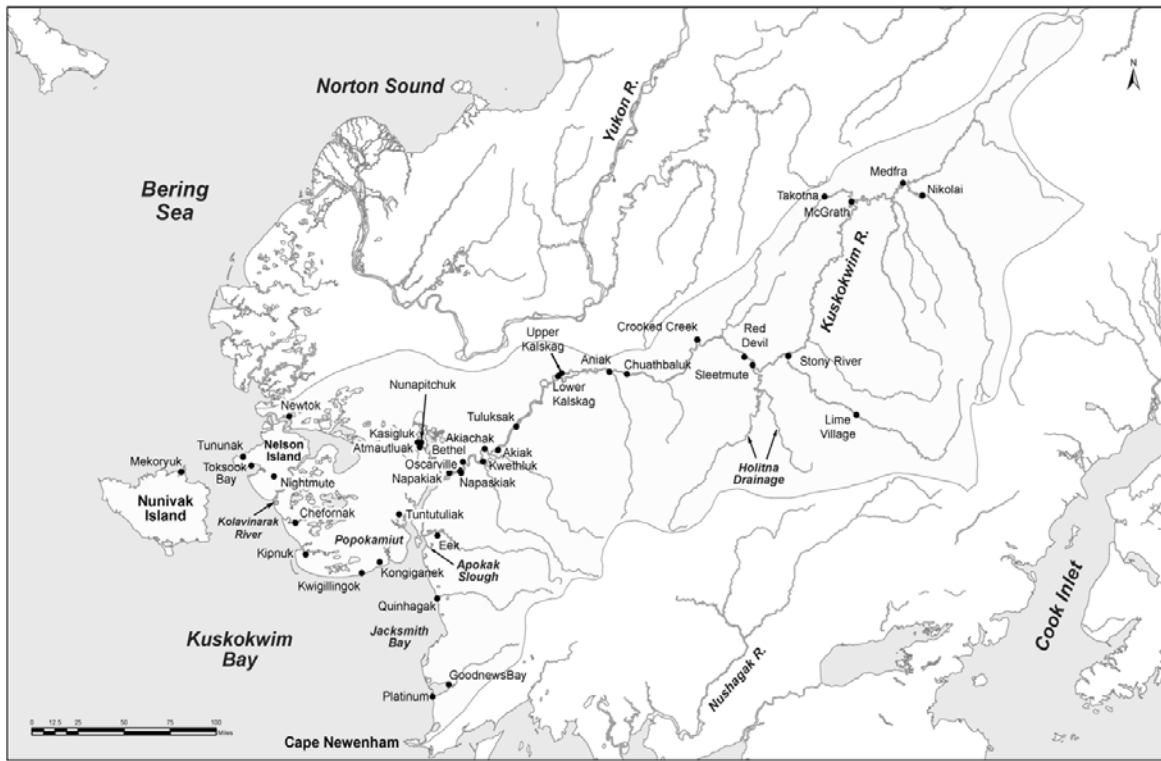


Figure 1.—Kuskokwim Management Area.

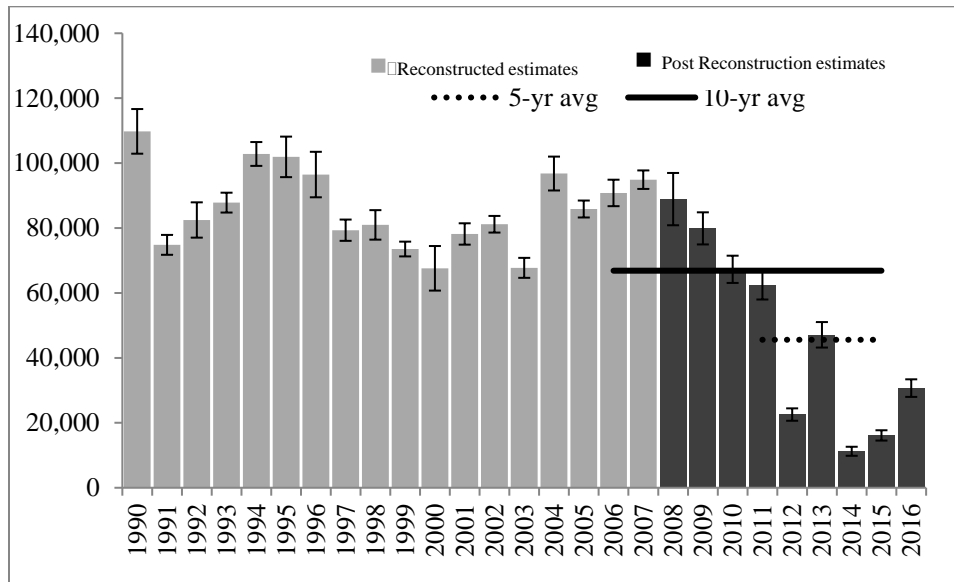


Figure 2.—Historical subsistence harvest estimates of Chinook salmon in the Kuskokwim River.



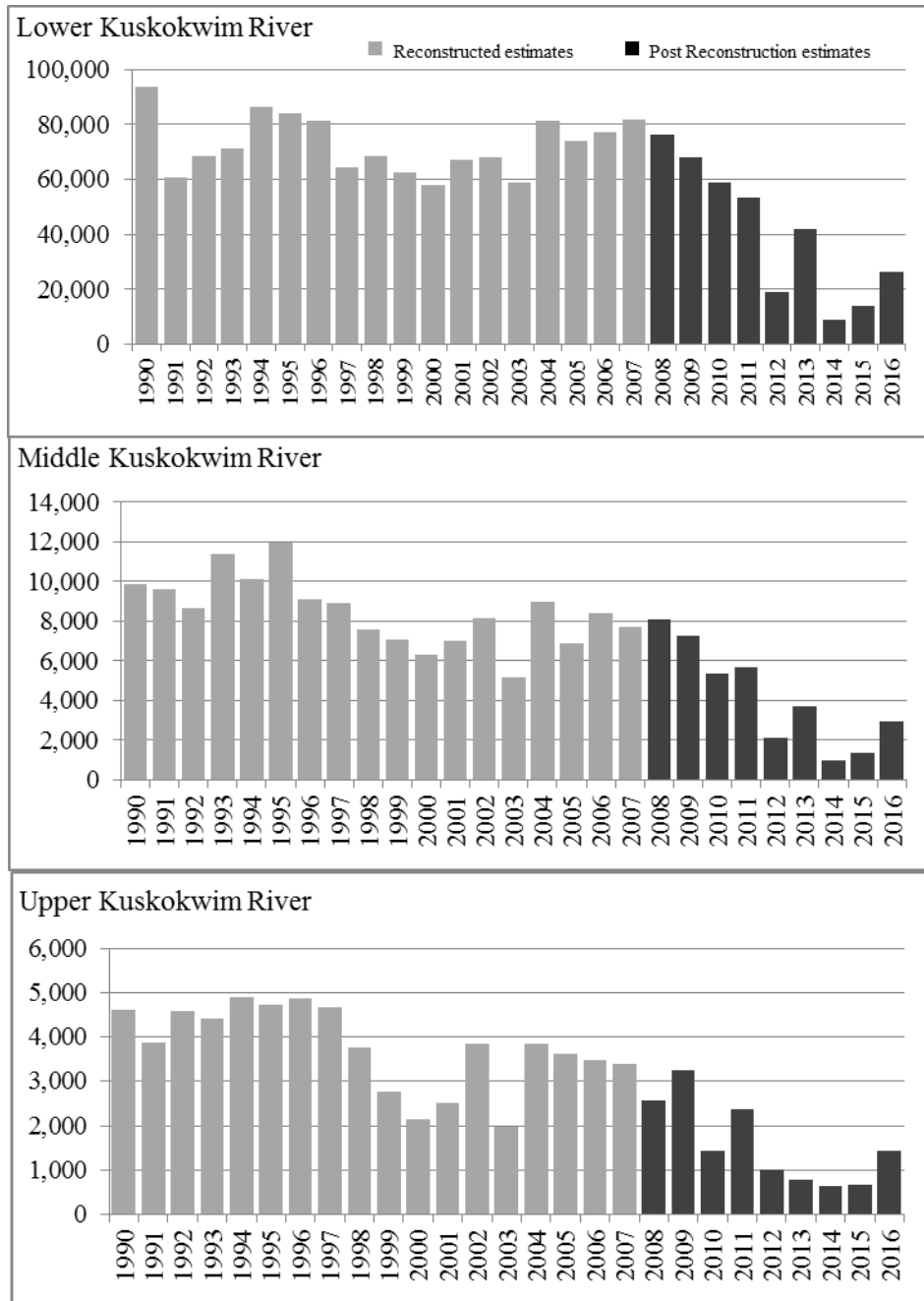


Figure 3.—Historical subsistence harvest estimates of Chinook salmon in the Kuskokwim River by sub-area.

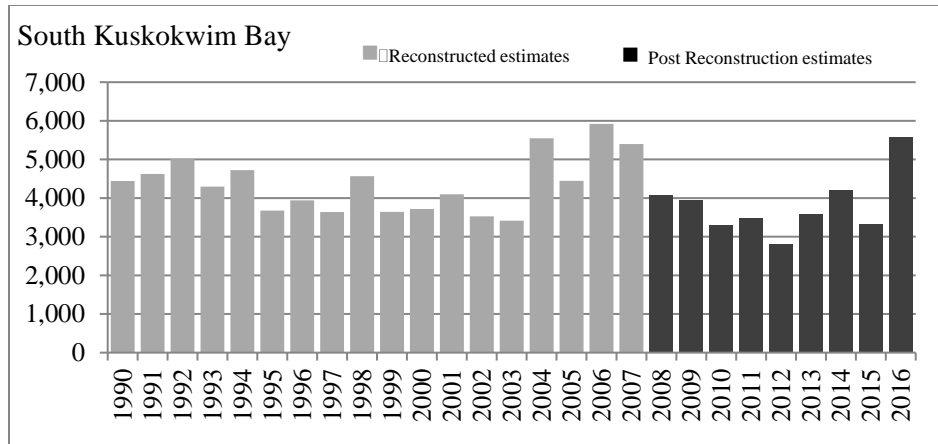


Figure 4.—Historical subsistence harvest estimates of Chinook salmon in the South Kuskokwim Bay by subarea.

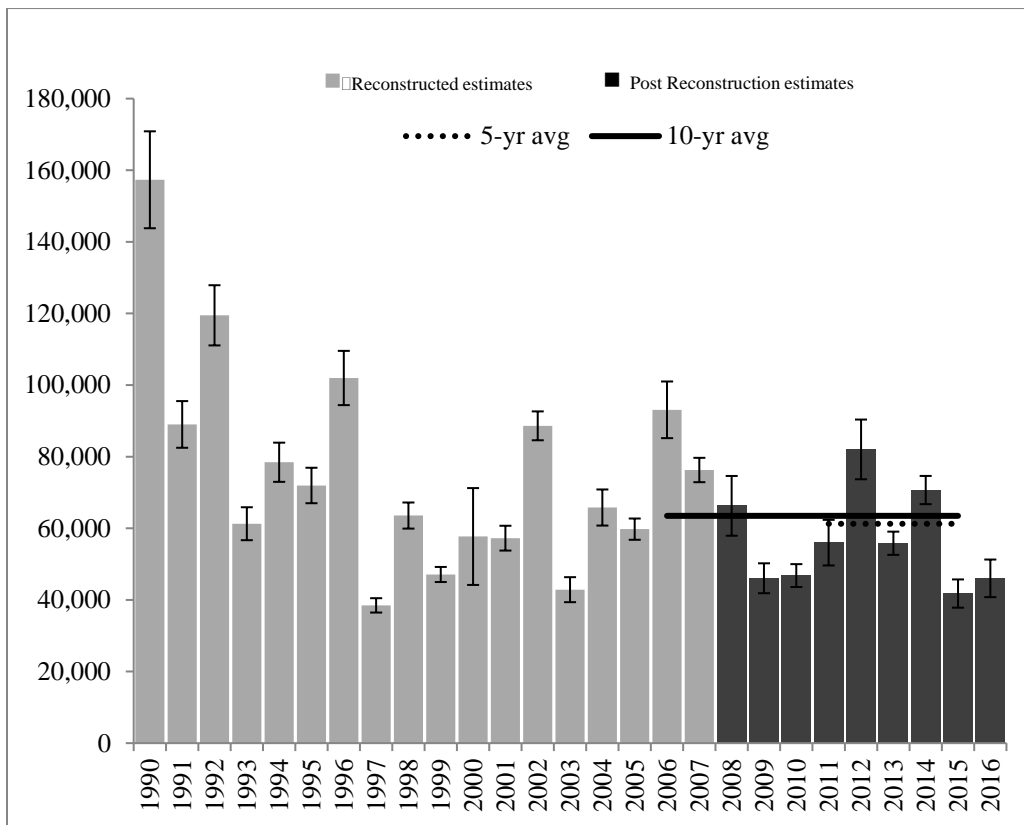


Figure 5.—Historical subsistence harvest estimates of chum salmon in the Kuskokwim Area (Kuskokwim River and Bay).

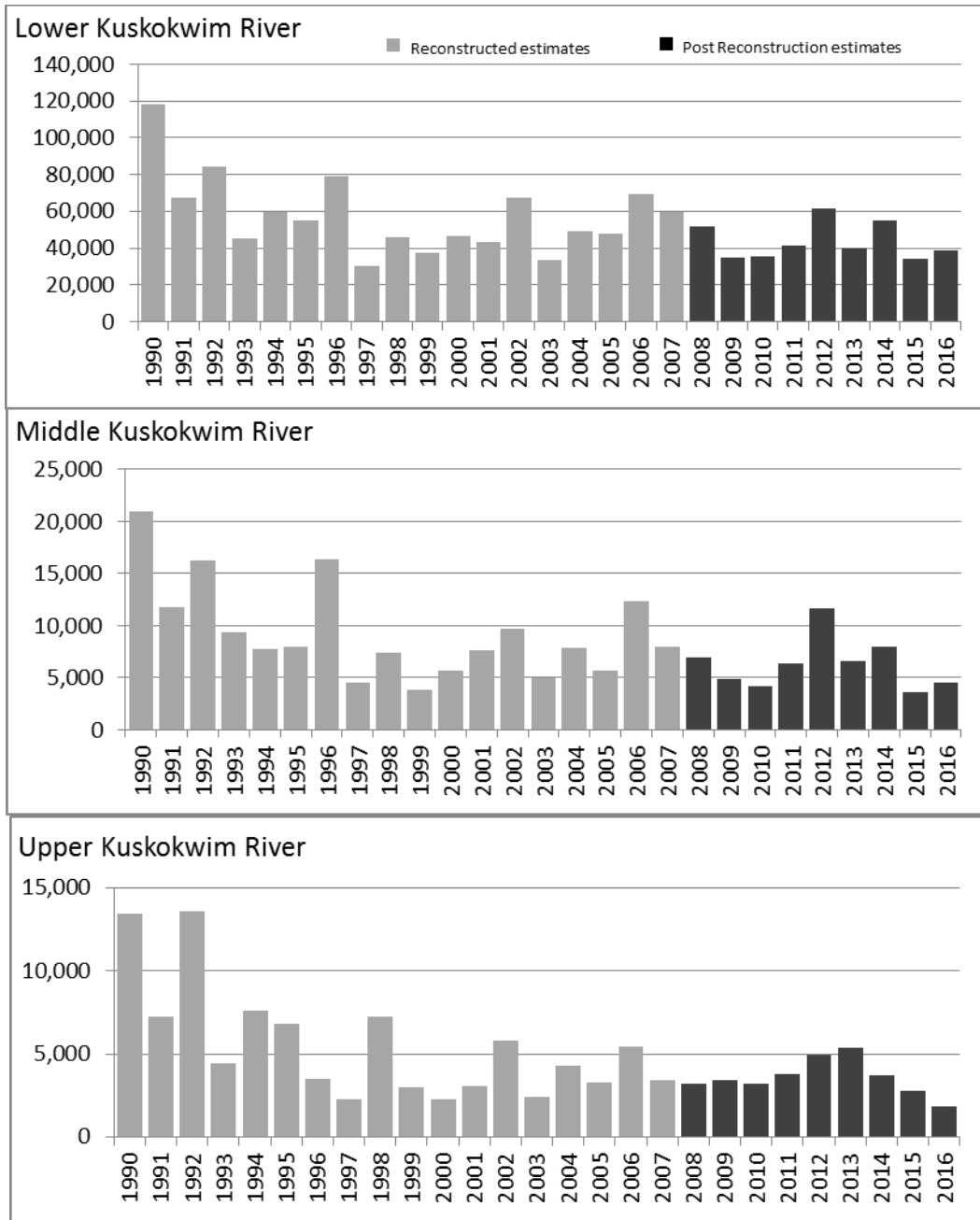


Figure 6.—Historical subsistence harvest estimates of chum salmon in the Kuskokwim River by sub-area.

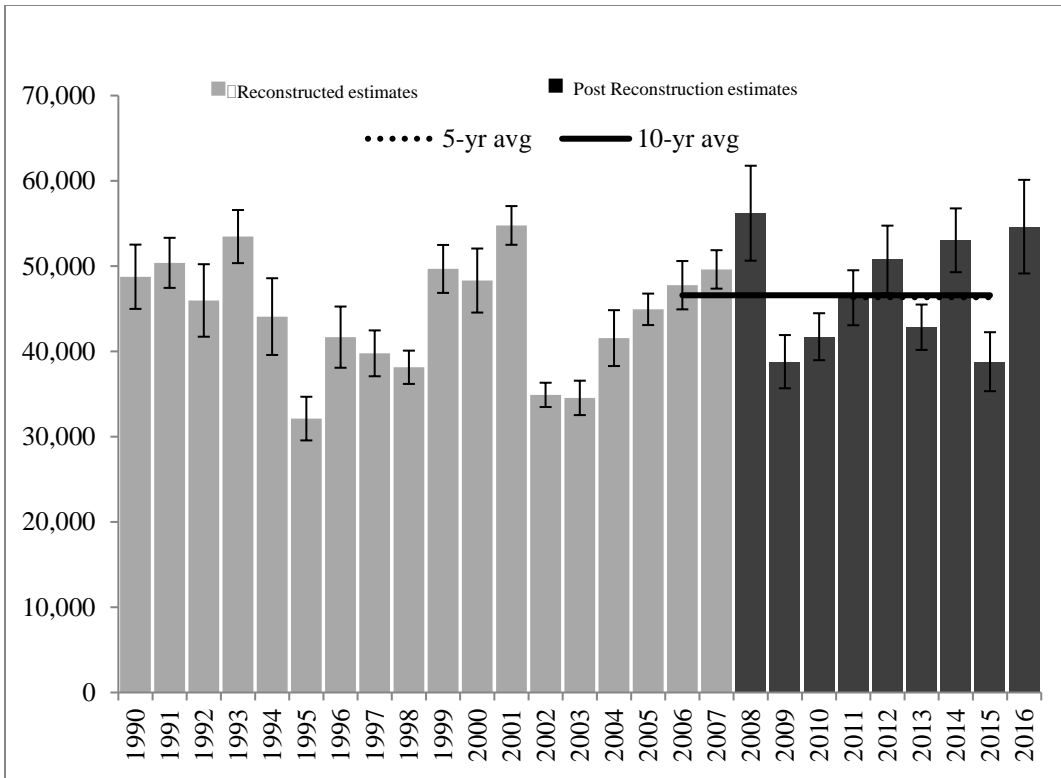


Figure 7.—Historical subsistence harvest estimates of sockeye salmon in the Kuskokwim Area.

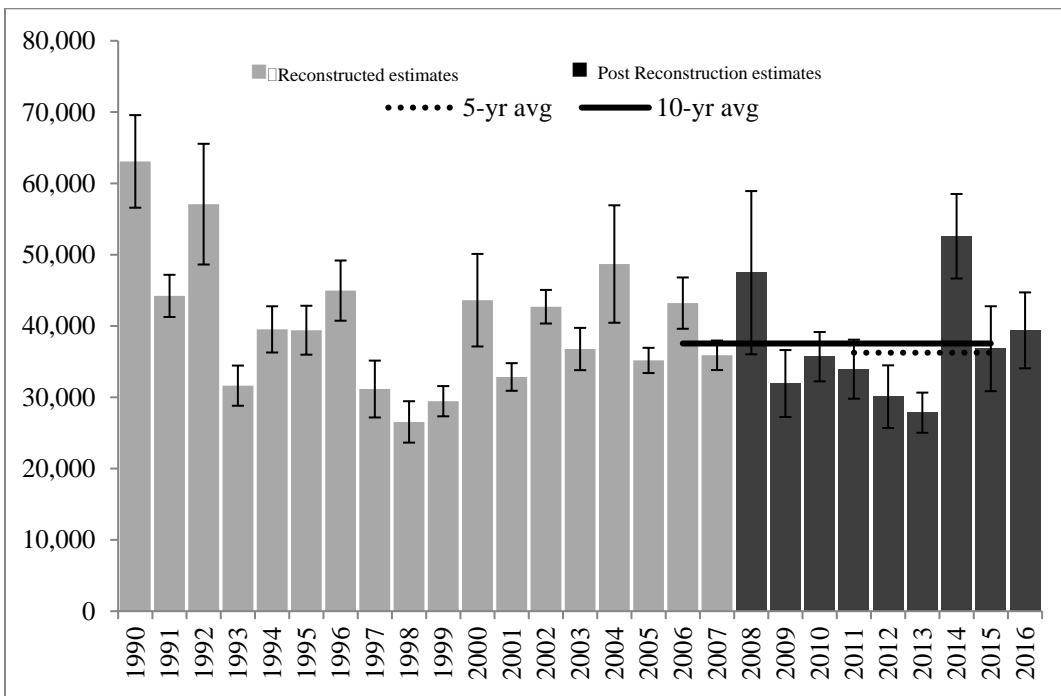


Figure 8.—Historical subsistence harvest estimates of coho salmon in the Kuskokwim Area.

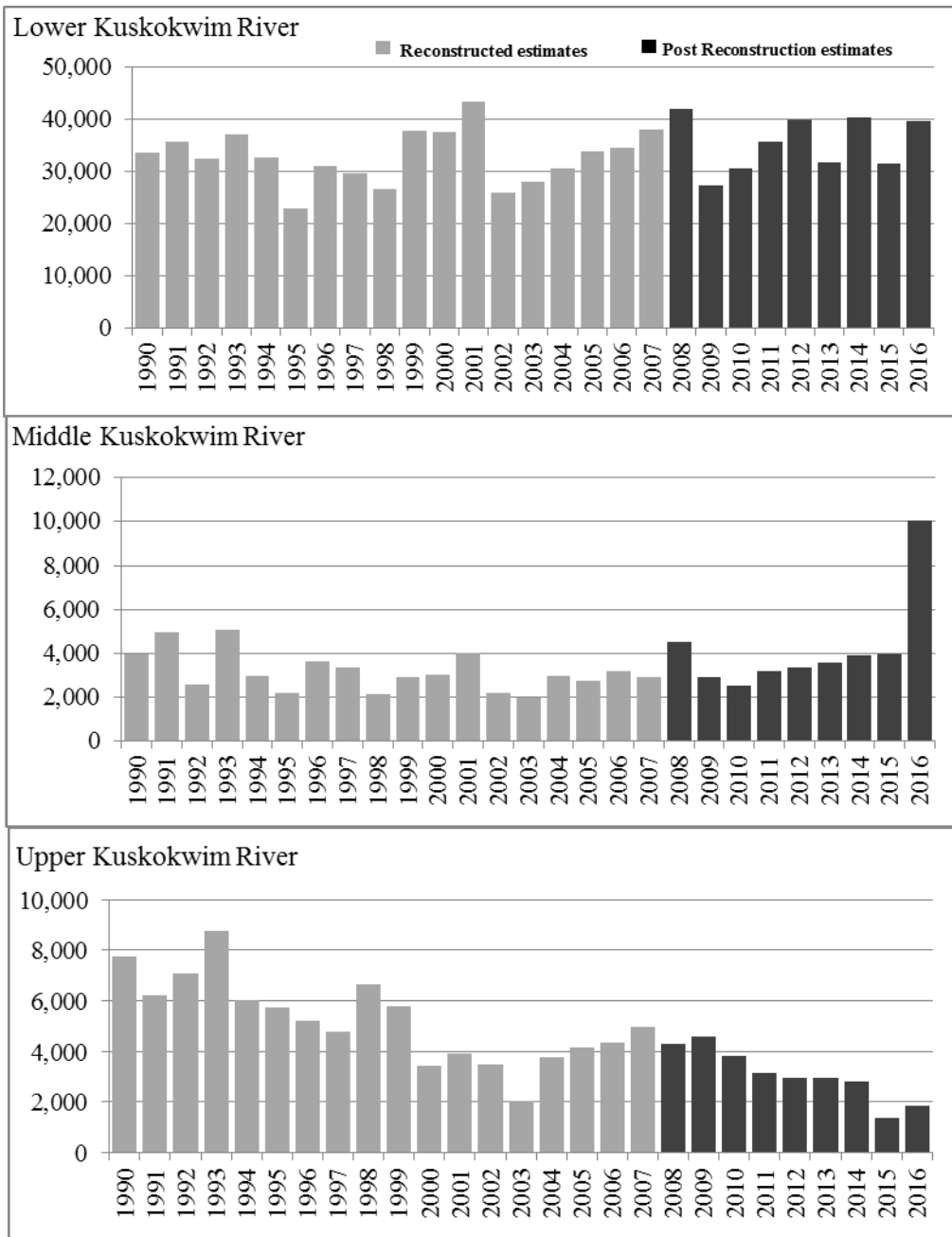


Figure 9.—Historical subsistence harvest estimates of sockeye salmon in the Kuskokwim River by sub-area.

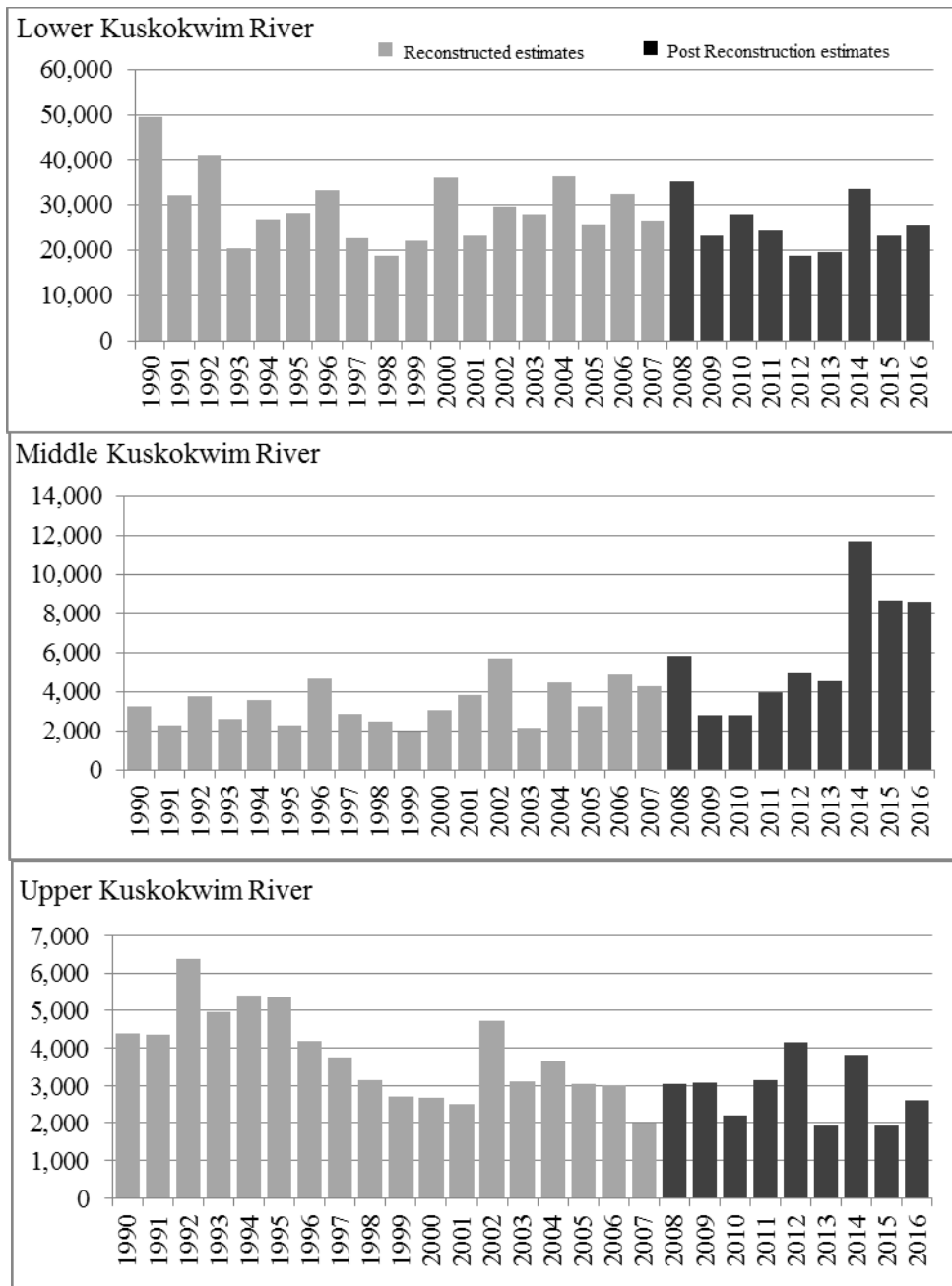


Figure 10.—Historical subsistence harvest estimates of coho salmon in the Kuskokwim River by sub-area.

**APPENDIX A: HISTORICAL SALMON HARVEST  
ESTIMATES**

Appendix A1.—Estimated number of Chinook salmon harvested for subsistence in the Kuskokwim area, 2006–2016.

Community	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2011–2015	Average 2006–2015
Kongiganak <sup>a</sup>	<b>1,729</b>	1,865	2,233	1,243	1,456	1,208	<b>287</b>	<b>641</b>	<b>964</b>	–	–	775	1,292
N. Kuskokwim Bay	1,729	1,865	2,233	1,243	1,456	1,208	287	641	964	0	0	620	1,163
Tuntutuliak	4,469	<b>4,614</b>	4,266	3,067	3,261	3,032	1,123	2,448	<b>574</b>	1,668	1,963	1,769	2,852
Eek	<b>2,501</b>	<b>2,512</b>	2,966	1,982	1,761	1,378	1,004	1,188	665	850	1,460	1,017	1,681
Kasigluk <sup>b</sup>	<b>4,905</b>	<b>5,167</b>	2,471	2,464	3,014	2,823	552	2,919	205	438	951	1,387	2,496
Nunapitchuk <sup>b</sup>	4,121	<b>4,661</b>	4,234	3,468	2,548	3,559	845	2,563	287	1,051	1,695	1,661	2,734
Atmaultluak <sup>b</sup>	1,758	<b>1,890</b>	1,298	1,567	1,088	1,236	234	1,592	108	514	763	737	1,128
Napakiak <sup>b</sup>	5,125	3,245	1,903	2,387	1,674	1,963	457	1,588	311	917	1,151	1,047	1,957
Napaskiak <sup>b</sup>	5,877	6,392	4,555	5,372	4,333	3,360	1,108	2,939	422	816	1,535	1,729	3,517
Oscarville <sup>b</sup>	1,052	1,360	1,351	754	618	694	51	585	68	120	208	304	665
Bethel <sup>c</sup>	27,805	30,422	27,800	26,170	26,157	25,093	7,321	17,246	3,089	4,918	9,462	11,533	19,602
Kwethluk <sup>b</sup>	7,258	6,466	8,451	7,130	4,440	2,467	1,709	3,192	959	900	1,731	1,845	4,297
Akiachak <sup>b</sup>	5,561	7,621	9,719	7,361	4,470	3,852	2,862	3,585	1,033	1,103	3,438	2,487	4,717
Akiak <sup>b</sup>	4,423	4,297	4,090	3,247	3,625	2,455	<b>1,218</b>	1,449	530	610	1,274	1,252	2,594
Tuluksak	<b>2,372</b>	3,266	2,937	3,212	2,057	1,230	651	732	404	231	709	650	1,709
Lower Kuskokwim	77,228	81,914	76,040	68,181	59,046	53,142	19,135	42,026	8,655	14,136	26,340	27,419	49,950
Lower Kalskag <sup>b</sup>	3,494	1,937	1,748	2,525	1,030	1,260	459	744	283	351	578	619	1,383
Upper Kalskag <sup>b</sup>	1,569	1,383	2,435	1,696	1,496	1,772	562	1,317	258	334	838	849	1,282
Aniak <sup>b</sup>	2,412	3,417	3,100	2,130	2,262	2,214	993	1,440	344	542	1,293	1,107	1,885
Chuathbaluk	<b>887</b>	973	772	877	551	409	103	155	90	90	203	169	491
Middle Kuskokwim	8,362	7,710	8,055	7,228	5,339	5,655	2,117	3,656	975	1,317	2,912	2,744	5,041
Crooked Creek	<b>736</b>	647	488	608	240	402	124	<b>145</b>	35	78	384	157	350
Red Devil	232	301	148	258	33	186	225	77	83	52	69	125	160
Sleetmute	750	861	933	693	272	242	132	96	58	137	169	133	417
Stony River	<b>288</b>	530	514	704	189	134	<b>151</b>	51	24	25	33	77	261
Lime Village <sup>a</sup>	<b>103</b>	<b>95</b>	<b>29</b>	<b>75</b>	<b>47</b>	<b>118</b>	29	<b>43</b>	<b>32</b>	–	35	55	63
McGrath <sup>b</sup>	689	495	288	600	262	829	68	95	173	75	384	248	357
Takotna	<b>0</b>	<b>10</b>	<b>0</b>	<b>8</b>	0	0	<b>0</b>	<b>0</b>	<b>0</b>	3	0	1	2
Nikolai	696	471	184	298	402	450	276	283	235	301	367	309	360
Telida <sup>a</sup>	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	3,494	3,409	2,584	3,244	1,445	2,361	1,005	790	640	671	1,441	1,093	1,964
Kuskokwim River <sup>d</sup>	90,812	94,898	88,912	79,896	67,286	62,366	22,544	47,113	11,234	16,124	30,693	31,876	58,118

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Appendix A1.–Page 2 of 2.

Community	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2011–2015	Average 2006–2015
Quinhagak	5,163	4,686	3,125	3,312	2,793	2,588	2,396	3,143	3,723	3,082	4,822	2,986	3,401
Goodnews Bay	<b>713</b>	647	898	569	480	834	389	413	431	220	654	457	559
Platinum	<b>45</b>	66	42	61	17	62	24	39	46	11	99	36	41
South Kuskokwim Bay	5,921	5,399	4,065	3,942	3,290	3,484	2,809	3,595	4,200	3,313	5,575	3,480	4,002
Total estimated harvest	96,733	100,297	92,977	83,838	70,576	65,850	25,353	50,708	15,434	19,437	36,268	35,356	62,120

*Note:* Dashes indicate harvest was not estimated. Bold indicates Bayesian estimates.

- <sup>a</sup> Villages not surveyed in 2015. Harvest was not estimated due to lack of recent data.
- <sup>b</sup> 2015 estimate includes a tally of Chinook salmon harvested under the USFWS issued permits.
- <sup>c</sup> The 2015 Bethel estimate contains both the permit numbers from Bethel and the seasonal village of Napaimute.
- <sup>d</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Appendix A2.—Estimated number of chum salmon harvested for subsistence in the Kuskokwim area, 2006–2016.

Community	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average 2011–2015	Average 2006–2015	
Kongiganak <sup>a</sup>	2,420	<b>2,353</b>	1,755	1,420	2,522	2,809	<b>1,638</b>	<b>1,397</b>	<b>1,915</b>	–	–	1,940	2,025
N. Kuskokwim Bay	2,420	2,353	1,755	1,420	2,522	2,809	1,638	1,397	1,915	0	0	1,552	1,823
Tuntutuliak	4,024	3,350	<b>3,375</b>	3,330	2,439	1,865	2,614	2,180	<b>2,967</b>	2,143	1,673	2,354	2,829
Eek	<b>1,075</b>	<b>783</b>	<b>788</b>	782	721	486	1,552	1,232	1,182	1,023	681	1,095	962
Kasigluk	<b>5,461</b>	<b>4,309</b>	<b>1,502</b>	1,857	2,338	2,029	3,261	2,197	3,612	2,080	1,485	2,636	2,865
Nunapitchuk	5,150	<b>6,619</b>	<b>4,705</b>	3,468	3,223	4,257	5,312	2,977	5,213	3,631	2,422	4,278	4,456
Atmautluak	<b>2,337</b>	2,193	<b>2,177</b>	1,665	1,386	1,864	2,701	2,409	3,327	2,165	1,609	2,493	2,222
Napakiak	8,143	3,628	1,313	1,638	1,759	1,546	1,711	1,185	2,392	1,508	2,091	1,668	2,482
Napaskiak	4,323	3,032	2,400	1,451	3,110	1,783	3,216	2,589	3,171	2,173	1,901	2,586	2,725
Oscarville	1,151	932	847	534	352	402	599	490	599	350	240	488	626
Bethel	20,953	16,540	15,853	10,055	9,575	15,324	26,872	12,506	18,017	10,958	13,494	16,735	15,665
Kwethluk	6,328	6,291	5,729	4,111	3,112	3,484	3,849	3,825	4,318	2,230	2,326	3,541	4,328
Akiachak	4,333	4,782	6,856	2,872	2,856	3,205	4,150	3,417	4,744	2,085	2,176	3,520	3,930
Akiak	3,095	4,141	3,522	1,350	1,163	2,421	<b>2,925</b>	2,212	2,982	2,348	5,803	2,578	2,616
Tuluksak	3,094	<b>3,202</b>	2,920	1,570	3,180	2,697	2,585	3,062	2,274	1,747	2,698	2,473	2,633
Lower Kuskokwim	69,466	59,803	51,988	34,683	35,214	41,363	61,347	40,281	54,798	34,441	38,599	46,446	48,338
Lower Kalskag	4,703	1,997	1,004	930	691	1,643	3,284	1,214	1,458	1,233	624	1,766	1,816
Upper Kalskag	2,469	294	2,432	329	391	1,599	1,930	1,534	1,038	642	1,055	1,349	1,266
Aniak	3,722	4,108	2,830	2,602	2,515	2,391	5,667	2,880	4,695	1,395	2,422	3,406	3,281
Chuathbaluk	1,451	<b>1,541</b>	593	937	535	686	796	935	805	342	347	713	862
Middle Kuskokwim	12,345	7,940	6,859	4,798	4,132	6,319	11,677	6,563	7,996	3,612	4,448	7,233	7,224
Crooked Creek	1,513	<b>813</b>	352	519	539	862	610	<b>1,803</b>	391	383	831	810	779
Red Devil	41	186	188	244	122	434	516	981	284	48	129	453	304
Sleetmute	1,475	818	373	367	524	689	1,004	542	633	337	268	641	676
Stony River	<b>790</b>	<b>540</b>	1,247	771	338	516	<b>491</b>	<b>27</b>	<b>89</b>	44	14	233	485
Lime Village <sup>a</sup>	<b>316</b>	<b>419</b>	<b>297</b>	<b>405</b>	<b>314</b>	<b>499</b>	419	909	295	–	232	531	430
McGrath	999	464	676	825	944	476	885	598	642	7	150	522	652
Takotna	0	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	0	<b>0</b>	<b>12</b>	<b>0</b>	<b>0</b>	5	2	1
Nikolai	308	223	54	292	440	349	1,044	513	1,356	2,000	205	1,052	658
Telida <sup>a</sup>	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	5,442	3,464	3,187	3,423	3,221	3,825	4,970	5,386	3,690	2,819	1,834	4,138	3,943
Kuskokwim River <sup>b</sup>	89,674	73,560	63,789	44,324	45,089	54,316	79,631	53,627	68,398	40,872	44,881	59,369	61,328

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Community	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2011–2015	Average 2006–2015
Quinhagak	2,754	2,249	1,794	1,557	1,347	1,255	2,001	1,958	1,959	691	848	1,573	1,757
Goodnews Bay	555	395	586	138	324	349	322	153	268	197	219	258	329
Platinum	108	77	106	28	37	70	76	90	62	16	78	63	67
South Kuskokwim Bay	3,417	2,720	2,486	1,723	1,708	1,674	2,399	2,201	2,289	904	1,145	1,893	2,152
Total estimated harvest	93,091	76,281	66,275	46,047	46,797	55,990	82,030	55,828	70,687	41,776	46,026	61,262	63,480

*Note:* Dashes indicate harvest was not estimated. Bold indicates Bayesian estimates.

<sup>a</sup> Villages not surveyed in 2015. Harvest was not estimated due to lack of recent data.

<sup>b</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Appendix A3.—Estimated number of sockeye salmon harvested for subsistence in the Kuskokwim area, 2006–2016.

Community	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2011–2015	Average 2006–2015
Kongiganak <sup>a</sup>	1,464	<b>960</b>	1,502	1,018	1,869	1,266	<b>1,307</b>	<b>1,031</b>	<b>1,230</b>	–	–	1,208	1,294
N. Kuskokwim Bay	1,464	960	1,502	1,018	1,869	1,266	1,307	1,031	1,230	0	0	967	1,165
Tuntutuliak	1,834	1,763	<b>2,120</b>	932	2,068	1,274	1,516	1,183	<b>1,774</b>	1,999	1,707	1,549	1,646
Eek	<b>684</b>	<b>558</b>	<b>834</b>	1,019	1,241	664	1,490	1,319	1,450	1,111	888	1,207	1,037
Kasigliuk	<b>2,248</b>	<b>1,786</b>	<b>1,041</b>	1,215	1,441	1,269	1,451	1,470	1,990	1,442	1,543	1,524	1,535
Nunapitchuk	1,871	2,147	<b>2,549</b>	1,538	1,902	2,223	2,396	1,806	2,059	2,851	2,508	2,267	2,134
Atmautluak	<b>1,012</b>	1,041	<b>1,250</b>	624	731	827	1,623	1,316	1,531	1,173	1,562	1,294	1,113
Napakiak	1,845	1,962	1,244	917	1,183	1,351	1,141	1,105	1,573	1,179	2,132	1,270	1,350
Napaskiak	1,784	1,738	2,620	1,579	1,979	1,587	2,065	2,069	2,514	2,022	2,086	2,051	1,996
Oscarville	778	712	677	332	250	228	323	347	679	282	329	372	461
Bethel	12,816	13,902	15,247	11,272	11,103	16,946	18,282	12,616	14,828	11,951	16,730	14,925	13,896
Kwethluk	2,770	3,536	4,920	2,432	2,534	2,357	2,884	2,705	5,921	1,955	2,464	3,164	3,201
Akiachak	2,661	3,269	4,354	2,407	2,433	2,647	3,443	2,594	3,047	2,551	2,726	2,856	2,941
Akiak	2,000	3,695	2,881	1,290	1,161	2,576	<b>1,818</b>	1,731	2,418	1,855	3,772	2,080	2,142
Tuluksak	2,247	<b>1,845</b>	2,133	1,691	2,483	1,699	1,380	1,541	622	1,037	1,249	1,256	1,668
Lower Kuskokwim	34,550	37,955	41,869	27,248	30,509	35,648	39,812	31,802	40,406	31,408	39,696	35,815	35,121
Lower Kalskag	1,434	780	1,583	1,044	507	802	891	977	1,040	487	284	839	955
Upper Kalskag	563	417	1,000	369	460	938	770	662	839	718	1,176	785	674
Aniak	692	1,261	1,585	923	1,165	1,168	1,375	1,466	1,578	2,407	8,380	1,599	1,362
Chuathbaluk	508	<b>484</b>	363	564	403	300	297	480	481	382	210	388	426
Middle Kuskokwim	3,197	2,942	4,531	2,900	2,535	3,208	3,333	3,585	3,938	3,994	10,050	3,612	3,416
Crooked Creek	544	<b>523</b>	220	329	302	243	234	<b>514</b>	391	303	264	337	360
Red Devil	510	318	359	477	475	502	511	270	151	88	238	304	366
Sleetmute	1,181	1,303	1,164	684	1,024	693	715	362	541	497	458	562	816
Stony River	<b>746</b>	<b>1,019</b>	1,476	977	372	303	<b>469</b>	447	137	91	95	289	604
Lime Village <sup>a</sup>	<b>1,216</b>	<b>1,406</b>	<b>659</b>	<b>1,080</b>	<b>932</b>	<b>739</b>	780	<b>831</b>	<b>888</b>	–	541	809	948
McGrath <sup>b</sup>	149	375	417	965	650	630	233	538	451	0	199	370	441
Takotna	0	<b>1</b>	<b>3</b>	<b>3</b>	<b>2</b>	0	<b>2</b>	<b>2</b>	<b>3</b>	0	5	1	2
Nikolai	20	14	13	66	65	13	0	0	236	400	34	130	83
Telida <sup>a</sup>	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	4,365	4,960	4,310	4,581	3,822	3,123	2,945	2,964	2,798	1,379	1,834	2,642	3,525
Kuskokwim River <sup>b</sup>	43,577	46,817	52,213	35,747	38,735	43,245	47,396	39,382	48,372	36,781	51,580	43,035	43,226

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Appendix A3.–Page 2 of 2.

Community	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2011–2015	Average 2006–2015
Quinhagak	3,128	1,755	2,097	1,960	1,719	1,582	2,015	2,158	2,939	1,065	1,691	1,952	2,042
Goodnews Bay	995	<b>920</b>	1,739	902	1,093	1,328	1,197	1,113	1,370	797	975	1,161	1,145
Platinum	63	<b>121</b>	156	186	175	135	173	181	349	148	381	197	169
South Kuskokwim Bay	4,186	2,796	3,992	3,048	2,987	3,045	3,385	3,452	4,658	2,010	3,047	3,310	3,356
Total estimated harvest	47,763	49,613	56,205	38,795	41,722	46,290	50,781	42,834	53,030	38,791	54,627	46,345	46,582

*Note:* Dashes indicate harvest was not estimated. Bold indicates Bayesian estimates.

<sup>a</sup> Villages not surveyed in 2015. Harvest was not estimated due to lack of recent data.

<sup>b</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Appendix A4.–Estimated number of sockeye salmon harvested for subsistence in the Kuskokwim area, 2006–2016.

Community	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2011–2015	Average 2006–2015
Kongiganak <sup>a</sup>	657	883	<b>557</b>	561	483	613	<b>356</b>	<b>412</b>	<b>561</b>	–	–	485	565
N. Kuskokwim Bay	657	883	557	561	483	613	356	412	561	0	0	388	508
Tuntutuliak	948	703	1,620	<b>359</b>	698	250	565	450	<b>794</b>	362	456	484	675
Eek	773	<b>459</b>	<b>661</b>	<b>176</b>	315	280	612	483	555	629	410	512	494
Kasigluk	<b>3,070</b>	<b>1,753</b>	<b>867</b>	<b>629</b>	1,043	430	303	418	851	446	394	490	981
Nunapitchuk	692	1,752	508	<b>286</b>	195	407	319	226	1,305	1,154	492	682	684
Atmautluak	254	<b>424</b>	262	<b>67</b>	36	263	383	203	176	311	81	267	238
Napakiak	2,363	1,244	1,006	420	877	927	402	634	740	1,117	506	764	973
Napaskiak	1,640	639	903	786	1,029	471	269	772	1,153	1,353	726	804	902
Oscarville	175	180	62	67	12	43	38	37	128	25	134	54	77
Bethel	18,810	12,972	15,839	12,895	20,426	18,141	13,280	12,662	19,364	12,277	16,801	15,145	15,667
Kwethluk	1,245	1,624	7,262	4,333	1,495	1,097	1,013	1,555	4,422	1,677	682	1,953	2,572
Akiachak	1,714	2,355	4,311	1,790	1,181	1,440	714	1,106	1,845	1,924	2,007	1,406	1,838
Akiak	379	1,325	1,358	661	475	505	<b>455</b>	454	1,501	1,423	2,403	868	854
Tuluksak	498	1,131	<b>635</b>	857	330	163	341	473	808	623	482	482	586
Lower Kuskokwim	32,561	26,561	35,293	23,326	28,112	24,417	18,694	19,473	33,642	23,321	25,574	23,909	26,540
Lower Kalskag	1,415	515	76	318	96	684	1,107	529	907	419	228	729	607
Upper Kalskag	1,799	381	2,350	181	92	998	360	636	938	384	722	663	812
Aniak	1,018	3,003	2,883	2,223	2,533	2,215	3,365	3,102	9,566	7,705	7,530	5,191	3,761
Chuathbaluk	727	419	<b>525</b>	96	76	109	179	319	291	166	149	213	291
Middle Kuskokwim	4,959	4,318	5,834	2,818	2,797	4,006	5,011	4,586	11,702	8,674	8,629	6,796	5,470
Crooked Creek	401	289	<b>952</b>	283	87	297	149	<b>255</b>	198	275	298	235	319
Red Devil	171	193	307	126	88	130	238	318	792	214	166	338	258
Sleetmute	671	360	228	403	458	426	784	219	993	752	524	635	529
Stony River	<b>322</b>	<b>336</b>	<b>552</b>	634	201	333	<b>358</b>	120	177	77	29	213	311
Lime Village <sup>a</sup>	<b>132</b>	<b>443</b>	<b>695</b>	<b>210</b>	<b>146</b>	<b>596</b>	117	<b>384</b>	<b>226</b>	–	123	331	328
McGrath	<b>894</b>	279	247	1,175	1,053	1,331	2,257	523	1,189	173	769	1,095	912
Takotna	<b>0</b>	8	<b>6</b>	<b>28</b>	<b>20</b>	3	<b>22</b>	<b>0</b>	<b>0</b>	53	90	16	14
Nikolai	407	95	53	203	135	20	214	119	256	400	614	202	190
Telida <sup>a</sup>	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	2,998	2,005	3,040	3,062	2,188	3,136	4,139	1,938	3,831	1,944	2,613	2,998	2,828
Kuskokwim River <sup>b</sup>	41,175	33,766	44,724	29,767	33,580	32,172	28,200	26,409	49,736	33,939	36,816	34,091	35,347

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Appendix A4.–Page 2 of 2.

Community	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average 2011–2015	Average 2006–2015
Quinhagak	1,315	1,550	1,869	1,824	1,599	1,369	1,380	1,087	2,240	2,238	2,014	1,663	1,647
Goodnews Bay	605	<b>468</b>	769	261	319	259	382	295	371	552	378	372	428
Platinum	116	<b>106</b>	114	81	197	143	124	50	240	87	180	129	126
South Kuskokwim Bay	2,036	2,124	2,752	2,166	2,115	1,771	1,886	1,432	2,851	2,877	2,572	2,163	2201
Total estimated harvest	43,211	35,890	47,476	31,933	35,695	33,943	30,086	27,841	52,587	36,816	39,388	36,255	37,548

*Note:* Dashes indicate harvest was not estimated. Bold indicates Bayesian estimates.

<sup>a</sup> Villages not surveyed in 2015. Harvest was not estimated due to lack of recent data.

<sup>b</sup> Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.





## **APPENDIX B: SURVEY INSTRUMENT**

Appendix B1.-Kuskokwim Area postseason subsistence salmon harvest survey form, 2016.

Date of Survey: \_\_\_\_\_ Time: \_\_\_\_\_ HHID # \_\_\_\_\_ COMMUNITY: \_\_\_\_\_ Data Entry: \_\_\_\_\_ Error Check: \_\_\_\_\_

Person Interviewed: \_\_\_\_\_

Relation to HH: \_\_\_\_\_ Interviewer: \_\_\_\_\_

**CONFIDENTIAL INFORMATION**  
**2015 Kuskokwim Area Postseason Subsistence Salmon Survey**

1. Head of Household: \_\_\_\_\_ Telephone \_\_\_\_\_ Address: \_\_\_\_\_

2. How many people live in your household? \_\_\_\_\_ Permanent Notes: \_\_\_\_\_

3. Did anyone in your household subsistence or commercial fish for salmon? YES  NO   
 (Subsistence "harvest" includes catching or cutting salmon.) YES → Part I, NO → Part II.  Adult household member declined to be interviewed.  
 Reason: \_\_\_\_\_

**PART I: FISHING HOUSEHOLDS**

4. Do you have a catch calendar to turn in: YES  NO  Already Sent In  (Is calendar group or household harvest? Are all salmon recorded on calendar?)

5. Did you fish in a group or did you fish by yourself? Total households (including respondent): \_\_\_\_\_ Names: \_\_\_\_\_

6. How many salmon did your fishing group harvest this year? Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_

7. How many salmon did your household harvest/keep from the group harvest? Where did you go fishing? (See Map; **Not including Permit caught fish**)

Area	Chinook	Sockeye	Chum	Coho	Pink
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Area	Chinook	Sockeye	Chum	Coho	Pink
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

8. What is your household's main gear type? (1=primary, 2=secondary, etc.) Set Net \_\_\_\_\_ Drift Net \_\_\_\_\_ Fish Wheel \_\_\_\_\_ Hook & Line \_\_\_\_\_ Dipnet \_\_\_\_\_ Other \_\_\_\_\_

a. Hook & Line? YES  NO  ; a1. Included above (#7)? YES  NO  Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_

b. other gear \_\_\_\_\_ b1. Included above (#7)? YES  NO  Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_

c. other gear \_\_\_\_\_ c1. Included above (#7)? YES  NO  Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_

d. Whitefish Net?  d1. Included above (#7)? YES  NO  Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_

9. Did anyone in your household commercial fish? YES  NO

a. If yes, did your household keep any of the commercial salmon for subsistence? Area \_\_\_\_\_ Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_

b. Are these fish already reported in the household harvest (#7)? YES  NO

10. Did anyone in your household lose any salmon (i.e. bears, weather, flies, etc.)? YES  NO

Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_ Reason(s) for loss: \_\_\_\_\_

a. Are the "lost" fish already reported in the household harvest (#7)? YES  NO

b. Were any of the "lost" salmon fed to your dogs (whole fish only)? YES  NO  ; How many? Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_

c. Were extra fish harvested to replace those that were lost? YES  NO  ; How many? Area \_\_\_\_\_ Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_

d. Are the "replacement" fish already reported in the household harvest (#7)? YES  NO

11. Did your household give away any salmon that you harvested (not including spoiled)? YES  NO  (shared outside of their fishing group)

Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_ ; Names: \_\_\_\_\_

a. Are these fish already reported in the household harvest (#7)? YES  NO

**PART II: ALL HOUSEHOLDS**

12. Did anyone give you salmon? YES  NO  Code: S = Subsistence; C = Commercial; T = Test Fish; P=Permit (community permits)

Code: P Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_ Names: \_\_\_\_\_  
 Code: \_\_\_\_\_ Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_ Names: \_\_\_\_\_  
 Code: \_\_\_\_\_ Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_ Names: \_\_\_\_\_  
 Code: \_\_\_\_\_ Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_ Names: \_\_\_\_\_

a. Were any of the fish you received fed to your dogs (from question #12)? YES  NO  Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_

13. How many salmon does your household like to have for subsistence?

Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_  
 Why? \_\_\_\_\_ Why? \_\_\_\_\_ Why? \_\_\_\_\_ Why? \_\_\_\_\_ Why? \_\_\_\_\_

14. Did your household catch any other fish besides salmon? (From last Sept/October to now.) YES  NO

Humpback Whitefish \_\_\_\_\_ Broad Whitefish \_\_\_\_\_ Cisco \_\_\_\_\_ Sheefish \_\_\_\_\_ Lush \_\_\_\_\_ Pike \_\_\_\_\_ Blackfish \_\_\_\_\_  
 Grayling \_\_\_\_\_ Char \_\_\_\_\_ Rainbow Trout \_\_\_\_\_ Smelt \_\_\_\_\_ Herring \_\_\_\_\_

15. How many dogs does your household have? \_\_\_\_\_ (if zero go to question #18)

16. Do you feed whole salmon to your dogs? YES  NO  Only Scraps

17. Not including spoiled fish or fish you received, how many whole salmon did your household put up for dogs this year? (Numbers should represent whole fish, not scraps)

Chinook \_\_\_\_\_ Sockeye \_\_\_\_\_ Chum \_\_\_\_\_ Coho \_\_\_\_\_ Pink \_\_\_\_\_  
 a. Are fish harvested for dogs already reported in the household harvest (from question #7)? YES  NO

18. Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Surveyor Comments: \_\_\_\_\_  
 \_\_\_\_\_

Completed Survey  Partial Survey  No Survey  Survey Reviewed for completeness by Surveyor



## **APPENDIX C: FISH MEASURES**

Appendix C1.–Approximate measures used to convert reported amounts of fish harvest, Kuskokwim Area, 2008–2016.

Amount	Description
<b>Salmon</b>	
1 Chinook salmon = 5–8 pound strips	Dried and smoked Chinook salmon
1 gallon Ziplock = 5pound strips	Dried and smoked Chinook salmon
1 quart Ziplock = 2 pound strips	Dried and smoked Chinook salmon
6 gallon bucket = 4 to 5 Chinook salmon	Dried Chinook salmon
5 gallon poke fish = 25 to 30 chum salmon	Dried chum salmon in seal oil
30 gallon barrel = 150 to 180 chum salmon	Dried chum salmon in seal oil
1 gallon Ziplock = 2 to 3 chum salmon	Dried chum salmon filets
5 gallon bucket = 25 chum salmon	Chum salmon filets, tightly packed
1 dried chum salmon = 2/3 pound	Summer chum salmon for dog food
1 bundle – 50 dried chum salmon	Summer chum salmon for dog food
300 dog salmon/dog/winter	Feeding summer chum salmon to a dog team
1 dried chum salmon = 1.25 to 1.33 pounds	Summer or fall chum salmon
1 pink salmon = 3 pounds	Pink salmon
<b>Other fish</b>	
1 small whitefish = 1 pound	Round whitefish, least, Bering, or arctic cisco, caught in whitefish net (4 inch or smaller mesh) or a fish wheel
1 large whitefish = 4 pounds	Broad or humpback whitefish caught in a chum salmon net (5 inch or larger mesh) or a fish wheel
125 smelt = 5-gallon bucket	
1 gunny sack = 50 to 100 pounds (ask fishermen)	tomcod, whitefish, herring
14 blackfish = 1 pound	Blackfish
350 blackfish = 5-gallon bucket = 25 pounds	
1 eel = 1/3 pound	Arctic lamprey