Fishery Data Series No. 16-55

Subsistence Salmon Harvests in the Kuskokwim Area, 2015

Annual Report for Study 14-352

USFWS Office of Subsistence Management

Fisheries Resource Monitoring Program

by

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December 2016

Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat or long
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$log_{2,}$ etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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December 2016

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This document should be cited as follows:
Shelden, C. A., T. Hamazaki, M. Horne-Brine, and G. Roczicka. 2016. Subsistence salmon harvests in the Kuskokwim area, 2015. Alaska Department of Fish and Game, Fishery Data Series No. 16-55, Anchorage.

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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 2015. 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 2015, Kuskokwim Area subsistence users were subject to heavy restrictions with respect to the harvest of Chinook salmon. The United States Fish and Wildlife Service, through special action, created a subsistence harvest permit system at the community level to allow some harvest for federally qualified users while restrictions were in place. Households were surveyed in 27 communities in the Kuskokwim Management Area, including most communities along the Kuskokwim River and all communities within south Kuskokwim Bay. Subsistence salmon harvest estimates for 2015 were 19,437 Chinook *Oncorhynchus tshawytscha*, 43,516 chum *O. keta*, 39,429 sockeye *O. nerka*, 36,816 coho *O. kisutch*, and 1,233 pink salmon *O. gorbuscha*.

Key words: Chinook *Oncorhynchus tshawytscha*, chum *Oncorhynchus keta*, coho *Oncorhynchus kisutch*, and pink *Oncorhynchus gorbuscha* salmon, 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 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 Kuskokwim Area. This report describes the outcome of surveys for the 2015 fishing season in the Kuskokwim Area.

The Kuskokwim Management Area (Figure 1) subsistence salmon fishery is one of the largest in the state 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 use surveys in 23 Kuskokwim Area communities. The results indicate 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 for harvesting salmon include drift gillnets, set gillnets, and rod and reel (Hensel 1996), as well as dipnets, which were recently reintroduced.

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 Kuskokwim Area households revolve around subsistence fishing.

Thirty-eight communities have traditionally been recognized in the Kuskokwim Area. Twenty-nine villages have typically been targeted for annual surveys, based on logistics and voluntary involvement in the study (Table 1; Figure 1). On average from 2005 to 2014, 77% 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 up through Chuathbaluk harvested an average of 9% of the total subsistence salmon between 2005 and 2014. The Upper Kuskokwim River communities harvested about 6% of the total, South Kuskokwim Bay communities harvested 5% of the total, and North Kuskokwim Bay communities harvested an average of 3% of the total, between 2005 and 2014 (Appendices A1–A4). This harvest distribution is similar to the human population distribution along the Kuskokwim River. In 2014, the population percentages calculated were Lower (78%), Middle (8%), and Upper (4%) Kuskokwim River communities; South Kuskokwim Bay communities (7%); and Kongiganak on north Kuskokwim Bay (3%) (Shelden et al. 2016).

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 been reported to travel 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 communities of Quinhagak, Goodnews Bay, and Platinum, located in South Kuskokwim Bay, 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 chosen to participate in the ADF&G Monitoring Program for 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 as well as rivers close to the communities (Simon et al. 2007; Wolfe et al. 2012).

At the time of this study, ADF&G had not required subsistence fishermen in the Kuskokwim Area to report their harvest to ADF&G, and licenses and permits had not been required for a fisherman to participate in the subsistence fishery. Prior to 2014, with exceptions for special management areas (e.g., Aniak River), subsistence fishing in the Kuskokwim Management Area was largely free of subsistence harvest limits. In 2014, the Federal Subsistence Management Program closed federal waters of the Yukon Delta Wildlife Refuge (Refuge) to the harvest of Chinook salmon except by federally qualified subsistence users in possession of a Federal Social and Cultural Permit. Permits were intended to allow village-designated fishermen to harvest a predetermined number of Chinook salmon for each village in recognition of the cultural significance of this species to the people of that area. Harvested salmon were intended to be shared throughout the community and were not intended to fully provide for subsistence needs, because Chinook salmon resources were considered inadequate for sustainable harvest on that scale. In 2015, responding to requests from communities, the Federal Subsistence Management Program closed Refuge waters to the harvest of Chinook salmon except by federally qualified subsistence users in possession of a Federal Community Harvest Permit. The drainagewide harvest quota was determined to be 7,000 Chinook salmon. Specific community allocations were

based on each community's share of the average total subsistence harvest of Kuskokwim River Chinook salmon over 20 years (1990–2009).

Under state regulation, legal subsistence fishing gear includes gillnet (the most common gear type), beach seine, rod and reel, fish wheel, and spear (5 AAC 01.270). In 2014, the Alaska Board of Fisheries (BOF) approved the use of dipnets in the Kuskokwim River in times of 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 the Kuskokwim Area rivers to meet escapement and subsistence needs. Since 1960 the 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, 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 to 109,800 Chinook salmon; 41,200 to 116,400 chum salmon; 32,200 to 58,700 sockeye salmon; 27,400 to 57,600 coho salmon; and 500 to 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 Kuskokwim Area in 2013. 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 Kuskokwim Area communities, located along the Bering Sea coast, ANS ranges 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 Kuskokwim area, 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 (Lipka et al. 2016).

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 Kuskokwim Area.
2. Document gear types used by Kuskokwim Area subsistence fishermen.

3. Estimate fishing households, community population size, and households receiving salmon.
4. Document the number of dogs within Kuskokwim Area communities and salmon fed to dogs.
5. Document household responses relating to meeting of subsistence salmon needs in surveyed communities.
6. Document reported harvest of non-salmon fish species among fishermen in the Kuskokwim Area.

METHODS

STUDY DESIGN

In 2015, household surveys were attempted in 27 of the 38 communities within the Kuskokwim Management Area, including most communities along the Kuskokwim River and all communities within South Kuskokwim Bay. The village of Kongiganak in the north Kuskokwim Bay declined a request by ADF&G staff to conduct surveys in 2012–2015. Lime Village was not attempted for logistical reasons and the village of Telida appears to be a seasonally occupied location with no year-round residents. With the exception of 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 persons 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;
- Unknown: a household that has no harvest record within any of the past 5 years.

For this study, 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:

- High harvester: 100%;
- Medium harvester: 100%;
- Light harvester: 30%;
- Usually do not fish: 30%;
- Unknown: 100%.

When the number of households in each stratum was less than 5, 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 Bethel, a simple random survey was conducted where each dwelling (physical location instead of household) was the primary sampling unit. Because Bethel is a main hub city of western Alaska, its population is highly fluid, and a high proportion of the population moves in and out of Bethel on a regular basis (Krauthoefer 2005). 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, occupied dwellings were randomly selected for survey. Households randomly selected for survey in Bethel were pursued using rigorous protocols to prevent bias. 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. 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. The final number of surveyed households was close to 20% of the total number of occupied dwellings.

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.

Before conducting interviews, all surveyors, ADF&G and ONC, were trained in surveying techniques, including direction on 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. Surveyors were also briefed on fishery issues and 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 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. Occasionally, interviews were conducted with households not pre-selected for the survey. Those households either 1) were 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 Kuskokwim Area. 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 was largely the same as the 2014 instrument. However, an adjustment was made to Question 12 to allow surveyors to record more detail. Space for this question was increased to capture and differentiate fish received from community permit fishing from other fish harvested or received. This was more to prevent an accidental over counting of harvest due to confusion about how the fish were obtained. Other than attempts to clarify permit caught fish numbers, the survey was conducted the same as in 2014 (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, Appendix B1). 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, Appendix B1).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.

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 as follows:

- Respondents were asked the *number* of fish, by species, the household would usually like to have or receive to meet their subsistence needs (Question 13, Appendix B1).
- For those who did not fish, respondents were asked the number of fish, by species; the household usually received or expected to receive at the beginning of the season to meet their subsistence needs.
- For fishing households, the number actually harvested was divided by normal household harvest of fish for fishing households (Question 7).

- For households receiving fish, the number actually received was divided by that usually received (Question 12).
- Results were binned by percentages of harvest goals met: 25%, 50%, 75%, and 100%.

Responses were divided into 2 categories:

1) Households that participated in harvesting salmon; and
2) Households that did not participate in harvesting salmon.

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 discrepancies. Occasionally, fishing group members simply did not agree on numbers for salmon harvest. In this event, ADF&G project staff made a judgment on 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 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. Calendar mailings were based on the most up-to-date household lists used in the harvest Monitoring Program. Extra calendars were kept at the Bethel ADF&G office for distribution as needed or upon request.

The calendar has been helpful for examination of subsistence harvest timing and assists fishermen in keeping track of their daily salmon harvest for reference during postseason surveys. 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. Calendars provide harvest timing data, which is important for making fishery management decisions.

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 (see section: *Harvest estimation of non-surveyed and under-surveyed communities*).

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 response of surveyed household (i) (i = 1 … 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:

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

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

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

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

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

The 95% confidence interval of total community harvest (95% CI_k) was calculated as:

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

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

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

The 95% confidence interval of total community harvest when a single stratum was not surveyed (95% CI_k) was calculated as:

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

The above methods were used for estimation of salmon harvests (Question 7) and the number of people (Question 2). For the number of fish needed/usually harvested (Question 13), only harvests of those who subsistence fished were used.

For estimation of 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_k) was calculated as:

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

Harvest Estimation of Non-surveyed and Under-surveyed Communities

Harvests of several communities were not estimated in 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:

1. Events that cause missing harvest data follow a missing at random process (MAR); and
2. 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 applies only for 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 Kuskokwim Management Area, 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 the K communities within a given geographic subarea, we let $D_{kl.obs}$ denote the observed data (average harvest per household) for community (k = 1,…, K) in year (l). In application, the average household harvest $D_{kl.obs}$ was the log-transformed average household harvest, $D_{kl.obs} = \log(T_{kl}/N_{kl}+1)$, where T_{kl} was the total community harvest and N_{kl} was the total number of households in community (k) during year (l).

We assumed that the $D_{kl.obs}$ arose from an underlying multivariate normal distribution in which $\boldsymbol{\mu}_K$ is a vector of mean annual household harvest in the communities (K) within the subarea and $\boldsymbol{\Sigma}$ is a K x K covariance matrix:

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

In the Bayesian hierarchical model, we further assumed that $\boldsymbol{\mu}_K$ and $\boldsymbol{\Sigma}$ themselves arose from some other, unknown distribution. We assigned a normal prior distribution for $\boldsymbol{\mu}_K$, with mean μ and variance σ^2, and a Wishhart distribution with K x K dimensions for $\boldsymbol{\Sigma}$:

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

Then, the posterior distributions for $\boldsymbol{\mu}_K$ and $\boldsymbol{\Sigma}$ were derived as:

$$\tilde{\boldsymbol{\mu}}_K, \tilde{\boldsymbol{\Sigma}} \sim P(\boldsymbol{\mu}_K, \boldsymbol{\Sigma} \mid D_{kl.obs}) \quad . \tag{12}$$

A predicted value for missing data, $D_{kl.mis}$, was derived from random draws from the posterior distribution for $\boldsymbol{\mu}_K$ and $\boldsymbol{\Sigma}$:

$$\tilde{D}_{kl.mis} \sim P(D_{kl.mis} \mid D_{kl.obs}, \tilde{\boldsymbol{\mu}}_K, \tilde{\boldsymbol{\Sigma}}) \quad . \tag{13}$$

For the Bayesian estimation, WinBUGS 1.4.3 (Lunn et al. 2000) was used, 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:

$$\tilde{T}_{kl} = N_{kl} \exp(\tilde{D}_{kl.mis}), \tag{14}$$

and its 95% confidence interval was estimated as:

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

where $V(\tilde{D}_{kl}^{mis})$ 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):

$$\hat{T} = \sum_{k=1} \hat{T}_k, \tag{16}$$

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

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

RESULTS

HOUSEHOLD SELECTION AND SURVEY

In 2015, project surveyors visited and successfully surveyed 27 of 29 targeted communities (Table 2; Appendices A1–A4). Within the 29 targeted communities, a total of 2,153 households were selected for survey. Of these 1,574 were contacted along with 204 previously unknown households. Together these 1,778 households, minus 163 refusals (1,615 surveys), represent a survey of 38% of Kuskokwim Area households. Of those selected households that could not be contacted, 47 reside in 2 villages that could not be surveyed in 2015. The Kongiganak tribal council denied ADF&G permission to visit for the fourth consecutive season, and reasons were not made clear. Lime Village was not visited because of a combination of factors including its remoteness and difficulty coordinating village staff.

ADF&G surveyors visited 26 Kuskokwim Area villages. They contacted 1,326 households including both preselected and previously unknown households (80% of preselected and 204 additional households). ADF&G surveyors conducted 1,227 surveys 99 refusals (Table 2).

ONC surveyors contacted 22% of Bethel dwellings while adhering to a strict random selection and sampling protocol (Table 2). In all, 748 households (36%) were selected, and 452 households (60% of those selected) were contacted. Three hundred and eighty-eight households (52%) were successfully surveyed and 64 households declined to be surveyed (Table 2).

PERMIT REPORTS

In 2015, the USF&WS OSM provided a final tally of all permit caught Chinook, chum, and sockeye salmon by community (Table 3). OSM reported that a total of 4,582 Chinook, 1,740 chum, and 638 sockeye salmon were harvested using community permits in 2015. These have been added directly into community harvest estimates (Table 4; Appendices A1–A4).

HARVEST ESTIMATES

The total combined estimated harvest by species for the Kuskokwim Area (in communities for which estimates could be made) was 19,437 (95% CI +/-1,587) Chinook, 43,516 (95% CI +/-3,946) chum; 39,429 (95% CI +/-3,758) sockeye; 36,816 (95% CI +/-5,954) coho; and 1,233 (95% CI +/-360) pink salmon (Table 4). Overall, approximately 140,431 salmon were harvested in 2015 for subsistence use (Table 4).

For 2015, survey results were stratified and expanded for each community (Appendices D1–D5). The salmon harvests for Kongiganak and Lime Village (not surveyed in 2015) would normally have been estimated using Bayesian methods as described above. However, these villages have not been successfully visited often or consistently enough in recent years to provide a useful estimate via this method and were therefore not estimated in 2015 (Appendices A1–A4).

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 5). In 2015, in the interest of conserving Chinook salmon, commercial fish buyers in the area chose not to purchase Chinook salmon in order to encourage retention for subsistence use and to discourage targeting of Chinook salmon by commercial fishermen. In 2015, an estimated 227 coho, 181 Chinook, 112 sockeye, 62 chum, and 26 pink salmon were retained (Table 5).

PRIMARY FISHING GEAR

In 2015, out of 866 responses, 595 (69%) reported that drift gillnet as the primary gear type used for subsistence salmon fishing (Table 6). The next most prevalent gear type was set gillnet (152, or 18%) followed by Hook and line (115, or 13%). Gear type estimates were not expanded (Table 6).

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

We estimated that 1,952 households participated in the subsistence fishery for salmon in 2015 (Table 7). This includes all households reporting harvest regardless of predetermined strata. The total estimate of individual people living in surveyed communities of the Kuskokwim Area in 2015, including fishing and non-fishing residents, was 15,333 (Table 8). The average number of people per household was ~4 individuals.

In 2015, based on answers provided by 37% of households in the Kuskokwim Area, an estimated 1,605 (95% CI +/-306) Chinook, or 8% of the total subsistence Chinook salmon harvest from the area, were shared by subsistence fishermen with other community members (Table 9). Similarly, 2,761 (95% CI +/-547), or 6% of the total subsistence chum harvest; 4,201 (95% CI +/-753), or 11% of the total subsistence sockeye harvest; 5,753 (95% CI +/-1,015), or 16% of the total subsistence coho salmon harvest; and 493 (95% CI +/-780), or 40% of the total subsistence pink

salmon harvest, were shared by subsistence fishermen with other community members (Tables 4 and 9). In 2015, very few fish were reported as being shared between commercial fishers and other area residents (6 Chinook salmon, 95% CI +/-6; 43 coho salmon, 95% CI = /-28; no chum or sockeye salmon; Table 10).

The Bethel test fishery reported catches of 472 Chinook, 1,487 chum, 1,045 sockeye, and 1,615 coho salmon, most of which were distributed to residents in Bethel, Kwethluk, Napaskiak, Eek, and Red Devil in cooperation with ONC (Lipka et al. 2016). It is unclear exactly how many fish of each species were distributed in each village or whether other villages were involved. The Aniak test fishery reported catches of 360 Chinook, 649 chum, and 146 sockeye salmon, and most of these fish were distributed within the village of Aniak (Dan Gillikan, Biologist, Napaimute Village Council; personal communication).

SUBSISTENCE USE OF SALMON FOR DOG FOOD

In 2015, regarding the question about owning dogs, 980 respondents reported owning a combined total of 2,267 dogs. Households reporting dogs owned an average of 2 dogs per household. Twenty-eight households reported feeding whole salmon to dogs (3% of dog owners), and among these households an average of 5.4 salmon per household were fed to dogs (Table 11).

LOST FISH

In 2015, from a total of 1,597 respondents, 1,899 salmon were reported as lost (i.e., not edible due to spoilage, animals, etc.; Table 12). Out of the 109 households that provided a reason for losing fish, 83% reported weather-related reasons (e.g., rain, moldy, flies, spoiled); 8% reported animals (e.g., bears, birds, otters); 7% reported disease; and 2% reported human theft as having a negative effect (Table 12). Estimates of numbers of lost salmon were not expanded.

SUBSISTENCE SALMON NEEDS

Regarding needs met for Chinook salmon, 15% of respondents reported that they did not have a need for that species (Table 13). Of those reporting a need for this species, an estimated 15% met 100% of their needs, 15% met 50%–75% of their needs, and 70% reported meeting only 25% of their needs (+/-1% for rounding error, Table 14). Of the 1,008 (1,110 less 102 unknowns) respondents who provided a reason for not meeting their needs, 47% indicated this was because of 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. Approximately 4% cited natural conditions including run dynamics (low abundance, timing of the run), river conditions (flooding, clarity, debris load), and inclement weather. Approximately 47% of respondents cited fisheries management decisions as the reason they did not meet their needs. Less than 2% reported intentionally abstaining for conservation reasons (Table 13).

Regarding needs met for chum salmon, 32% of respondents stated that they do not generally fish for this species (Table 15). Of those reporting a need for this species, an estimated 43% met 100% of their needs, 16% met 50%–75% of their needs, and 40% reported meeting only 25% of their needs (+/-1% for rounding error, Table 16). Of the 541 (657 less 116 unknowns) respondents who provided a reason for not meeting their needs for chum salmon, 64% cited non-fishery related reasons similar to those given for Chinook salmon and 5% cited natural

conditions similar to those listed above. Approximately 31% of respondents cited fisheries management decisions as the reason they did not meet their needs (Table 15).

Regarding needs met for sockeye salmon, 20% of respondents stated that they do not generally fish for this species (Table 17). Of those reporting a need for this species, an estimated 37% met 100% of their needs, 18% met 50%–75% of their needs, and 45% reported meeting only 25% of their needs (+/-1% for rounding error, Table 18). Of the 725 (842 less 117 unknowns) respondents that indicated that they had not met their needs for sockeye salmon, 60% cited non-fishery related reasons similar to those given for Chinook salmon and 5% cited natural conditions similar to those listed above. Approximately 35% of respondents cited fisheries management decisions as the reason they did not meet their needs (Table 17).

Regarding needs met for coho salmon, 22% of respondents stated that they do not generally fish for this species (Table 19). Of those reporting a need for this species, an estimated 38% met 100% of their needs, 16% met 50%–75% of their needs, and 47% reported meeting only 25% of their needs (+/-1% for rounding error, Table 20). Of the 676 (797 less 121 unknowns) respondents that indicated that they had not met their needs for coho salmon, 76% cited non-fishery related reasons similar to those given for Chinook salmon and 9% cited natural conditions similar to those listed above. Approximately 15% of respondents cited fisheries management decisions as the reason they did not meet their needs (Table 19).

REPORTED AND ESTIMATED HARVEST OF NON-SALMON SPECIES

In 2015, estimates for the harvest of non-salmon species were expanded similar to salmon. Based on these estimates, the most heavily harvested species in the Kuskokwim appear to be blackfish (*Dallia pectoralis*) and smelt (*Osmerus mordax*). These species were each harvested in numbers that compared to all salmon combined: 209,207 (95% CI +/-37,660) blackfish and 171,702 (95% CI +/-22,527) smelt, versus 140,431 total salmon (all species; Tables 4 and 21). It is important to note that both blackfish and smelt are significantly smaller than salmon and are often measured in “buckets full” rather than individual fish (Appendix C1).

After blackfish, salmon, and smelt; the most heavily harvested species was northern pike (*Esox lucius*). Pike were harvested in numbers comparable to chum salmon, sockeye, and coho salmon (Tables 4 and 22). 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 (Tables 21 and 22).

HARVEST CALENDARS

In 2015, Kuskokwim Area households returned a total of 112 subsistence harvest calendars (approximately 5% of total issued).

DISCUSSION

HARVEST ESTIMATES

The 2015 subsistence harvest of Chinook salmon was estimated to have been the second lowest on record, after 2014 (Figures 2 and 3). All sections of Kuskokwim River reported this trend in 2015 (Figure 3; Appendix A1). South Kuskokwim Bay communities have shown some variation in in Chinook salmon harvest over the last several years (Figure 4). The North Kuskokwim Bay community of Kongiganak has not been visited since 2011, and this lack of recent data prevents accurate estimation using Bayesian methods. No estimate was made for this community in 2015.

In 2015 the total harvest of chum salmon was below the 2010–2014 and averages 2005–2014 (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 2015 (Figure 5). This was apparent in each of the 3 sections of the Kuskokwim River (Figure 6). Overall chum salmon abundances were considered to be below average throughout the area in 2015 (Lipka et al. 2016).

The total harvests of sockeye salmon were below the recent 5- and 10-year averages (Figure 7; Appendix A3). The reported harvest of sockeye salmon from Upper Kuskokwim River communities has been below the 10-year average since 2010 (Figure 8; Appendix A3). Middle Kuskokwim River communities continued to increase their harvest of sockeye salmon in 2015, and Lower River communities harvested numbers similar to those taken in 2013 (Figure 8; Appendix A3).

The total harvest of coho salmon was below the recent 10-year average but similar to the recent 5-year average in the Kuskokwim Area in 2015 (Figure 9; Appendix A4). Coho salmon subsistence harvests in the middle Kuskokwim River villages were second highest on record after 2014, suggesting that a coho salmon harvest was more important among those communities than in other areas in 2015 (Figure 10; Appendix A4).

AMOUNTS NECESSARY FOR SUBSISTENCE

In 2015 the relative success of Kuskokwim River salmon harvests were mixed. Harvest of Chinook salmon fell far below the ANS range (5 AAC 01.286). Despite being lower than recent averages, subsistence harvests of chum, sockeye, coho, and pink salmon in the Kuskokwim River were within the ANS ranges 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 4; Appendices A1–A4). ANS for the North Kuskokwim Bay and Bering Sea coastal communities within the Kuskokwim Area fall under the remainder of the Kuskokwim Area description. In 2015, with none of these communities directly participating in the survey, it was impossible to determine the status of ANS for this subarea.

ACKNOWLEDGEMENTS

Special thanks go to the thousands of households that graciously allowed us into their homes to collect this valuable information and for their continued participation in this project. Thanks to the Fisheries Resources Monitoring Program (FRMP) Division of the U.S. Fish and Wildlife Service (USF&WS) Office of Subsistence Management (OSM), which provided funding for this

cooperative program under the *Kuskokwim Area postseason subsistence harvest survey project* (FRMP 14-352, OSM agreement F14AC01209 NOAL, and ADF&G cooperative agreement 15-038). The authors thank USFWS OSM anthropologist Pippa Kenner for project support and report review.

The authors thank our staff, including our key ADF&G crew leader, Maureen Horne-Brine, who managed logistics at all stages of the project and coordinated with all partners and technical staff and all village administrators to complete this project successfully in 2015. We thank our ADF&G surveyors Cara Lucas, Matthew Lohrstrorfer, Janet Bavilla, and Jayme Walden.

The authors are also grateful to our co-investigators from ONC. ONC project staff includes ONC's Director of Natural Resources Greg Roczicka, and his survey crew Iyana Dull, Garis Kinegak, and Richard Kinegak.

The authors would also like to acknowledge the following ADF&G staff: Christopher Lawn, ADF&G AYK Division of Commercial Fisheries programmer for his training, design, and support with the subsistence salmon survey database; Dave Koster, ADF&G Division of Subsistence, for database management support and advice in improving Bethel survey practices; Jason Graham, cartographer, for creating the project maps; Shannon Royse, Publications Specialist, for reporting support and expertise leading to completion of this report; Jan Conitz, AYK Regional Research Coordinator, for regional and technical review; and Jim Simon and Jim Fall, ADF&G Division of Subsistence, for their review.

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TABLES AND FIGURES

Table 1.–Kuskokwim Area communities by geographic location.

North Kuskokwim Bay	Kipnuk[a]
	Kwigillingok[a]
	Kongiganak[a]
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[b]
	McGrath
	Takotna
	Nikolai
	Telida[c]
South Kuskokwim Bay	Quinhagak
	Goodnews Bay
	Platinum
Bering Sea Coast	Mekoryuk[a]
	Newtok[a]
	Nightmute[a]
	Toksook Bay[a]
	Tununak[a]
	Chefornak[a]

[a] The community was not surveyed in 2015 because residents chose as a group not to participate in the study.

[b] The community was not surveyed in 2015 for logistical reasons.

[c] The community is essentially no longer significant, operating as a season fish camp for a small number of families that spend winters in other locations.

Table 2.–Households selected and surveyed by user group, 2015.

	Unknown					Does Not Usually Fish					Light Harvester					Medium Harvester					High Harvester					Combined use groups							
Community	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	–	–	–	–	–	–	–	–	–	–	73	37	0	–	–	15	15	0	–	–	2	2	0	–	–	90	54	0	–	0.00	0	–	0%
N. Kuskokwim Bay	–	–	–	–	–	–	–	–	–	–	73	37	0	–	0.00	15	15	0	–	0.00	2	2	0	–	0.00	90	54	0	–	0.00	0	–	0%
Tuntutuliak	8	3	3	4	2.33	5	5	3	0	0.60	47	23	22	0	0.96	25	25	24	0	0.96	7	7	7	0	1.00	92	63	59	4	1.00	5	58	63%
Eek	6	0	0	6	–	3	3	2	0	0.67	68	34	27	3	0.88	14	14	12	0	0.86	1	1	1	0	1.00	92	52	42	9	0.98	4	47	51%
Kasigluk	14	5	5	6	2.20	1	1	1	0	1.00	71	35	31	3	0.97	18	18	18	0	1.00	3	3	3	0	1.00	107	62	58	9	1.08	4	63	59%
Nunapitchuk	8	4	2	4	1.50	4	4	4	0	1.00	77	39	34	5	1.00	21	21	19	0	0.90	11	11	10	0	0.91	121	79	69	9	0.99	2	76	63%
Atmautluak	10	4	3	6	2.25	1	1	0	–	–	34	18	13	1	0.78	16	16	16	0	1.00	7	7	7	0	1.00	68	46	39	7	1.00	2	44	65%
Napakiak	15	3	2	9	3.67	3	3	2	0	0.67	62	31	23	2	0.81	17	17	14	0	0.82	2	2	2	0	1.00	99	56	43	11	0.96	6	48	48%
Napaskiak	13	4	1	9	2.50	4	4	3	0	0.75	51	25	22	3	1.00	27	27	22	0	0.81	9	9	9	0	1.00	104	69	57	12	1.00	7	62	60%
Oscarville	1	0	0	1	–	–	–	–	–	–	5	5	5	0	1.00	5	5	3	0	0.60	4	4	4	0	1.00	15	14	12	1	0.93	1	12	80%
Bethel	–	–	–	–	–	–	–	–	–	–	2,076	748	452	–	0.60	–	–	–	–	–	–	–	–	–	–	2,076	748	452	0	0.60	64	388	19%
Kwethluk	27	15	11	11	1.47	6	6	5	0	0.83	98	49	42	4	0.94	33	33	30	0	0.91	9	9	9	0	1.00	173	112	97	15	1.00	13	99	57%
Akiachak	24	12	7	11	1.50	6	6	5	0	0.83	77	39	36	3	1.00	35	35	30	0	0.86	15	15	15	0	1.00	157	107	93	14	1.00	3	104	66%
Akiak	17	9	4	7	1.22	1	1	1	0	1.00	35	17	13	0	0.76	24	24	22	0	0.92	10	10	7	0	0.70	87	61	47	7	0.89	9	45	52%
Tuluksak	19	8	5	9	1.75	5	5	4	0	0.80	46	24	22	3	1.04	17	17	15	0	0.88	8	8	8	0	1.00	95	62	54	12	1.06	3	63	66%
Lower Kuskokwim	162	67	43	83	1.88	39	39	30	0	0.77	2,747	339	290	479	2.27	252	252	225	0	0.89	86	86	82	0	0.95	3,286	1,531	1,122	110	1.57	123	1109	34%
Lower Kalskag	9	5	3	4	1.40	2	2	2	0	1.00	48	24	19	3	0.92	10	10	9	0	0.90	5	5	5	0	1.00	74	46	38	7	0.98	3	42	57%
Upper Kalskag	8	8	5	0	0.63	1	1	0	–	–	42	21	21	2	1.10	4	4	4	0	1.00	7	7	7	0	1.00	62	41	37	2	0.95	3	36	58%
Aniak	–	–	–	–	–	–	–	–	–	–	180	88	70	31	1.15	–	–	–	–	–	–	–	–	–	–	180	88	70	31	1.15	9	92	51%
Chuathbaluk	2	1	1	1	2.00	2	2	1	0	0.50	19	19	17	0	0.89	3	3	3	0	1.00	3	3	3	0	1.00	29	28	25	1	0.93	1	25	86%
Middle Kuskokwim	19	14	9	5	1.00	5	5	3	0	0.60	289	152	127	36	1.07	17	17	16	0	0.94	15	15	15	0	1.00	345	203	170	41	1.04	16	195	57%
Crooked Creek	5	3	1	1	0.67	–	–	–	–	–	20	20	19	0	0.95	6	6	6	0	1.00	–	–	–	–	–	31	29	26	1	0.93	3	24	77%
Red Devil	–	–	–	–	–	–	–	–	–	–	5	5	2	0	0.40	2	2	1	0	0.50	2	2	1	0	0.50	9	9	4	0	0.44	0	4	44%
Sleetmute	5	4	4	1	1.25	2	2	2	0	1.00	25	25	19	0	0.76	2	2	2	0	1.00	2	2	1	0	0.50	36	35	28	1	0.83	6	23	64%
Stony River	3	2	2	0	1.00	–	–	–	–	–	9	9	8	0	0.89	1	1	1	0	1.00	–	–	–	–	–	13	12	11	0	0.92	0	11	85%
Lime Village	1	1	0	–	–	–	–	–	–	–	10	10	0	–	–	2	2	0	–	–	1	1	0	–	–	14	14	0	–	0.00	0	–	0%
McGrath	14	5	5	9	2.80	5	5	4	0	0.80	87	43	32	4	0.84	3	3	2	0	0.67	3	3	1	0	0.33	112	59	44	13	0.97	2	55	49%
Takotna	5	0	0	4	–	–	–	–	–	–	16	16	13	0	0.81	–	–	–	–	–	–	–	–	–	–	21	16	13	4	1.06	1	16	76%
Nikolai	7	3	3	4	2.33	2	2	1	0	0.50	24	24	21	0	0.88	1	1	1	0	1.00	2	2	1	0	0.50	36	32	27	4	0.97	0	31	86%
Telida	–	–	–	–	–	–	–	–	–	–	2	2	0	–	–	–	–	–	–	–	–	–	–	–	–	2	2	0	–	0.00	0	–	0%
Upper Kuskokwim	40	18	15	19	1.89	9	9	7	0	0.78	198	154	114	4	0.77	17	17	13	0	0.76	10	10	4	0	0.40	274	208	153	23	0.85	12	164	60%
Kuskokwim River Total	221	99	67	107	1.76	53	53	40	0	0.75	3,307	682	531	519	1.54	301	301	254	0	0.84	113	113	101	0	0.89	3,995	1,996	1,445	174	1.30	151	1,468	37%

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Table 2.–Page 2 of 2.

	Unknown					Does Not Usually Fish					Light Harvester					Medium Harvester					High Harvester					Combined use groups							
Community	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	30	16	10	13	1.44	3	3	3	0	1.00	116	59	51	7	0.98	16	16	13	0	0.81	5	5	4	0	0.80	170	99	81	20	1.02	5	96	56%
Goodnews Bay	11	7	3	4	1.00	1	1	1	0	1.00	57	28	23	5	1.00	4	4	4	0	1.00	–	–	–	–	–	73	40	31	9	1.00	4	36	49%
Platinum	2	1	1	1	2.00	2	2	2	0	1.00	15	15	14	0	0.93	–	–	–	–	–	–	–	–	–	–	19	18	17	1	1.00	3	15	79%
S. Kuskokwim Bay	43	24	14	18	1.33	6	6	6	0	1.00	188	102	88	12	0.98	20	20	17	0	0.85	5	5	4	0	0.80	262	157	129	30	1.01	12	147	56%
Total	264	123	81	125	1.67	59	59	46	0	0.78	3,495	784	619	531	1.47	321	321	271	0	0.84	118	118	105	0	0.89	4,257	2,153	1,574	204	1.27	163	1,615	38%

Note: Dashes indicate data are unavailable. Headings defined as follows: N = the total number of households, S = number selected for survey, ns = number selected and contacted, 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.

[a] Kuskokwim River total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 3.–Reported harvest of Chinook, chum, and coho salmon using USFWS community harvest permits.

	Final Reported		
Community	Chinook	Chum	Sockeye
Kongiganak	–	–	–
N. Kuskokwim Bay	–	–	–
Tuntutuliak	0	0	0
Eek	–	–	–
Kasigluk	88	0	0
Nunapitchuk	317	252	69
Atmautluak	126	112	0
Napakiak	264	5	0
Napaskiak	376	67	19
Oscarville	80	12	15
Bethel	1,648	865	404
Kwethluk	520	160	116
Akiachak	435	0	0
Akiak	300	37	1
Tuluksak	–	–	–
Lower Kuskokwim River	4,154	1,510	624
Lower Kalskag	160	108	5
Upper Kalskag	121	100	8
Aniak	82	17	1
Chuathbaluk	–	–	–
Middle Kuskokwim River	363	225	14
Napaimute[a]	5	5	0
Crooked Creek	–	–	–
Red Devil	0	0	0
Sleetmute	0	0	0
Stony River	0	0	0
Lime Village	–	–	–
McGrath	60	0	0
Takotna	–	–	–
Nikolai	0	0	0
Upper Kuskokwim River	65	5	0
Kuskokwim River Total	4,582	1,740	638
Quinhagak	–	–	–
Goodnews Bay	–	–	–
Platinum	–	–	–
South Kuskokwim Bay	0	0	0
Total Reported Harvest	4,582	1,740	638

[a] Napaimute is not surveyed because it is a seasonal community and most residents winter in other villages. Their harvest is captured through survey in their winter residence. Data from USF&WS OSM

Table 4.–Total estimated subsistence salmon harvest by species and community for the Kuskokwim Area, 2015.

	Households (HH)			Chinook			Chum			Sockeye			Coho			Pink		
Community	Total N	Total n	% survey	Avg harvest/ HH	Est. Total harvest	CI (95%)	Avg harvest/ HH	Est. Total harvest	CI (95%)	Avg harvest/ HH	Est. total harvest	CI (95%)	Avg harvest/ HH	Est. total harvest	CI (95%)	Avg harvest/ HH	Est. total harvest	CI (95%)
Kongiganak [a]	90	0	0%	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	90	0	0%	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	92	58	63%	18	1,668	251	23	2,143	379	22	1,999	313	4	362	91	0	23	14
Eek	92	47	51%	9	850	411	11	1,023	595	12	1,111	452	7	629	356	0	21	13
Kasigluk [b]	107	63	59%	4	438	128	19	2,080	659	13	1,442	287	4	446	197	0	5	2
Nunapitchuk [b]	121	76	63%	9	1,051	156	32	3,883	814	24	2,920	922	10	1,154	458	1	96	53
Atmautluak [b]	68	44	65%	8	514	129	33	2,277	389	17	1,173	261	5	311	57	0	31	0
Napakiak [b]	99	48	48%	9	917	267	15	1,513	468	12	1,179	409	11	1,117	465	0	47	43
Napaskiak [b]	104	62	60%	8	816	115	22	2,240	583	20	2,041	463	13	1,353	440	0	32	25
Oscarville [b]	15	12	80%	8	120	4	24	362	21	20	297	42	2	25	21	0	7	4
Bethel [c]	2,076	388	19%	2	4,918	1,226	6	11,828	3,328	6	12,355	3,301	6	12,277	2,788	0	172	116
Kwethluk [b]	173	99	57%	5	900	95	14	2,390	492	12	2,071	464	10	1,677	379	0	81	33
Akiachak [b]	157	104	66%	7	1,103	108	13	2,085	287	16	2,551	350	12	1,924	376	0	58	40
Akiak [b]	87	45	52%	7	610	112	27	2,385	1,150	21	1,856	570	16	1,423	554	2	189	130
Tuluksak	95	63	66%	2	231	58	18	1,747	307	11	1,037	281	7	623	154	0	27	11
Lower Kuskokwim	3,286	1,109	34%	4	14,136	1,374	11	35,956	3,860	10	32,032	3,631	7	23,321	3,017	0	790	194
Lower Kalskag [b]	74	42	57%	5	351	114	18	1,341	434	7	492	172	6	419	153	0	31	43
Upper Kalskag [b]	62	36	58%	5	334	90	12	742	150	12	726	201	6	384	81	0	28	11
Aniak [b]	180	92	51%	3	542	160	8	1,412	658	13	2,408	866	43	7,705	5,159	2	305	303
Chuathbaluk	29	25	86%	3	90	23	12	342	36	13	382	51	6	166	36	0	5	1
Middle Kuskokwim	345	195	57%	4	1,317	213	11	3,837	793	12	4,008	899	25	8,674	5,126	1	369	303
Crooked Creek	31	24	77%	3	78	52	12	383	81	10	303	67	9	275	98	0	2	2
Red Devil	9	4	44%	6	52	0	5	48	0	10	88	59	24	214	323	0	0	0
Sleetmute	36	23	64%	4	137	42	9	337	38	14	497	107	21	752	50	0	4	0
Stony River	13	11	85%	2	25	7	3	44	30	7	91	41	6	77	64	0	0	0
Lime Village [a]	14	–	0%	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
McGrath [b]	112	55	49%	1	75	23	0	7	9	0	0	0	2	173	94	0	0	0
Takotna	21	16	76%	0	3	3	0	0	0	0	0	0	0	53	57	–	0	0
Nikolai	36	31	86%	8	301	23	56	2,000	0	11	400	0	11	400	0	0	4	0
Telida [a]	2	–	0%	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	274	164	60%	2	671	72	10	2,819	90	5	1,379	133	7	1,944	280	0	10	2

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Table 4.–Page 2 of 2.

	Households (HH)			Chinook			Chum			Sockeye			Coho			Pink		
Community	Total N	Total n	% survey	Avg harvest/ HH	Est. total harvest	CI (95%)	Avg harvest/ HH	Est. total harvest	CI (95%)	Avg harvest/ HH	Est. total harvest	CI (95%)	Avg harvest/ HH	Est. total harvest	CI (95%)	Avg harvest/ HH	Est. total harvest	CI (95%)
Kuskokwim River[d]	3,995	1,468	37%	4	16,124	1,392	11	42,612	3,940	9	37,419	3,741	8	33,939	5,930	0	1,169	359
Quinhagak	73	96	132%	42	3,082	767	9	691	208	15	1,065	244	31	2,238	501	1	46	29
Goodnews Bay	19	36	189%	12	220	93	10	197	82	42	797	263	29	552	230	0	13	14
Platinum	262	15	6%	0	11	8	0	16	9	1	148	86	0	87	21	0	5	4
S. Kuskokwim Bay	354	147	42%	9	3,313	769	3	904	222	6	2,010	362	8	2,877	546	0	64	32
Total	4,349	1,615	37%	4	19,437	1,587	10	43,516	3,946	9	39,429	3,758	8	36,816	5,954	0	1,233	360

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

[a] Villages not surveyed. Harvest was not estimated due to lack of recent data.

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

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

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

Table 5.–Estimated number of salmon retained from commercial fishing for subsistence use, Kuskokwim Area, 2015.

			Chinook		Chum		Sockeye		Coho		Pink	
Community	N	n	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	92	58	51	16	50	0	60	0	17	5	0	0
Eek	92	47	0	0	0	0	0	0	0	0	0	0
Kasigluk	107	63	3	1	1	0	0	0	1	0	0	0
Nunapitchuk	121	74	0	0	0	0	0	0	95	55	0	0
Atmautluak	68	44	0	0	0	0	0	0	31	2	0	0
Napakiak	99	48	0	0	0	0	3	0	0	0	0	0
Napaskiak	104	62	23	6	0	0	13	3	0	0	0	0
Oscarville	15	12	0	0	0	0	0	0	0	0	0	0
Bethel	2,076	388	16	4	0	0	0	0	21	7	5	2
Kwethluk	173	99	0	0	0	0	0	0	0	0	0	0
Akiachak	157	104	10	3	6	2	0	0	0	0	0	0
Akiak	87	45	0	0	0	0	0	0	0	0	0	0
Tuluksak	95	63	0	0	0	0	0	0	0	0	0	0
Lower Kuskokwim	3,286	1,107	103	17	57	2	76	3	164	55	5	2
Lower Kalskag	74	42	0	0	0	0	0	0	0	0	0	0
Upper Kalskag	62	36	0	0	0	0	0	0	0	0	0	0
Aniak	180	92	0	0	0	0	0	0	0	0	0	0
Chuathbaluk	29	25	0	0	0	0	0	0	0	0	0	0
Middle Kuskokwim	345	195	0	0	0	0	0	0	0	0	0	0
Crooked Creek	31	24	0	0	0	0	0	0	0	0	0	0
Red Devil	9	4	–	–	–	–	–	–	–	–	–	–
Sleetmute	36	23	0	0	0	0	0	0	0	0	0	0
Stony River	13	11	0	0	0	0	0	0	0	0	0	0
Lime Village	14	0	–	–	–	–	–	–	–	–	–	–
McGrath	112	55	0	0	0	0	0	0	0	0	0	0
Takotna	21	16	0	0	0	0	0	0	0	0	0	0
Nikolai	36	31	0	0	0	0	0	0	0	0	0	0
Telida	2	0	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	274	164	0	0	0	0	0	0	0	0	0	0
Kuskokwim River[a]	3,995	1,466	103	17	57	2	76	3	164	55	5	2
Quinhagak	170	96	66	28	4	3	12	5	62	22	20	8
Goodnews	73	36	11	7	0	0	22	10	0	0	0	0
Platinum	19	15	1	0	0	0	1	0	1	0	0	0
S. Kuskokwim Bay	262	147	78	29	4	3	36	11	63	22	20	8
Survey Total	4,257	1,613	181	34	62	3	112	12	227	60	26	8

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

[a] Kuskokwim River Total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 6.–Fishing gear reported as the primary type used by subsistence fishermen, Kuskokwim Area, 2015.

Community	N	n	Set net	Drift net	Fish wheel	Hook & Line
Kongiganak	90	0	–	–	–	–
N. Kuskokwim Bay	92	0	–	–	–	–
Tuntutuliak	92	58	15	26	–	–
Eek	92	47	3	21	–	1
Kasigluk	107	63	–	35	–	–
Nunapitchuk	121	76	3	47	–	–
Atmautluak	68	44	–	32	–	–
Napakiak	99	48	4	26	–	–
Napaskiak	104	62	16	24	–	1
Oscarville	15	12	1	6	–	–
Bethel	2,076	388	4	110	–	16
Kwethluk	173	99	9	43	–	4
Akiachak	157	104	15	55	–	1
Akiak	87	45	14	14	–	2
Tuluksak	95	63	15	17	–	3
Lower Kuskokwim	3,508	1,109	99	456	–	28
Lower Kalskag	74	42	5	17	–	–
Upper Kalskag	62	36	5	16	–	–
Aniak	180	92	5	22	2	30
Chuathbaluk	29	25	1	12	1	2
Middle Kuskokwim	345	195	16	67	3	32
Crooked Creek	31	24	–	12	–	2
Red Devil	9	4	1	–	–	3
Sleetmute	36	23	4	12	–	–
Stony River	13	11	4	–	1	1
Lime Village	14	0	–	–	–	–
McGrath	112	55	8	–	–	2
Takotna	21	16	–	–	–	2
Nikolai	36	31	6	–	–	4
Telida	2	0	–	–	–	–
Upper Kuskokwim	274	164	23	24	1	14
Kuskokwim River[a]	4,219	1,468	138	547	4	74
Quinhagak	170	96	4	38	–	30
Goodnews	73	36	8	10	–	6
Platinum	19	15	2	–	–	5
S. Kuskokwim Bay	262	147	14	48	–	41
Total	4,481	1,615	152	595	4	115

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

[a] Kuskokwim River total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 7.–Estimated number of households that subsistence fished in communities surveyed, Kuskokwim Area, 2015.

	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
Community	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	–	–	–	–	–	–	–	–	73	0	–	–	15	0	–	–	2	0	–	–	90	0	–	–
N. Kuskokwim Bay	–	–	–	–	–	–	–	–	73	0	–	–	15	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	8	7	1	0	5	3	0	0	47	21	1	0	25	20	1	0	7	7	1	0	92	58	66	8
Eek	6	5	0	0	3	2	1	0	68	27	1	0	14	12	1	0	1	1	1	–	92	47	49	11
Kasigluk	14	10	0	0	1	1	1	–	71	32	1	0	18	18	1	0	3	2	1	0	107	63	60	10
Nunapitchuk	8	6	0	0	4	3	0	0	77	38	1	0	21	19	1	0	11	10	1	0	121	76	83	9
Atmautluak	10	9	0	0	1	0	–	–	34	12	1	0	16	16	1	0	7	7	1	0	68	44	51	6
Napakiak	15	11	0	0	3	1	0	–	62	22	1	0	17	12	1	0	2	2	1	0	99	48	61	11
Napaskiak	13	10	0	0	4	3	1	0	51	21	1	0	27	21	1	0	9	7	1	0	104	62	69	9
Oscarville	1	1	1	–	–	–	–	–	5	5	0	0	5	2	1	0	4	4	1	0	15	12	9	4
Bethel	–	–	–	–	–	–	–	–	2,076	388	0	0	–	–	–	–	–	–	–	–	2,076	388	717	89
Kwethluk	27	19	0	0	6	5	0	0	98	40	0	0	33	27	1	0	9	8	1	0	173	99	90	12
Akiachak	24	18	1	0	6	5	0	0	77	38	1	0	35	29	1	0	15	14	1	0	157	104	104	10
Akiak	17	9	0	0	1	1	0	–	35	12	1	0	24	18	1	0	10	5	1	0	87	45	54	10
Tuluksak	19	14	1	0	5	4	1	0	46	24	0	0	17	14	1	0	8	7	1	0	95	63	49	7
Lower Kuskokwim	162	119	0	0	39	28	0	0	2,747	680	0	0	252	208	1	0	86	74	1	0	3,286	1,109	1,463	94
Lower Kalskag	9	7	1	0	2	2	0	0	48	20	1	0	10	8	1	0	5	5	1	0	74	42	42	9
Upper Kalskag	8	4	1	0	1	0	–	–	42	22	0	0	4	4	1	0	7	6	1	0	62	36	33	7
Aniak	–	–	–	–	–	–	–	–	180	92	1	0	–	–	–	–	–	–	–	–	180	92	115	13
Chuathbaluk	2	2	1	0	2	1	0	–	19	16	1	0	3	3	1	0	3	3	1	0	29	25	18	2
Middle Kuskokwim	19	13	1	0	5	3	0	0	289	150	1	0	17	15	1	0	15	14	1	0	345	195	208	17
Crooked Creek	5	2	1	0	–	–	–	–	20	18	1	0	6	4	1	0	–	–	–	–	31	24	19	4
Red Devil	–	–	–	–	–	–	–	–	5	2	1	0	2	1	1	–	2	1	1	–	9	4	9	0
Sleetmute	5	4	1	0	2	1	1	–	25	15	1	0	2	2	1	0	2	1	1	–	36	23	25	4
Stony River	3	2	1	0	–	–	–	–	9	8	1	0	1	1	1	–	–	–	–	–	13	11	7	2
Lime Village	1	0	–	–	–	–	–	–	10	0	–	–	2	0	–	–	1	0	–	–	14	0	–	–
McGrath	14	14	0	0	5	3	0	0	87	35	0	0	3	2	0	0	3	1	0	–	112	55	21	9
Takotna	5	4	0	0	–	–	–	–	16	12	0	0	–	–	–	–	–	–	–	–	21	16	3	2
Nikolai	7	7	0	0	2	1	0	–	24	21	0	0	1	1	0	–	2	1	1	–	36	31	12	2
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Upper Kuskokwim	40	33	0	0	9	5	0	0	198	111	0	0	17	11	1	0	10	4	1	–	274	164	95	12
Kuskokwim River[a]	221	165	0	0	53	36	0	0	3,307	941	0	0	301	234	1	0	113	92	1	0	3,995	1,468	1,766	96

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Table 7.–Page 2 of 2.

	Unknown				Does not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
Community	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	30	22	1	0	3	2	0	0	116	56	1	0	16	13	1	0	5	3	1	0	170	96	128	10
Goodnews Bay	11	6	1	0	1	1	0	–	57	26	1	0	4	3	1	0	–	–	–	–	73	36	49	9
Platinum	2	2	0	0	2	1	1	–	15	12	1	0	–	–	–	–	–	–	–	–	19	15	10	2
S. Kuskokwim Bay	43	30	1	0	6	4	0	0	188	94	1	0	20	16	1	0	5	3	1	0	262	147	186	14
Total	264	195	0	0	59	40	0	0	3,495	1,035	0	0	321	250	1	0	118	95	1	0	4,257	1,615	1,952	97

Note: Dashes indicate data are unavailable. Headings defined as follows: 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.

[a] Kuskokwim River total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 8.–Estimated number of people living in communities surveyed, Kuskokwim Area, 2015.

	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
Community	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	–	–	–	–	–	–	–	–	73	0	–	–	15	0	–	–	2	0	–	–	90	0	–	–
N. Kuskokwim Bay	–	–	–	–	–	–	–	–	73	0	–	–	15	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	8	7	5	0	5	3	5	1	47	21	3	0	25	20	5	0	7	6	5	0	92	57	364	34
Eek	6	5	2	0	3	2	5	1	68	27	4	0	14	12	4	0	1	1	4	–	92	47	367	50
Kasigluk	14	9	4	1	1	1	4	–	71	31	6	0	18	18	7	0	3	2	5	1	107	61	612	67
Nunapitchuk	8	6	3	0	4	3	4	1	77	37	5	0	21	19	7	0	11	10	6	0	121	75	647	51
Atmautluak	10	9	4	0	1	0	–	–	34	12	4	1	16	15	6	0	7	7	5	0	68	43	326	40
Napakiak	15	11	3	0	3	1	1	–	62	22	3	0	17	12	4	0	2	2	4	0	99	48	328	46
Napaskiak	13	10	3	0	4	3	5	0	51	20	5	0	27	21	5	0	9	7	3	0	104	61	454	52
Oscarville	1	1	2	–	–	–	–	–	5	5	3	0	5	2	5	2	4	4	5	0	15	12	64	17
Bethel	–	–	–	–	–	–	–	–	2,076	385	3	0	–	–	–	–	–	–	–	–	2,076	385	6,929	342
Kwethluk	27	18	4	0	6	5	3	0	98	39	5	0	33	27	5	0	9	7	7	0	173	96	825	57
Akiachak	24	18	3	0	6	5	5	0	77	38	4	0	35	29	6	0	15	14	6	0	157	104	736	42
Akiak	17	9	3	0	1	1	1	–	35	12	5	1	24	18	5	0	10	5	4	1	87	45	395	53
Tuluksak	19	14	3	0	5	4	3	1	46	24	4	0	17	15	7	0	8	7	7	0	95	64	441	39
Lower Kuskokwim	162	117	4	0	39	28	4	0	2,747	673	4	0	252	208	5	0	86	72	5	0	3,286	1,098	12,488	376
Lower Kalskag	9	6	3	0	2	2	4	0	48	20	4	0	10	8	4	0	5	5	5	0	74	41	275	33
Upper Kalskag	8	4	4	1	1	0	–	–	42	21	3	0	4	4	5	0	7	6	5	0	62	35	211	25
Aniak	–	–	–	–	–	–	–	–	180	93	3	0	–	–	–	–	–	–	–	–	180	93	581	48
Chuathbaluk	2	2	2	0	2	1	4	–	19	16	3	0	3	3	3	0	3	3	4	0	29	25	97	8
Middle Kuskokwim	19	12	3	0	5	3	4	0	289	150	3	0	17	15	4	0	15	14	5	0	345	194	1,164	63
Crooked Creek	5	2	1	0	–	–	–	–	20	18	3	0	6	4	5	0	–	–	–	–	31	24	86	8
Red Devil	–	–	–	–	–	–	–	–	5	2	2	0	2	1	2	–	2	1	2	–	9	4	18	0
Sleetmute	5	4	4	0	2	1	2	–	25	15	3	0	2	2	4	0	2	0	–	–	36	22	106	17
Stony River	3	2	3	1	–	–	–	–	9	8	3	0	1	1	2	–	–	–	–	–	13	11	34	8
Lime Village	1	0	–	–	–	–	–	–	10	0	–	–	2	0	–	–	1	0	–	–	14	0	–	–
McGrath	14	14	3	0	5	3	4	0	87	35	2	0	3	2	2	0	3	1	3	–	112	55	254	27
Takotna	5	4	4	1	–	–	–	–	16	12	2	0	–	–	–	–	–	–	–	–	21	16	55	9
Nikolai	7	7	2	0	2	1	1	–	24	21	3	0	1	1	2	–	2	1	3	–	36	31	91	7
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Upper Kuskokwim	40	33	3	0	9	5	3	0	198	111	2	0	17	11	3	0	10	3	3	–	274	163	644	34
Kuskokwim River[a]	221	162	3	0	53	36	4	0	3,307	934	4	0	301	234	5	0	113	89	5	0	3,995	1,455	14,296	383

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Table 8.–Page 2 of 2.

	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
Community	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	30	22	4	0	3	2	2	0	116	55	4	0	16	13	5	0	5	3	3	0	170	95	731	58
Goodnews Bay	11	6	3	1	1	1	3	–	57	26	3	0	4	3	3	0	–	–	–	–	73	36	244	50
Platinum	2	2	2	0	2	1	3	–	15	12	4	0	–	–	–	–	–	–	–	–	19	15	62	7
S. Kuskokwim Bay	43	30	4	0	6	4	2	0	188	93	4	0	20	16	5	0	5	3	3	0	262	146	1,037	76
Survey Total	264	192	3	0	59	40	3	0	3,495	1,027	4	0	321	250	5	0	118	92	5	0	4,257	1,601	15,333	390

Note: Dashes indicate data are unavailable. Headings defined as follows: 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.

[a] Kuskokwim River total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 9.–Number of fish reported as received from subsistence fisheries, Kuskokwim Area, 2015.

		Chinook			Chum			Sockeye			Coho			Pink		
Community	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	92	53	3	4	53	3	2	53	40	43	53	5	8	53	0	0
Eek	92	47	75	31	46	76	65	46	67	35	47	110	62	47	0	0
Kasigluk	107	62	66	44	62	88	49	62	95	77	62	211	110	62	0	0
Nunapitchuk	121	72	94	58	71	184	101	71	109	73	73	164	133	73	6	8
Atmautluak	68	41	4	2	41	16	6	41	6	2	41	4	3	41	0	0
Napakiak	99	47	50	24	47	103	97	47	113	94	46	33	28	47	0	0
Napaskiak	104	57	43	44	55	92	98	55	69	53	55	38	42	57	0	0
Oscarville	15	11	5	5	11	27	46	11	111	183	11	9	0	11	2	0
Bethel	2,076	379	581	253	377	1,349	462	376	2,424	678	375	3,576	943	378	461	782
Kwethluk	173	95	35	19	94	208	97	95	145	106	95	228	137	95	0	0
Akiachak	157	104	25	9	104	35	20	104	40	22	104	34	15	104	0	0
Akiak	87	44	42	34	43	4	5	43	136	116	43	41	26	43	0	0
Tuluksak	95	62	11	8	62	327	197	62	182	76	62	277	183	62	0	0
Lower Kuskokwim	3,286	1,074	1,033	271	1,066	2,513	544	1,066	3,538	734	1,067	4,729	986	1,073	470	780
Lower Kalskag	74	39	18	12	39	14	3	39	13	11	39	70	14	38	0	0
Upper Kalskag	62	32	16	12	31	5	8	32	33	37	31	6	9	33	0	0
Aniak	180	91	61	33	91	51	34	91	71	62	91	204	123	91	0	0
Chuathbaluk	29	23	4	4	23	16	4	23	4	4	23	32	11	24	1	1
Middle Kuskokwim	345	185	99	37	184	86	35	185	121	72	184	312	124	186	1	1
Crooked Creek	31	22	4	3	22	25	23	22	63	53	22	44	28	22	0	0
Red Devil	9	4	0	0	4	0	0	4	0	0	4	0	0	4	0	0
Sleetmute	36	21	9	8	22	0	0	21	65	55	21	106	110	22	0	0
Stony River	13	11	3	4	11	3	2	11	11	8	11	23	17	11	0	0
Lime Village	14	0	–	–	0	–	–	0	–	–	0	–	–	0	–	–
McGrath	112	55	14	11	55	15	23	55	107	90	55	53	21	55	0	0
Takotna	21	16	0	0	16	0	0	16	0	0	16	0	0	16	0	0
Nikolai	36	31	12	2	31	7	2	31	0	0	31	5	3	31	0	0
Telida	2	0	–	–	0	–	–	0	–	–	0	–	–	0	–	–
Upper Kuskokwim	274	160	42	14	161	51	32	160	245	115	160	230	111	161	0	0
Kuskokwim River[a]	3,995	1,419	1,174	274	1,411	2,649	545	1,411	3,904	746	1,411	5,271	999	1,420	471	780
Quinhagak	170	93	321	113	94	81	42	94	119	54	93	364	165	95	12	13
Goodnews Bay	73	35	98	82	34	7	11	35	113	82	35	100	67	34	9	14
Platinum	19	13	13	8	13	25	23	13	65	47	13	19	10	14	0	0
S. Kuskokwim Bay	262	141	432	138	141	112	48	142	297	105	141	483	177	143	22	19
Survey Total	4,257	1,560	1,605	306	1,552	2,761	547	1,553	4,201	753	1,552	5,753	1,015	1,563	493	780

[a] Kuskokwim River total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 10.–Number of fish reported as received from commercial fisheries, Kuskokwim Area, 2015.

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	92	57	0	0	57	0	0	57	0	0	57	0	0	57	0	0
Eek	92	47	0	0	47	0	0	47	0	0	47	0	0	47	0	0
Kasigluk	107	63	0	0	63	0	0	63	0	0	63	0	0	63	0	0
Nunapitchuk	121	75	0	0	75	0	0	75	0	0	75	0	0	75	0	0
Atmautluak	68	44	0	0	44	0	0	44	0	0	44	11	7	44	0	0
Napakiak	99	48	6	6	48	0	0	48	0	0	48	0	0	48	0	0
Napaskiak	104	61	0	0	61	0	0	61	0	0	61	0	0	61	0	0
Oscarville	15	12	0	0	12	0	0	12	0	0	12	0	0	12	0	0
Bethel	2076	388	0	0	388	0	0	388	0	0	388	0	0	388	0	0
Kwethluk	173	97	0	0	97	0	0	97	0	0	97	0	0	97	0	0
Akiachak	157	104	0	0	104	0	0	104	0	0	104	0	0	104	0	0
Akiak	87	45	0	0	45	0	0	45	0	0	45	0	0	45	0	0
Tuluksak	95	63	0	0	63	0	0	63	0	0	63	0	0	63	0	0
Lower Kuskokwim	3286	1,104	6	6	1,104	0	0	1,104	0	0	1,104	11	7	1,104	0	0
Lower Kalskag	74	42	0	0	42	0	0	42	0	0	42	0	0	42	0	0
Upper Kalskag	62	35	0	0	35	0	0	35	0	0	35	0	0	35	0	0
Aniak	180	92	0	0	92	0	0	92	0	0	92	0	0	92	0	0
Chuathbaluk	29	25	0	0	25	0	0	25	0	0	25	0	0	25	0	0
Middle Kuskokwim	345	194	0	0	194	0	0	194	0	0	194	0	0	194	0	0
Crooked Creek	31	23	0	0	23	0	0	23	0	0	23	0	0	23	0	0
Red Devil	9	4	0	0	4	0	0	4	0	0	4	0	0	4	0	0
Sleetmute	36	22	0	0	22	0	0	22	0	0	22	0	0	22	0	0
Stony River	13	11	0	0	11	0	0	11	0	0	11	0	0	11	0	0
Lime Village	14	0	–	–	0	–	–	0	–	–	0	–	–	0	–	–
McGrath	112	55	0	0	55	0	0	55	0	0	55	0	0	55	0	0
Takotna	21	16	0	0	16	0	0	16	0	0	16	0	0	16	0	0
Nikolai	36	31	0	0	31	0	0	31	0	0	31	0	0	31	0	0
Telida	2	0	–	–	0	–	–	0	–	–	0	–	–	0	–	–
Upper Kuskokwim	274	162	0	0	162	0	0	162	0	0	162	0	0	162	0	0
Kuskokwim River[a]	3995	1,460	6	6	1,460	0	0	1,460	0	0	1,460	11	7	1,460	0	0
Quinhagak	170	96	0	0	96	0	0	96	0	0	96	0	0	96	0	0
Goodnews Bay	73	36	0	0	36	0	0	36	0	0	36	0	0	36	0	0
Platinum	19	15	0	0	15	0	0	15	0	0	15	31	30	15	0	0
S. Kuskokwim Bay	262	147	0	0	147	0	0	147	0	0	147	31	28	147	0	0
Survey Total	4257	1,607	6	6	1,607	0	0	1,607	0	0	1,607	43	28	1,607	0	0

[a] Kuskokwim River total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 11.–Number of people that own dogs, number reporting harvesting salmon for dogs, and number of salmon harvested for dogs, by species, Kuskokwim Area, 2015.

Community	Own dog	Feed salmon	# dogs	Chinook	Chum	Sockeye	Coho	Pink
Kongiganak	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	–	–	–	–	–	–	–	–
Tuntutuliak	45	0	105	0	0	0	0	0
Eek	31	0	53	0	0	0	0	0
Kasigluk	48	0	104	0	0	0	0	0
Nunapitchuk	52	1	96	0	15	0	0	0
Atmautluak	38	0	102	0	0	0	0	0
Napakiak	31	0	58	0	0	0	0	0
Napaskiak	38	3	111	0	60	220	0	20
Oscarville	6	0	12	0	0	0	0	0
Bethel	163	2	288	0	18	0	0	0
Kwethluk	73	1	194	0	0	0	0	4
Akiachak	57	3	146	0	40	240	0	20
Akiak	31	2	144	0	200	0	50	12
Tuluksak	45	1	93	0	50	0	0	0
Lower Kuskokwim	658	13	1,506	0	383	460	50	56
Lower Kalskag	34	1	70	0	80	29	0	0
Upper Kalskag	21	1	69	0	100	0	0	0
Aniak	62	5	202	0	180	1,922	33	110
Chuathbaluk	22	0	41	0	0	0	0	0
Middle Kuskokwim	139	7	382	0	360	1,951	33	110
Crooked Creek	16	0	26	0	0	0	0	0
Red Devil	3	0	6	0	0	0	0	0
Sleetmute	13	4	27	0	141	263	0	0
Stony River	5	0	8	0	0	0	0	0
Lime Village	–	–	–	–	–	–	–	–
McGrath	27	0	60	0	0	0	0	0
Takotna	9	0	22	0	0	0	0	0
Nikolai	19	1	78	25	1,000	195	200	2
Telida	–	–	–	–	–	–	–	–
Upper Kuskokwim	92	5	227	25	1,141	458	200	2
Kuskokwim River[a]	889	25	2,115	25	1,884	2,869	283	168
Quinhagak	64	2	99	4	15	0	0	0
Goodnews Bay	18	0	30	0	0	0	0	0
Platinum	9	1	23	0	0	0	0	1
S. Kuskokwim Bay	91	3	152	4	15	0	0	1
Survey Total	980	28	2,267	29	1,899	2,869	283	169

Note: Dashes indicate data are unavailable. Headings defined as: N = the total number of households, n = the number of households surveyed, # dogs = number of dogs reported / owned by the respondent.

[a] Kuskokwim River Total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 12.–Number of salmon, by species reported as lost due to spoilage, animals, etc., Kuskokwim Area, 2015.

Community	N	n	Households reporting lost fish	Chinook	Chum	Coho	Sockeye	Reason given for loss				
								Animal	Disease	Human	Weather	unknown
Kongiganak	90	0	–	–	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	92	0	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	92	55	2	5	0	20	0	0	0	0	2	0
Eek	92	47	4	12	69	0	26	1	0	0	3	0
Kasigluk	107	62	5	2	43	0	2	1	0	0	3	1
Nunapitchuk	121	73	11	14	60	30	70	0	0	0	10	1
Atmautluak	68	43	6	16	14	0	7	0	0	1	5	0
Napakiak	99	47	2	0	12	4	0	0	1	0	1	0
Napaskiak	104	61	6	3	80	0	41	0	0	0	3	3
Oscarville	15	12	2	0	15	0	0	0	0	0	2	0
Bethel	2,076	387	8	8	80	7	24	1	2	0	1	4
Kwethluk	173	98	15	1	113	56	66	1	0	0	14	0
Akiachak	157	104	14	16	129	40	125	1	0	0	13	0
Akiak	87	45	4	0	50	35	40	0	0	0	4	0
Tuluksak	95	63	11	12	119	84	94	2	0	0	8	1
Lower Kuskokwim	3,508	1,097	90	89	784	276	495	7	3	1	69	10
Lower Kalskag	74	41	1	0	1	0	0	0	1	0	0	0
Upper Kalskag	62	35	1	0	0	4	0	0	1	0	0	0
Aniak	180	92	4	0	0	16	15	1	1	0	2	0
Chuathbaluk	29	25	1	1	4	0	2	0	0	0	1	0
Middle Kuskokwim	345	193	7	1	5	20	17	1	3	0	3	0
Crooked Creek	31	24	2	1	6	1	6	1	0	0	1	0
Red Devil	9	4	0	0	0	0	0	0	0	0	0	0
Sleetmute	36	23	2	5	2	0	22	0	0	1	1	0
Stony River	13	11	0	0	0	0	0	0	0	0	0	0
Lime Village	14	0	–	–	–	–	–	–	–	–	–	–
McGrath	112	55	0	0	0	0	0	0	0	0	0	0
Takotna	21	16	0	0	0	0	0	0	0	0	0	0
Nikolai	36	31	2	10	0	0	0	0	0	0	2	0
Telida	2	0	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	274	164	6	16	8	1	28	1	0	1	4	0
Kuskokwim River[a]	4,219	1,454	103	106	797	297	540	9	6	2	76	10
Quinhagak	170	94	9	7	13	51	12	0	1	0	8	0
Goodnews Bay	73	34	5	10	6	24	32	0	1	0	4	0
Platinum	19	15	2	0	0	1	3	0	0	0	2	0
S. Kuskokwim Bay	262	143	16	17	19	76	47	0	2	0	14	0
Survey Total	4,481	1,597	119	123	816	373	587	9	8	2	90	10

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

[a] Kuskokwim River total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 13.–Comments provided by survey participants regarding the meeting of subsistence needs for Chinook salmon, 2015.

						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	Personal	Equipment	Expenses	Management (-)	Run Dynamics (-)	River Conditions (-)	Weather	Voluntary conservation	Human theft	Animal	unknown
Kongiganak	90	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	90	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	92	57	25	6	26	0	5	1	0	10	3	0	0	1	0	0	6
Eek	92	47	12	6	29	7	7	2	0	8	1	0	1	0	0	0	3
Kasigluk	107	63	4	1	58	6	8	6	1	33	1	0	0	0	0	0	3
Nunapitchuk	121	74	8	2	64	6	9	6	0	37	1	0	1	0	0	0	4
Atmautluak	68	44	3	1	40	2	6	7	0	22	1	0	0	0	0	0	2
Napakiak	99	48	7	4	37	9	2	3	0	17	0	1	1	1	0	0	3
Napaskiak	104	56	2	4	50	7	1	6	0	29	2	0	0	2	0	0	3
Oscarville	15	12	–	–	12	0	3	0	0	5	0	0	0	1	0	0	3
Bethel	2,076	388	43	111	234	30	55	49	0	62	5	0	0	3	0	1	29
Kwethluk	173	99	10	5	84	17	11	9	0	38	1	0	0	2	0	0	6
Akiachak	157	104	9	1	94	13	7	6	0	65	0	0	0	0	0	0	3
Akiak	87	45	4	3	38	9	0	3	0	22	0	0	0	0	0	0	4
Tuluksak	95	63	4	9	50	11	6	5	0	25	1	0	0	0	0	0	2
Lower Kuskokwim	3,286	1,100	131	153	816	117	120	103	1	373	16	1	3	10	0	1	71
Lower Kalskag	74	42	9	5	28	1	6	2	0	12	2	0	0	1	0	0	4
Upper Kalskag	62	36	9	6	21	1	1	3	0	10	2	0	0	1	0	0	3
Aniak	180	92	12	17	63	9	11	2	0	29	4	0	0	3	1	0	4
Chuathbaluk	29	24	5	7	12	2	4	1	0	5	0	0	0	0	0	0	0
Middle Kuskokwim	345	194	35	35	124	13	22	8	0	56	8	0	0	5	1	0	11
Crooked Creek	31	24	2	2	20	4	1	0	0	13	0	0	0	0	0	0	2
Red Devil	9	4	2	1	1	0	0	0	0	1	0	0	0	0	0	0	0
Sleetmute	36	22	4	5	13	0	0	0	0	9	0	0	0	1	0	0	3
Stony River	13	11	4	3	4	1	0	0	0	2	1	0	0	0	0	0	0
Lime Village	14	0	–	–	0	–	–	–	–	–	–	–	–	–	–	–	0
McGrath	112	54	6	16	32	18	5	4	0	3	0	0	0	1	0	0	1
Takotna	21	15	–	9	6	2	2	0	0	0	1	0	0	0	0	0	1
Nikolai	36	31	5	3	23	9	8	2	0	4	0	0	0	0	0	0	0
Telida	2	0	–	–	0	–	–	–	–	–	–	–	–	–	–	–	0
Upper Kuskokwim River	274	161	23	39	99	34	16	6	0	32	2	0	0	2	0	0	7

-continued-

Table 13.–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	Personal	Equipment	Expenses	Management (-)	Run Dynamics (-)	River Conditions (-)	Weather	Voluntary conservation	Human theft	Animal	unknown
Upper Kuskokwim River	274	161	23	39	99	34	16	6	0	32	2	0	0	2	0	0	7
Kuskokwim River[a]	3,995	1,455	189	227	1,039	164	158	117	1	461	26	1	3	17	1	1	89
Quinhagak	170	96	43	7	46	7	13	7	0	4	4	0	0	0	0	0	11
Goodnews Bay	73	36	15	8	13	0	2	1	0	4	4	0	0	0	0	0	2
Platinum	19	15	–	3	12	6	2	0	0	1	3	0	0	0	0	0	0
S. Kuskokwim Bay	262	147	58	18	71	13	17	8	0	9	11	0	0	0	0	0	13
Survey Total	4,257	1,602	247	245	1,110	177	175	125	1	470	37	1	3	17	1	1	102

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

Table 14.–Percentage of estimated Chinook salmon subsistence needs met for households that subsistence fished, Kuskokwim Area, 2015.

Community	*N*	*n*	25% needs met	50% needs met	75% needs met	100% needs met
Kongiganak	90	–	–	–	–	–
N. Kuskokwim Bay	90	–	–	–	–	–
Tuntutuliak	92	41	24%	12%	5%	59%
Eek	92	35	60%	6%	3%	31%
Kasigluk	107	49	84%	12%	2%	2%
Nunapitchuk	121	61	74%	16%	3%	7%
Atmautluak	68	39	79%	10%	3%	8%
Napakiak	99	37	68%	22%	3%	8%
Napaskiak	104	42	74%	12%	7%	7%
Oscarville	15	10	80%	20%	0%	0%
Bethel	2,076	248	77%	7%	4%	12%
Kwethluk	173	74	88%	3%	3%	7%
Akiachak	157	90	79%	11%	3%	7%
Akiak	87	37	73%	24%	0%	3%
Tuluksak	95	45	80%	11%	0%	9%
Lower Kuskokwim	3,508	808	75%	11%	3%	12%
Lower Kalskag	74	28	75%	4%	4%	18%
Upper Kalskag	62	25	68%	12%	0%	20%
Aniak	180	68	79%	10%	4%	6%
Chuathbaluk	29	16	56%	0%	13%	31%
Middle Kuskokwim	345	137	74%	8%	4%	14%
Crooked Creek	31	17	76%	18%	0%	6%
Red Devil	9	3	33%	0%	0%	67%
Sleetmute	36	11	55%	18%	9%	18%
Stony River	13	7	57%	0%	0%	43%
Lime Village	14	–	–	–	–	–
McGrath	112	32	88%	3%	0%	9%
Takotna	21	4	100%	0%	0%	0%
Nikolai	36	25	64%	20%	4%	12%
Telida	2	–	–	–	–	–
Upper Kuskokwim	274	99	73%	11%	2%	14%
Kuskokwim River[a]	4,217	1,044	74%	10%	3%	12%
Quinhagak	170	71	31%	11%	13%	45%
Goodnews Bay	73	24	21%	17%	0%	63%
Platinum	19	10	70%	30%	0%	0%
S. Kuskokwim Bay	262	105	32%	14%	9%	45%
Survey Total	4,479	1,149	70%	11%	4%	15%

Note: Totals may not add to 100% due to rounding error. Dashes indicate data are unavailable. Headings defined as follows: N = the total number of households, n = the number of households surveyed. The percentage is estimated by dividing the total number of fish harvested by the total responders said were needed.

[a] Kuskokwim River total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 15.–Comments provided by survey participants regarding the meeting of subsistence needs for chum salmon, 2015.

						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	Animal	unknown
Kongiganak	90	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	90	–	–	–	–	–	–	–	–	–	–	–	–	–	0
Tuntutuliak	92	57	30	9	18	0	3	0	0	5	3	0	0	0	7
Eek	92	47	13	18	16	5	2	2	0	4	1	0	0	0	2
Kasigluk	107	63	19	9	35	5	4	8	3	10	1	0	0	0	4
Nunapitchuk	121	74	31	6	37	4	11	5	0	6	1	0	1	0	9
Atmautluak	68	44	18	3	23	0	5	4	0	9	1	0	0	0	4
Napakiak	99	48	14	7	27	9	1	3	1	7	1	1	1	0	3
Napaskiak	104	55	17	8	30	5	2	5	0	12	1	0	0	0	5
Oscarville	15	12	5	4	3	0	0	0	0	1	0	0	0	0	2
Bethel	2076	388	77	172	139	26	47	28	1	6	4	0	0	1	26
Kwethluk	173	99	36	7	56	15	9	7	0	15	0	0	0	0	10
Akiachak	157	103	28	10	65	10	9	6	0	34	1	0	0	0	5
Akiak	87	45	13	14	18	3	0	3	0	7	0	0	0	0	5
Tuluksak	95	63	16	7	40	10	4	4	0	18	1	0	0	0	3
Lower Kuskokwim	3,286	1,098	317	274	507	92	97	75	5	134	15	1	2	1	85
Lower Kalskag	74	42	17	8	17	2	3	2	0	3	1	0	0	0	6
Upper Kalskag	62	36	15	16	5	0	1	1	0	0	0	0	0	0	3
Aniak	180	92	19	47	26	8	2	1	0	9	2	0	0	0	4
Chuathbaluk	29	24	10	8	6	1	3	1	0	1	0	0	0	0	0
Middle Kuskokwim	345	194	61	79	54	11	9	5	–	13	3	–	–	0	13
Crooked Creek	31	24	7	6	11	2	0	0	0	5	0	0	0	0	4
Red Devil	9	4	1	3	0	0	0	0	0	0	0	0	0	0	0
Sleetmute	36	22	1	11	10	1	0	0	0	6	1	0	0	0	2
Stony River	13	11	1	7	3	0	1	0	0	2	0	0	0	0	0
Lime Village	14	0	–	–	0	–	–	–	–	–	–	–	–	–	0
McGrath	112	54	2	39	13	6	3	1	0	1	1	0	0	0	1
Takotna	21	15	–	13	2	0	1	0	0	0	0	0	0	0	1
Nikolai	36	31	2	18	11	7	2	0	0	2	0	0	0	0	0
Telida	2	0	–	–	0	–	–	–	–	–	–	–	–	–	0
Upper Kuskokwim	274	161	14	97	50	16	7	1	–	16	2	–	–	0	8
Kuskokwim River[a]	3,995	1,453	392	450	611	119	113	81	5	163	20	1	2	1	106
Quinhagak	170	96	30	35	31	5	7	5	–	2	3	–	1	–	8
Goodnews Bay	73	36	10	17	9	–	3	1	–	1	2	–	–	–	2
Platinum	19	15	3	6	6	4	1	1	–	–	–	–	–	–	0
S. Kuskokwim Bay	262	147	43	58	46	9	11	7	–	3	5	–	1	0	10
Survey Total	4,257	1,600	435	508	657	128	124	88	5	166	25	1	3	1	116

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

Table 16.–Percentage of estimated chum salmon subsistence needs met for households that subsistence fished, Kuskokwim Area, 2015.

Community	N	n	25% needs met	50% needs met	75% needs met	100% needs met
Kongiganak	90	–	–	–	–	–
N. Kuskokwim Bay	90	–	–	–	–	–
Tuntutuliak	92	35	14%	9%	3%	74%
Eek	92	21	33%	14%	10%	43%
Kasigluk	107	40	38%	8%	13%	43%
Nunapitchuk	121	52	37%	8%	6%	50%
Atmautluak	68	36	33%	17%	6%	44%
Napakiak	99	34	41%	15%	6%	38%
Napaskiak	104	37	30%	14%	11%	46%
Oscarville	15	6	0%	17%	0%	83%
Bethel	2,076	172	58%	5%	5%	33%
Kwethluk	173	68	44%	13%	3%	40%
Akiachak	157	73	48%	11%	8%	33%
Akiak	87	23	17%	13%	9%	61%
Tuluksak	95	46	43%	22%	7%	28%
Lower Kuskokwim	3,508	643	42%	11%	6%	41%
Lower Kalskag	74	21	24%	10%	0%	67%
Upper Kalskag	62	14	14%	0%	0%	86%
Aniak	180	35	37%	17%	0%	46%
Chuathbaluk	29	13	15%	15%	0%	69%
Middle Kuskokwim	345	83	27%	12%	0%	61%
Crooked Creek	31	13	38%	15%	0%	46%
Red Devil	9	1	0%	0%	0%	100%
Sleetmute	36	7	29%	43%	14%	14%
Stony River	13	4	50%	25%	0%	25%
Lime Village	14	–	–	–	–	–
McGrath	112	10	80%	0%	0%	20%
Takotna	21	–	–	–	–	–
Nikolai	36	11	73%	9%	0%	18%
Telida	2	–	–	–	–	–
Upper Kuskokwim	274	46	54%	15%	2%	28%
Kuskokwim River[a]	4,217	772	41%	11%	5%	42%
Quinhagak	170	47	23%	17%	6%	53%
Goodnews Bay	73	13	38%	8%	0%	54%
Platinum	19	7	57%	14%	0%	29%
S. Kuskokwim Bay	262	67	30%	15%	4%	51%
Survey Total	4,479	839	40%	11%	5%	43%

Note: Totals may not add to 100% due to rounding error. Dashes indicate data are unavailable. Headings defined as follows: N = the total number of households, n = the number of households surveyed. The percentage is estimated by dividing the total number of fish harvested by the total responders said were needed.

[a] Kuskokwim River Total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 17.–Comments provided by survey participants regarding the meeting of subsistence needs for sockeye salmon, 2015.

						Non-fishery related factors					Natural conditions				
	N	*n*	Needs met	No need	Needs not met	Did not fish	Personal	Equipment	Expenses	Management (-)	Run dynamics (-)	River conditions (-)	Weather	Voluntary conservation	Unknown
Kongiganak	90	0	–	–	–	–	–	–	–	–	–	–	–	–	0
N. Kuskokwim Bay	90	0	–	–	–	–	–	–	–	–	–	–	–	–	0
Tuntutuliak	92	57	31	5	21	0	4	1	0	7	2	0	0	0	7
Eek	92	47	17	7	23	6	5	2	0	6	1	0	0	0	3
Kasigluk	107	63	18	4	41	4	7	6	3	17	1	0	0	0	3
Nunapitchuk	121	74	26	3	45	6	8	6	4	13	1	0	2	0	5
Atmautluak	68	44	10	3	31	3	7	5	0	11	1	0	0	0	4
Napakiak	99	48	18	3	27	9	1	3	0	7	1	1	1	1	3
Napaskiak	104	55	13	4	38	7	1	4	0	21	1	0	0	0	4
Oscarville	15	12	6	1	5	0	0	1	0	2	0	0	0	0	2
Bethel	2,076	388	84	106	199	33	60	45	0	25	2	0	0	0	34
Kwethluk	173	99	27	5	67	16	11	7	0	23	1	0	0	0	9
Akiachak	157	103	22	5	76	11	8	6	0	46	1	0	0	0	4
Akiak	87	45	13	6	26	7	0	5	0	8	0	0	0	0	6
Tuluksak	95	63	9	10	44	12	5	5	0	19	1	0	0	0	2
Lower Kuskokwim	3,286	1,098	294	162	643	114	117	96	7	205	13	1	3	1	86
Lower Kalskag	74	42	14	9	19	1	4	2	0	4	1	0	0	0	7
Upper Kalskag	62	36	19	10	7	1	0	1	0	0	2	0	0	0	3
Aniak	180	92	21	25	45	10	13	2	0	13	3	0	0	1	3
Chuathbaluk	29	24	9	7	8	1	4	1	0	2	0	0	0	0	0
Middle Kuskokwim	345	194	63	51	79	13	21	6	0	19	6	0	0	1	13
Crooked Creek	31	24	7	3	14	2	0	0	0	10	0	0	0	0	2
Red Devil	9	4	2	1	1	0	1	0	0	0	0	0	0	0	0
Sleetmute	36	22	8	2	12	1	1	0	0	6	1	0	0	0	3
Stony River	13	11	4	3	4	1	0	0	0	2	0	1	0	0	0
Lime Village	14	0	–	–	–	–	–	–	–	–	–	–	–	–	–
McGrath	112	53	2	28	23	12	5	2	0	2	0	0	0	0	2
Takotna	21	15	–	12	3	1	1	0	0	0	0	0	0	0	1
Nikolai	36	31	1	29	1	1	0	0	0	0	0	0	0	0	0
Telida	2	0	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	274	160	24	78	58	18	8	2	0	20	1	1	0	0	8
Kuskokwim River[a]	3,905	1,452	381	291	780	145	146	104	7	244	20	2	3	2	107
Quinhagak	170	96	42	15	39	8	7	7	0	3	6	0	1	0	7
Goodnews Bay	73	36	15	6	15	0	3	2	0	3	3	0	1	0	3
Platinum	19	15	5	2	8	5	2	0	0	1	0	0	0	0	0
S. Kuskokwim Bay	262	147	62	23	62	13	12	9	0	7	9	0	2	0	10
Survey Total	4,167	1,599	443	314	842	158	158	113	7	251	29	2	5	2	117

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

Table 18.–Percentage of estimated sockeye salmon subsistence needs met for households that subsistence fished, Kuskokwim Area, 2015.

Community	N	n	25% needs met	50% needs met	75% needs met	100% needs met
Kongiganak	90	–	–	–	–	–
N. Kuskokwim Bay	90	–	–	–	–	–
Tuntutuliak	92	38	13%	16%	3%	68%
Eek	92	30	47%	3%	7%	43%
Kasigluk	107	48	40%	13%	15%	33%
Nunapitchuk	121	53	40%	17%	8%	36%
Atmautluak	68	36	44%	11%	6%	39%
Napakiak	99	35	49%	9%	9%	34%
Napaskiak	104	40	38%	13%	18%	33%
Oscarville	15	9	11%	11%	11%	67%
Bethel	2,076	241	55%	10%	5%	29%
Kwethluk	173	69	59%	12%	4%	25%
Akiachak	157	83	48%	10%	13%	29%
Akiak	87	32	31%	16%	13%	41%
Tuluksak	95	43	60%	12%	9%	19%
Lower Kuskokwim	3,508	757	47%	11%	8%	33%
Lower Kalskag	74	20	30%	15%	0%	55%
Upper Kalskag	62	19	11%	5%	0%	84%
Aniak	180	58	53%	10%	3%	33%
Chuathbaluk	29	14	21%	14%	0%	64%
Middle Kuskokwim	345	111	38%	11%	2%	50%
Crooked Creek	31	16	56%	6%	6%	31%
Red Devil	9	3	33%	0%	0%	67%
Sleetmute	36	17	35%	6%	24%	35%
Stony River	13	8	13%	38%	0%	50%
Lime Village	14	–	–	–	–	–
McGrath	112	19	79%	5%	0%	16%
Takotna	21	1	100%	0%	0%	0%
Nikolai	36	2	50%	0%	0%	50%
Telida	2	–	–	–	–	–
Upper Kuskokwim	274	66	52%	9%	8%	32%
Kuskokwim River[a]	4,217	934	46%	11%	7%	35%
Quinhagak	170	65	34%	9%	5%	52%
Goodnews Bay	73	23	22%	13%	13%	52%
Platinum	19	11	64%	0%	0%	36%
S. Kuskokwim Bay	262	99	34%	9%	6%	51%
Survey Total	4,479	1,033	45%	11%	7%	37%

Note: Totals may not add to 100% due to rounding error. Dashes indicate data are unavailable. Headings defined as follows: N = the total number of households, n = the number of households surveyed. The percentage is estimated by dividing the total number of fish harvested by the total responders said were needed.

[a] Kuskokwim River total includes the Lower, Middle, and Upper Kuskokwim areas and North Kuskokwim Bay.

Table 19.–Comments provided by survey participants regarding the meeting of subsistence needs for coho salmon, 2015.

						Non-fishery related factors					Natural conditions				
	N	*n*	Needs met	No need	Needs not met	Did not fish	Personal	Equipment	Expenses	Management (-)	Run dynamics (-)	River conditions (-)	Weather	Voluntary conservation	Unknown
Kongiganak	90	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	90	0	–	–	–	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	92	57	17	25	15	0	3	2	0	0	1	0	1	0	8
Eek	92	47	16	8	23	9	6	2	0	2	1	0	1	0	2
Kasigluk	107	63	10	15	38	9	4	6	3	8	1	0	3	0	4
Nunapitchuk	121	74	19	13	42	11	7	5	2	4	1	0	7	0	5
Atmautluak	68	44	6	12	26	5	5	8	1	3	1	0	0	0	3
Napakiak	99	48	16	3	29	11	3	3	1	4	0	1	2	1	3
Napaskiak	104	55	17	9	29	5	5	5	0	8	2	0	0	0	4
Oscarville	15	12	2	3	7	1	1	1	1	0	0	0	0	0	3
Bethel	2,076	388	101	99	188	27	70	51	0	8	1	0	1	0	30
Kwethluk	173	99	31	5	63	18	13	13	0	8	1	0	2	0	8
Akiachak	157	103	24	12	67	16	13	7	0	16	1	0	6	0	8
Akiak	87	45	17	3	25	7	1	5	0	5	0	0	1	0	6
Tuluksak	95	63	17	10	36	14	2	3	0	11	0	0	1	0	5
Lower Kuskokwim	3,286	1,098	293	217	588	133	133	111	8	77	10	1	25	1	89
Lower Kalskag	74	42	10	14	18	1	5	2	0	2	1	0	0	0	7
Upper Kalskag	62	36	15	14	7	2	0	2	0	0	0	0	0	0	3
Aniak	180	92	31	17	44	9	16	1	0	4	7	1	1	0	5
Chuathbaluk	29	24	11	7	6	2	2	1	0	1	0	0	0	0	0
Middle Kuskokwim	345	194	67	52	75	14	23	6	0	7	8	1	1	0	15
Crooked Creek	31	24	5	5	14	2	2	1	0	4	0	0	0	0	5
Red Devil	9	4	3	0	1	1	0	0	0	0	0	0	0	0	0
Sleetmute	36	22	8	7	7	0	0	1	0	3	0	0	0	0	3
Stony River	13	11	3	5	3	1	0	0	0	2	0	0	0	0	0
Lime Village	14	0	–	–	0	–	–	–	–	–	–	–	–	–	–
McGrath	112	54	2	18	34	14	10	2	0	2	2	3	0	0	1
Takotna	21	15	0	9	6	2	2	0	0	0	1	0	0	0	1
Nikolai	36	31	2	12	17	12	3	0	0	2	0	0	0	0	0
Telida	2	0	–	–	0	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	274	161	23	56	82	32	17	4	0	13	3	3	0	0	10
Kuskokwim River[a]	3,995	1,453	383	325	745	179	173	121	8	97	21	5	26	1	114
Quinhagak	170	96	50	15	31	5	9	5	0	3	3	0	0	0	6
Goodnews Bay	73	35	14	9	12	0	2	1	0	3	4	0	1	0	1
Platinum	19	15	5	1	9	6	1	2	0	0	0	0	0	0	0
S. Kuskokwim Bay	262	146	69	25	52	11	12	8	0	6	7	0	1	0	7
Survey Total	4,257	1,599	452	350	797	190	185	129	8	103	28	5	27	1	121

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

Table 20.–Percentage of estimated coho salmon subsistence needs met for households that subsistence fished, Kuskokwim Area, 2015.

Community	*N*	*n*	25% needs met	50% needs met	75% needs met	100% needs met
Kongiganak	90	–	–	–	–	–
N. Kuskokwim Bay	90	–	–	–	–	–
Tuntutuliak	92	19	26%	0%	0%	74%
Eek	92	32	38%	9%	9%	44%
Kasigluk	107	37	62%	5%	3%	30%
Nunapitchuk	121	48	60%	0%	6%	33%
Atmautluak	68	25	72%	4%	4%	20%
Napakiak	99	39	62%	3%	3%	33%
Napaskiak	104	33	48%	6%	9%	36%
Oscarville	15	7	57%	29%	0%	14%
Bethel	2,076	239	48%	12%	5%	35%
Kwethluk	173	72	47%	10%	6%	38%
Akiachak	157	77	45%	19%	8%	27%
Akiak	87	32	47%	6%	3%	44%
Tuluksak	95	43	53%	12%	5%	30%
Lower Kuskokwim	3,508	703	50%	10%	5%	35%
Lower Kalskag	74	17	41%	0%	0%	59%
Upper Kalskag	62	17	29%	0%	0%	71%
Aniak	180	63	25%	16%	13%	46%
Chuathbaluk	29	13	23%	8%	0%	69%
Middle Kuskokwim	345	110	28%	10%	7%	55%
Crooked Creek	31	15	33%	20%	13%	33%
Red Devil	9	4	25%	0%	0%	75%
Sleetmute	36	10	50%	10%	0%	40%
Stony River	13	5	20%	0%	40%	40%
Lime Village	14	–	–	–	–	–
McGrath	112	31	71%	13%	10%	6%
Takotna	21	4	100%	0%	0%	0%
Nikolai	36	17	94%	0%	0%	6%
Telida	2	–	–	–	–	–
Upper Kuskokwim	274	86	63%	9%	8%	20%
Kuskokwim River[a]	4,217	899	49%	10%	6%	36%
Quinhagak	170	60	27%	8%	5%	60%
Goodnews Bay	73	22	36%	14%	0%	50%
Platinum	19	12	50%	17%	0%	33%
S. Kuskokwim Bay	262	94	32%	11%	3%	54%
Survey Total	4,479	993	47%	10%	6%	38%

Table 21.–Estimated harvest of non-salmon fish, including those caught in the winter prior to the survey season, Kuskokwim Area, 2015.

	Blackfish		Grayling		Charr/Dolly Varden		Herring		Smelt		Rainbow	
Community	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)
Kongiganak	–	–	–	–	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	–	–	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	17,474	13,598	0	0	32	28	0	0	313	193	0	0
Eek	13,327	7,732	2	2	4	3	1,595	776	1,175	1,321	29	22
Kasigluk	10,841	3,883	0	0	6	4	0	0	2,277	1,781	0	0
Nunapitchuk	28,507	13,454	0	0	0	0	0	0	2,845	2,605	2	1
Atmautluak	9,310	3,800	0	0	9	11	0	0	4,987	2,143	2	1
Napakiak	4,705	3,153	0	0	28	46	1,950	2,027	6,750	2,932	32	27
Napaskiak	11,634	13,365	3	2	101	51	0	0	5,568	1,394	24	21
Oscarville	1,688	1,598	0	0	0	0	0	0	1,152	1,142	2	0
Bethel	34,284	21,665	80	99	767	502	108	191	79,886	19,737	242	166
Kwethluk	16,021	11,237	52	22	32	17	0	0	8,022	1,879	40	20
Akiachak	36,078	11,249	55	23	46	21	271	387	17,644	3,959	24	9
Akiak	6,510	4,470	112	142	139	96	0	0	16,997	7,524	108	102
Tuluksak	5,601	2,700	38	28	62	32	79	66	4,705	1,570	21	15
Lower Kuskokwim	195,980	36,901	343	175	1,224	517	4,002	2,159	152,320	22,126	528	199
Lower Kalskag	2,058	2,780	0	0	0	0	0	0	1,688	762	0	0
Upper Kalskag	679	951	0	0	0	0	0	0	0	0	1	1
Aniak	0	0	101	67	130	83	0	0	3,050	2,608	78	37
Chuathbaluk	0	0	0	0	51	16	0	0	0	0	0	0
Middle Kuskokwim	2,737	2,866	101	67	181	84	0	0	4,738	2,695	79	36
Crooked Creek	0	0	91	51	69	30	0	0	0	0	2	2
Red Devil	0	0	58	63	16	40	0	0	0	0	0	0
Sleetmute	0	0	573	281	0	0	0	0	0	0	0	0
Stony River	0	0	0	0	0	0	0	0	0	0	0	0
Lime Village	–	–	–	–	–	–	–	–	–	–	–	–
McGrath	1,407	1,593	796	482	0	0	0	0	0	0	0	0
Takotna	3	3	43	29	0	0	0	0	0	0	0	0
Nikolai	0	0	102	44	2	2	0	0	0	0	0	0
Telida	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	1,410	1,569	1,662	551	87	38	0	0	0	0	2	2
Kuskokwim River	200,127	37,034	2,106	578	1,492	525	4,002	2,159	157,058	22,282	609	202
Quinhagak	9,053	6,938	267	111	4,305	1,142	2,521	1,312	10,398	2,601	338	142
Goodnews Bay	27	27	43	29	1,898	983	1,149	1,378	3,828	2,169	41	35
Platinum	0	0	43	40	485	361	251	238	419	295	6	4
S. Kuskokwim Bay	9,080	6,908	354	120	6,688	1,523	3,922	1,886	14,644	3,353	385	145
Survey Total	209,207	37,660	2,460	591	8,180	1,600	7,924	2,857	171,702	22,527	994	248

Note: Dashes indicate data are unavailable. Headings defined as follows: 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, 2015.

	Humpback whitefish		Broad whitefish		Cisco		Sheefish		Burbot		Pike	
Community	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)	Total	CI (95%)
Kongiganak	–	–	–	–	–	–	–	–	–	–	–	–
N. Kuskokwim Bay	–	–	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	674	165	764	285	51	20	0	0	594	161	2,400	737
Eek	725	412	449	156	164	50	37	25	534	301	1,190	527
Kasigluk	4,570	1,454	5,000	1,299	239	162	23	15	228	83	5,239	1,108
Nunapitchuk	4,903	2,152	3,859	996	558	259	138	67	550	182	5,573	1,499
Atmautluak	1,472	493	2,194	928	733	570	72	68	480	329	2,868	1,399
Napakiak	1,502	728	1,154	573	125	85	385	376	954	567	8,987	4,219
Napaskiak	3,760	5,307	514	186	632	796	808	804	1,129	809	3,712	1,411
Oscarville	119	2	32	2	27	46	24	27	54	18	1,171	1,279
Bethel	4,288	1,814	1,745	1,138	3,036	3,136	715	262	5,798	3,103	20,441	6,853
Kwethluk	629	282	526	151	297	449	101	34	1,539	802	3,854	1,206
Akiachak	1,330	439	691	240	215	89	485	183	2,937	970	4,522	1,222
Akiak	2,154	1,940	2,206	1,915	2,230	2,859	441	495	2,121	1,372	1,816	821
Tuluksak	491	129	305	87	188	238	49	17	196	101	1,072	388
Lower Kuskokwim	26,618	6,453	19,437	2,949	8,495	4,340	3,279	1,050	17,114	3,758	62,845	8,750
Lower Kalskag	231	190	78	81	0	0	63	29	102	95	98	43
Upper Kalskag	123	46	39	26	0	0	32	16	18	9	122	137
Aniak	1,223	1,053	1,792	1,895	6,257	8,863	232	79	182	197	216	158
Chuathbaluk	165	58	19	20	0	0	33	12	112	22	12	7
Middle Kuskokwim	1,743	1,064	1,928	1,884	6,257	8,799	359	86	414	218	448	210
Crooked Creek	49	39	99	89	126	75	100	33	11	6	18	17
Red Devil	0	0	0	0	0	0	23	24	0	0	36	0
Sleetmute	405	78	176	0	708	0	99	51	10	2	67	15
Stony River	45	22	17	3	0	0	8	8	28	0	6	2
Lime Village	–	–	–	–	–	–	–	–	–	–	–	–
McGrath	105	107	157	109	5	4	262	101	97	122	467	303
Takotna	0	0	0	0	0	0	0	0	0	0	8	6
Nikolai	363	2	180	0	1,203	2	144	13	8	1	1,051	26
Telida	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	967	135	628	137	2,042	72	636	117	154	120	1,652	301
Kuskokwim River total	29,327	6,539	21,993	3,495	16,794	9,766	4,274	1,059	17,682	3,765	64,945	8,755
Quinhagak	729	471	386	421	1,041	395	5	4	34	33	360	263
Goodnews Bay	24	24	0	0	137	118	4	3	0	0	0	0
Platinum	0	0	0	0	101	51	0	0	0	0	0	0
S. Kuskokwim Bay	753	469	386	420	1,279	412	9	5	34	33	360	262
Survey Total	30,080	6,555	22,379	3,520	18,073	9,774	4,282	1,059	17,717	3,765	65,305	8,758

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

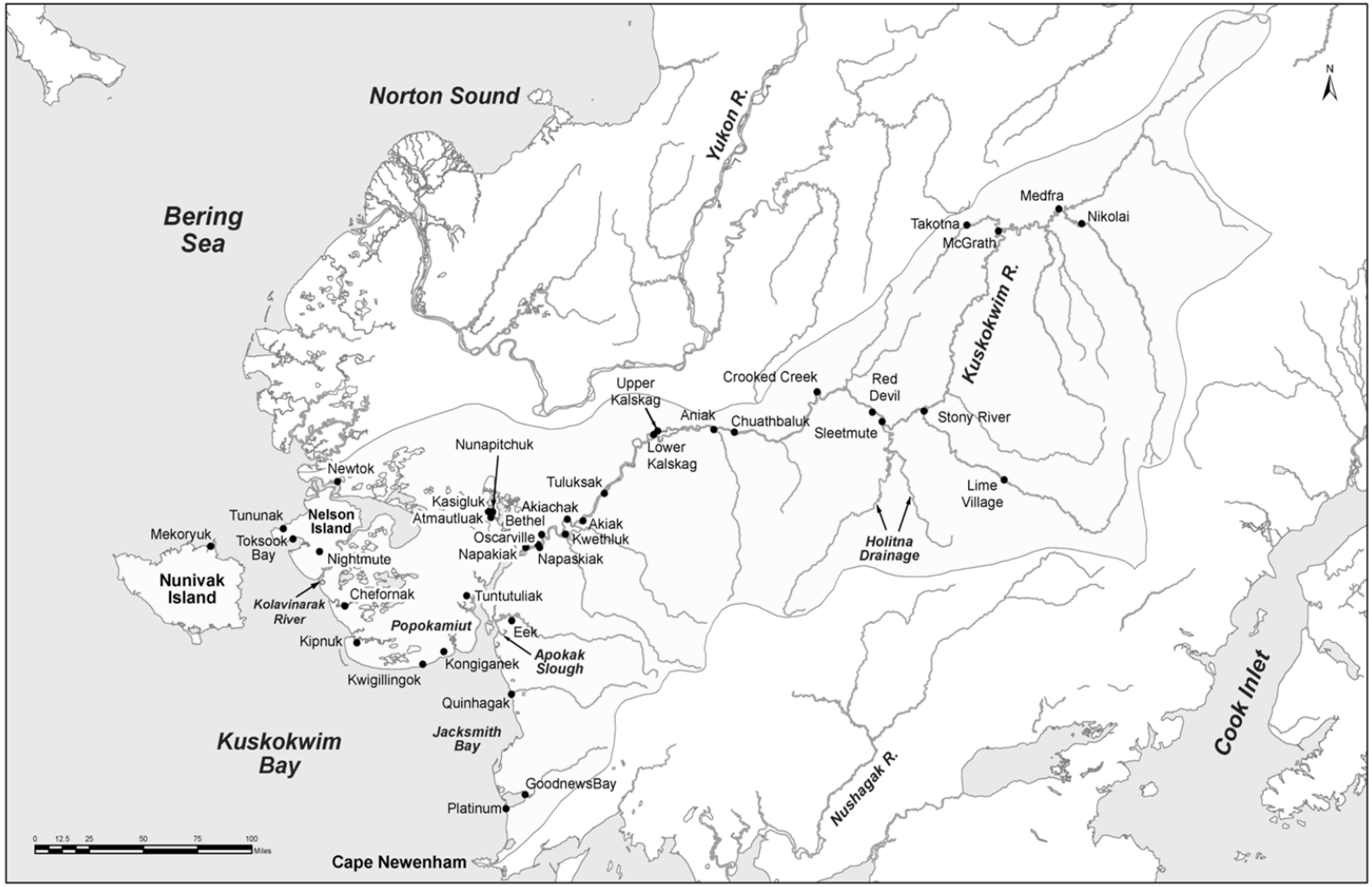

Figure 1.–Kuskokwim Management Area showing communities.

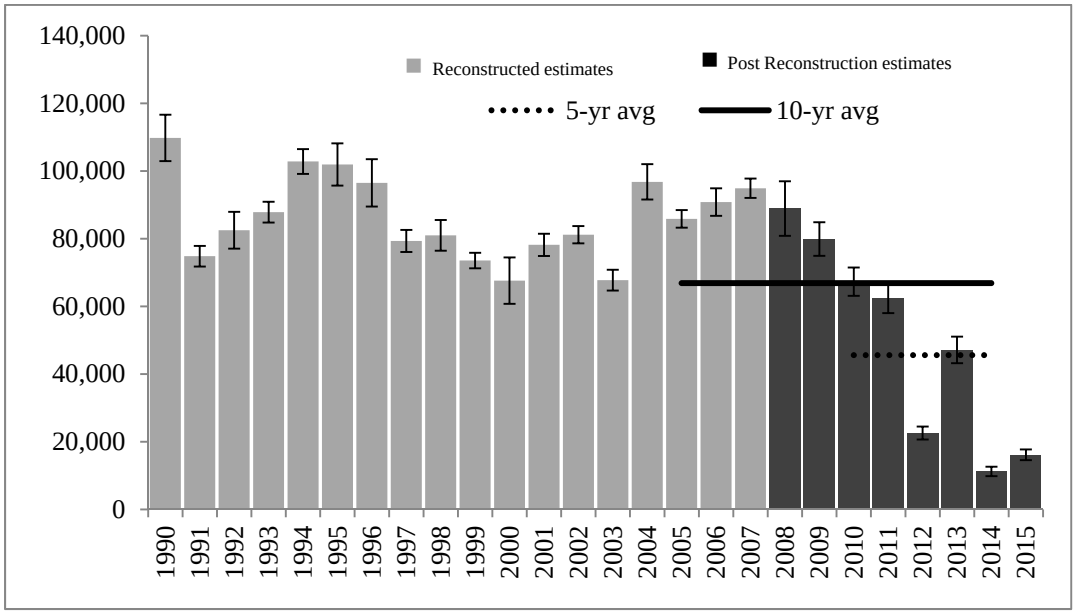

Figure 2.–Historical subsistence harvest estimates of Chinook salmon in the Kuskokwim River.

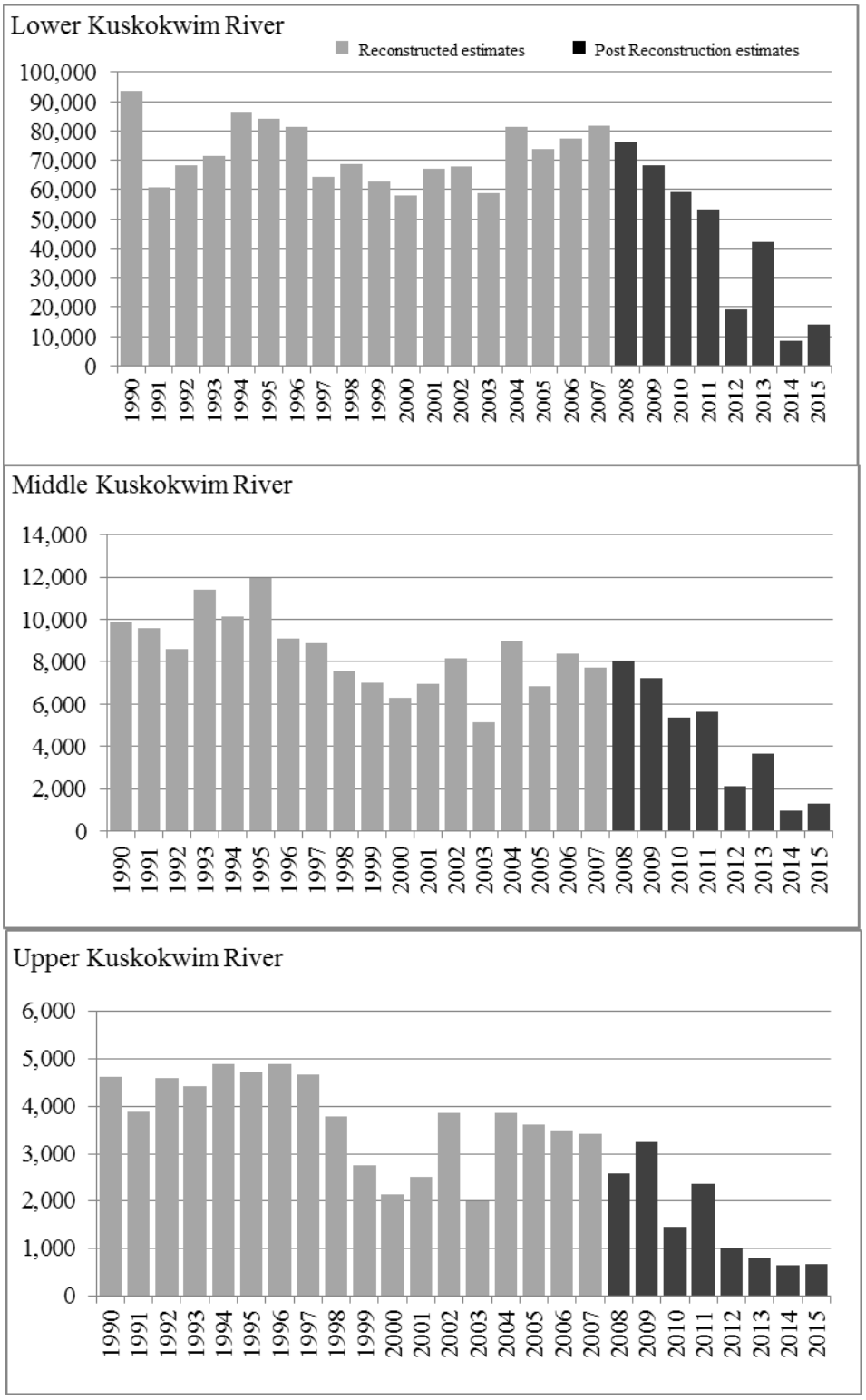

Figure 3.–Historical subsistence harvest estimates of Chinook salmon in the Kuskokwim River by subarea.

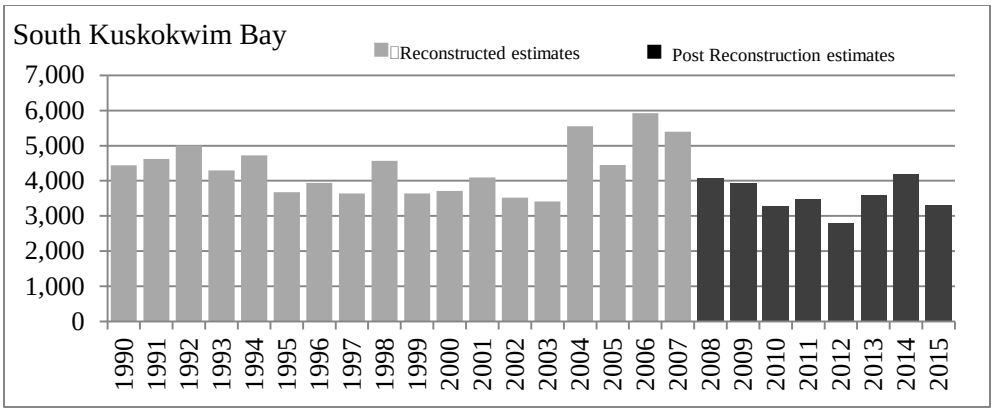

Figure 4.–Historical subsistence harvest estimates of Chinook salmon in the South Kuskokwim Bay by subarea.

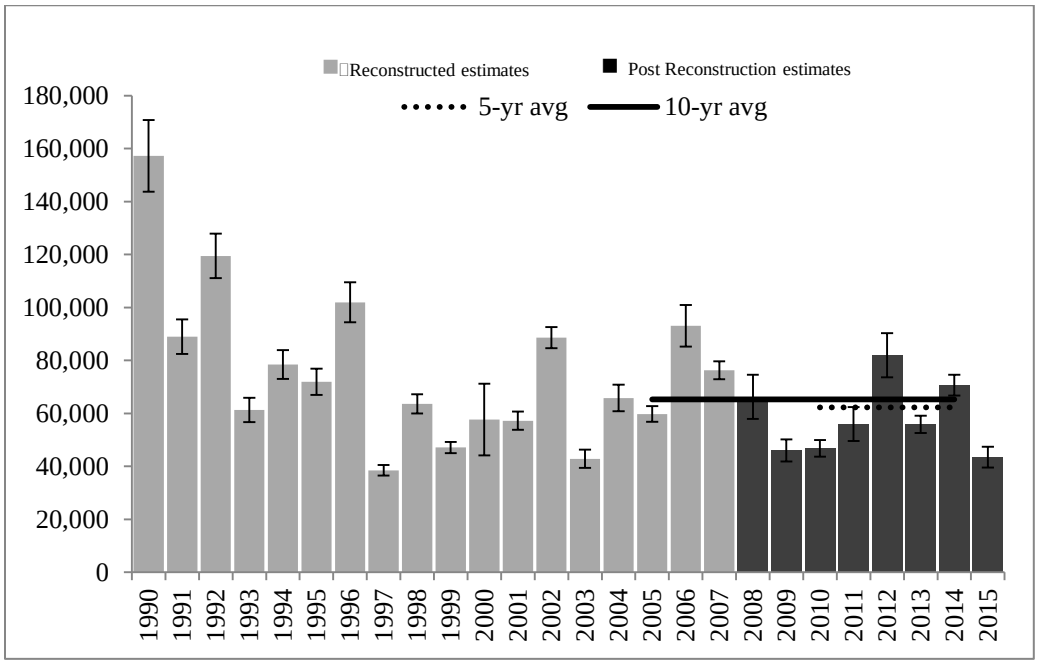

Figure 5.–Historical subsistence harvest estimates of chum salmon in the Kuskokwim Area (Kuskokwim River and Bay).

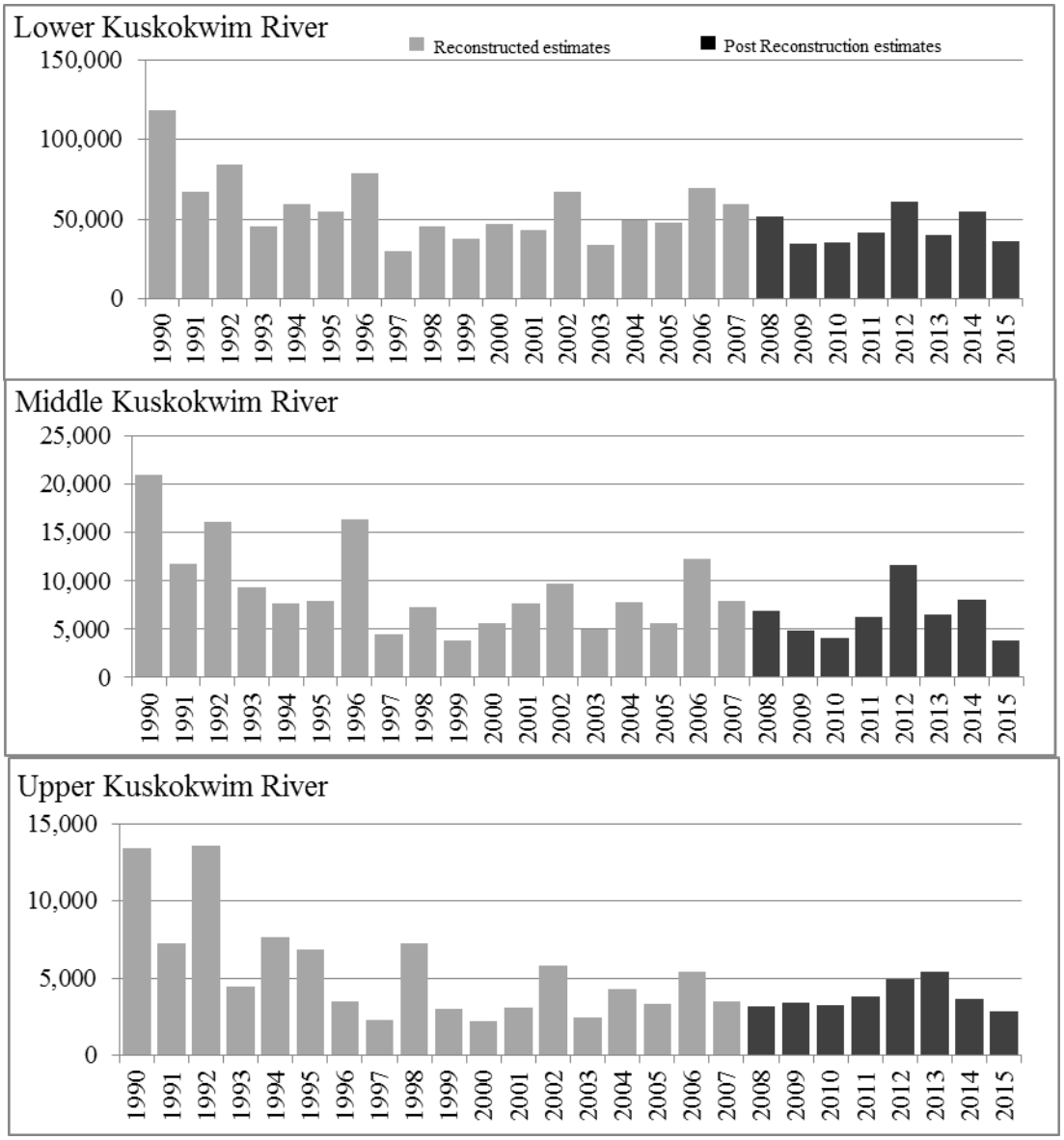

Figure 6.–Historical subsistence harvest estimates of chum salmon in the Kuskokwim River by subarea.

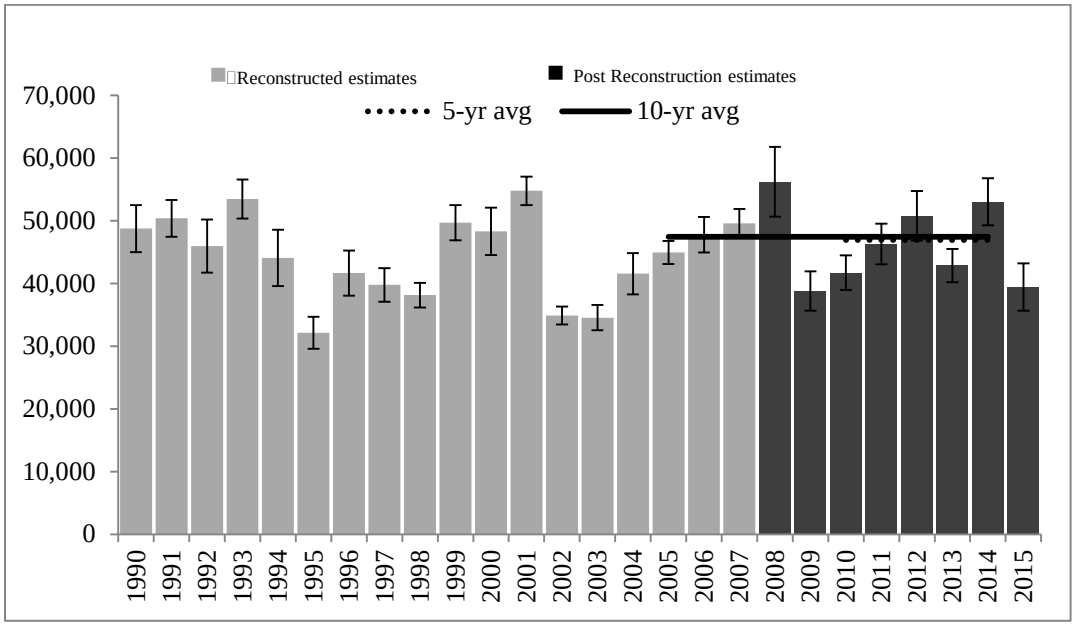

Figure 7.–Historical subsistence harvest estimates of sockeye salmon in the Kuskokwim Area.

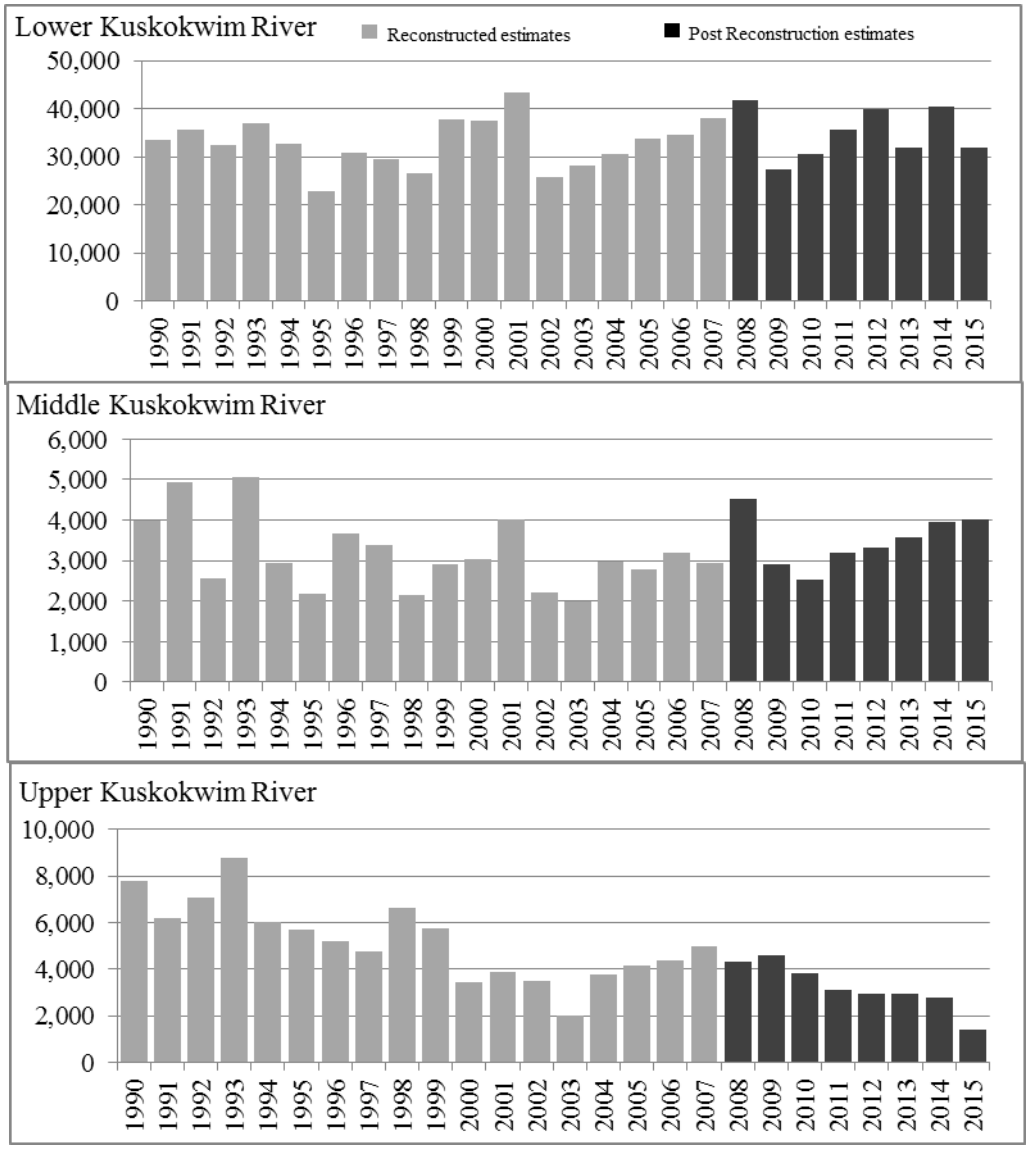

Figure 8.–Historical subsistence harvest estimates of sockeye salmon in the Kuskokwim River by subarea.

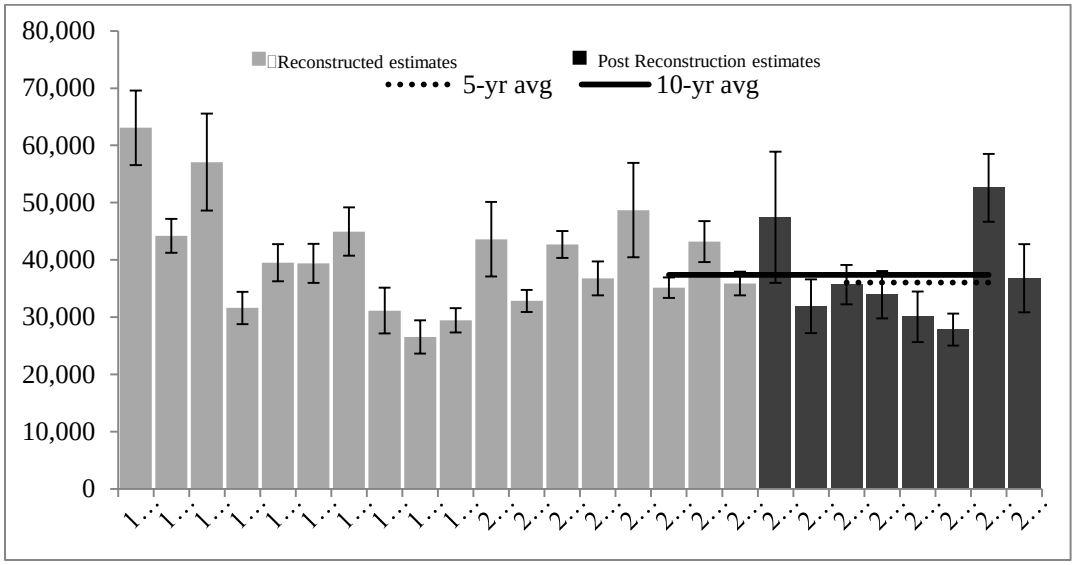

Figure 9.–Historical subsistence harvest estimates of coho salmon in the Kuskokwim Area.

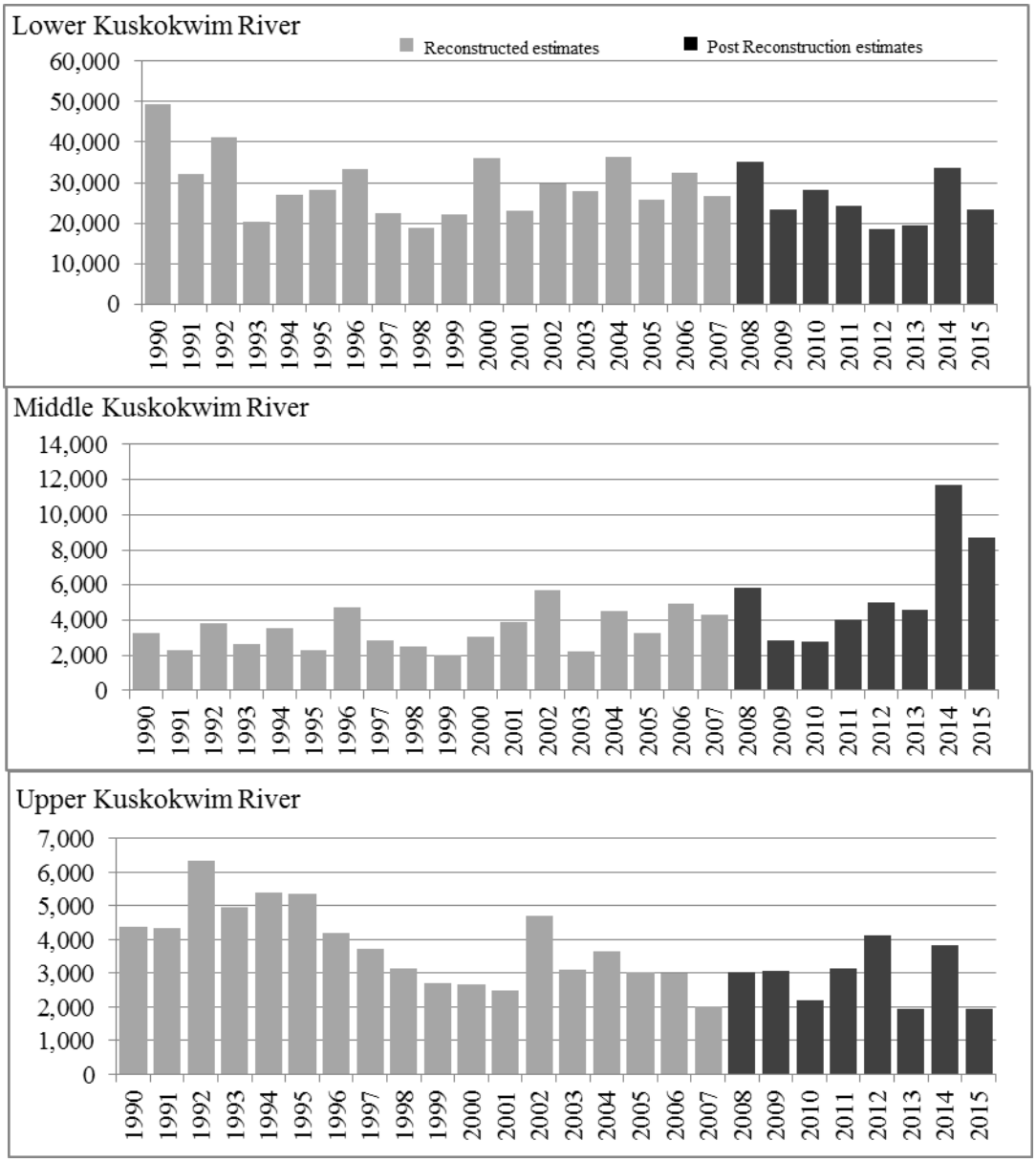

Figure 10.–Historical subsistence harvest estimates of coho salmon in the Kuskokwim River by subarea.

APPENDIX A: HISTORICAL SALMON HARVEST ESTIMATES

Appendix A1.–Estimated number of Chinook salmon harvested for subsistence in the Kuskokwim area, 2005–2015.

Community	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average 2010–2014	Average 2005–2014
Kongiganak [a]	1,536	***1,729***	1,865	2,233	1,243	1,456	1,208	***287***	***641***	***964***	–	911	1,292
N. Kuskokwim Bay	1,536	1,729	1,865	2,233	1,243	1,456	1,208	287	641	964	0	911	1,292
Tuntutuliak	4,545	4,469	***4,614***	4,266	3,067	3,261	3,032	1,123	2,448	***574***	1,668	2,088	2,984
Eek	***3,133***	***2,501***	***2,512***	2,966	1,982	1,761	1,378	1,004	1,188	665	850	1,199	1,773
Kasigluk [b]	***5,242***	***4,905***	***5,167***	2,471	2,464	3,014	2,823	552	2,919	205	438	1,903	2,724
Nunapitchuk [b]	4,103	4,121	***4,661***	4,234	3,468	2,548	3,559	845	2,563	287	1,051	1,960	2,921
Atmautluak [b]	***1,927***	1,758	***1,890***	1,298	1,567	1,088	1,236	234	1,592	108	514	852	1,197
Napakiak [b]	3,060	5,125	3,245	1,903	2,387	1,674	1,963	457	1,588	311	917	1,199	2,073
Napaskiak [b]	4,485	5,877	6,392	4,555	5,372	4,333	3,360	1,108	2,939	422	816	2,432	3,818
Oscarville [b]	1,069	1,052	1,360	1,351	754	618	694	51	585	68	120	403	726
Bethel [c]	28,293	27,805	30,422	27,800	26,170	26,157	25,093	7,321	17,246	3,089	4,918	15,781	21,234
Kwethluk [b]	6,089	7,258	6,466	8,451	7,130	4,440	2,467	1,709	3,192	959	900	2,553	4,675
Akiachak [b]	5,411	5,561	7,621	9,719	7,361	4,470	3,852	2,862	3,585	1,033	1,103	3,160	5,118
Akiak [b]	3,860	4,423	4,297	4,090	3,247	3,625	2,455	***1,218***	1,449	530	610	1,855	2,815
Tuluksak	2,655	***2,372***	3,266	2,937	3,212	2,057	1,230	651	732	404	231	1,015	1,873
Lower Kuskokwim	73,872	77,228	81,914	76,040	68,181	59,046	53,142	19,135	42,026	8,655	14,136	36,401	53,930
Lower Kalskag [b]	1,417	3,494	1,937	1,748	2,525	1,030	1,260	459	744	283	351	755	1,498
Upper Kalskag [b]	2,533	1,569	1,383	2,435	1,696	1,496	1,772	562	1,317	258	334	1,081	1,388
Aniak [b]	1,977	2,412	3,417	3,100	2,130	2,262	2,214	993	1,440	344	542	1,451	2,035
Chuathbaluk	913	***887***	973	772	877	551	409	103	155	90	90	262	535
Middle Kuskokwim	6,840	8,362	7,710	8,055	7,228	5,339	5,655	2,117	3,656	975	1,317	3,548	5,455
Crooked Creek	948	***736***	647	488	608	240	402	124	***145***	35	78	189	381
Red Devil	181	232	301	148	258	33	186	225	77	83	52	121	171
Sleetmute	522	750	861	933	693	272	242	132	96	58	137	160	449
Stony River	***311***	***288***	530	514	704	189	134	***151***	51	24	25	110	287
Lime Village [a]	***171***	***103***	***95***	***29***	***75***	***47***	***118***	29	***43***	***32***	–	54	63
McGrath [b]	910	689	495	288	600	262	829	68	95	173	75	285	389
Takotna	8	***0***	***10***	***0***	***8***	0	0	***0***	***0***	***0***	3	0	2
Nikolai	564	696	471	184	298	402	450	276	283	235	301	329	366
Telida [a]	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	3,615	3,494	3,409	2,584	3,244	1,445	2,361	1,005	790	640	671	1,248	2,108
Kuskokwim River [d]	85,863	90,812	94,898	88,912	79,896	67,286	62,366	22,544	47,113	11,234	16,124	42,108	62,785
Quinhagak	3,505	5,163	4,686	3,125	3,312	2,793	2,588	2,396	3,143	3,723	3,082	2,929	3,437
Goodnews Bay	869	***713***	647	898	569	480	834	389	413	431	220	509	597
Platinum	74	***45***	66	42	61	17	62	24	39	46	11	38	45
South Kuskokwim Bay	4,448	5,921	5,399	4,065	3,942	3,290	3,484	2,809	3,595	4,200	3,313	3,476	4,078
Total Estimated Harvest	90,311	96,733	100,297	92,977	83,838	70,576	65,850	25,353	50,708	15,434	19,437	45,584	66,863

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

[a] Villages not surveyed in 2015. Harvest was not estimated due to lack of recent data.

[b] 2015 estimate includes a tally of Chinook salmon harvested under the USFWS community permits.

[c] The 2015 Bethel estimate contains the permit harvest from both Bethel and the seasonal village of Napaimute.

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

Appendix A2.–Estimated number of chum salmon harvested for subsistence in the Kuskokwim area, 2005–2015.

Community	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average 2010–2014	Average 2005–2014
Kongiganak [a]	1,960	2,420	***2,353***	1,755	1,420	2,522	2,809	***1,638***	***1,397***	***1,915***	–	2,056	2,019
N. Kuskokwim Bay	1,960	2,420	2,353	1,755	1,420	2,522	2,809	1,638	1,397	1,915	0	2,056	2,019
Tuntutuliak	3,568	4,024	3,350	***3,375***	3,330	2,439	1,865	2,614	2,180	***2,967***	2,143	2,413	2,971
Eek	**877**	***1,075***	***783***	***788***	782	721	486	1,552	1,232	1,182	1,023	1,035	948
Kasigluk [b]	***4,194***	***5,461***	***4,309***	***1,502***	1,857	2,338	2,029	3,261	2,197	3,612	2,080	2,687	3,076
Nunapitchuk [b]	4,167	5,150	**6,619**	***4,705***	3,468	3,223	4,257	5,312	2,977	5,213	3,883	4,196	4,509
Atmautluak [b]	1,940	***2,337***	2,193	*2,177*	1,665	1,386	1,864	2,701	2,409	3,327	2,277	2,337	2,200
Napakiak [b]	3,238	8,143	3,628	1,313	1,638	1,759	1,546	1,711	1,185	2,392	1,513	1,719	2,655
Napaskiak [b]	2,205	4,323	3,032	2,400	1,451	3,110	1,783	3,216	2,589	3,171	2,240	2,774	2,728
Oscarville [b]	686	1,151	932	847	534	352	402	599	490	599	362	488	659
Bethel [c]	14,273	20,953	16,540	15,853	10,055	9,575	15,324	26,872	12,506	18,017	11,828	16,459	15,997
Kwethluk [b]	4,328	6,328	6,291	5,729	4,111	3,112	3,484	3,849	3,825	4,318	2,390	3,718	4,538
Akiachak [b]	2,428	4,333	4,782	6,856	2,872	2,856	3,205	4,150	3,417	4,744	2,085	3,674	3,964
Akiak [b]	3,528	3,095	4,141	3,522	1,350	1,163	2,421	***2,925***	2,212	2,982	2,385	2,341	2,734
Tuluksak	2,183	3,094	***3,202***	2,920	1,570	3,180	2,697	2,585	3,062	2,274	1,747	2,760	2,677
Lower Kuskokwim	47,615	69,466	59,803	51,988	34,683	35,214	41,363	61,347	40,281	54,798	35,956	46,601	49,656
Lower Kalskag [b]	997	4,703	1,997	1,004	930	691	1,643	3,284	1,214	1,458	1,341	1,658	1,792
Upper Kalskag [b]	1,201	2,469	294	2,432	329	391	1,599	1,930	1,534	1,038	742	1,298	1,322
Aniak [b]	2,952	3,722	4,108	2,830	2,602	2,515	2,391	5,667	2,880	4,695	1,412	3,630	3,436
Chuathbaluk	530	1,451	***1,541***	593	937	535	686	796	935	805	342	751	881
Middle Kuskokwim	5,680	12,345	7,940	6,859	4,798	4,132	6,319	11,677	6,563	7,996	3,837	7,337	7,431
Crooked Creek	1,064	1,513	***813***	352	519	539	862	610	***1,803***	391	383	841	847
Red Devil	214	41	186	188	244	122	434	516	981	284	48	467	321
Sleetmute	422	1,475	818	373	367	524	689	1,004	542	633	337	678	685
Stony River	***324***	***790***	***540***	1,247	771	338	516	***491***	***27***	***89***	44	292	513
Lime Village [a]	***573***	***316***	***419***	***297***	***405***	***314***	***499***	419	909	295	–	487	445
McGrath [b]	***470***	999	464	676	825	944	476	885	598	642	7	709	698
Takotna	*4*	0	***0***	***0***	***0***	***0***	0	***0***	***12***	***0***	**0**	2	2
Nikolai	230	308	223	54	292	440	349	1,044	513	1,356	2,000	740	481
Telida [a]	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	3,301	5,442	3,464	3,187	3,423	3,221	3,825	4,970	5,386	3,690	2,819	4,218	3,991
Kuskokwim River [d]	58,555	89,674	73,560	63,789	44,324	45,089	54,316	79,631	53,627	68,398	42,612	60,212	63,096
Quinhagak	994	2,754	2,249	1,794	1,557	1,347	1,255	2,001	1,958	1,959	691	1,704	1,787
Goodnews Bay	192	555	*395*	586	138	324	349	322	153	268	197	283	328
Platinum	21	108	*77*	106	28	37	70	76	90	62	16	67	67
South Kuskokwim Bay	1,207	3,417	2,720	2,486	1,723	1,708	1,674	2,399	2,201	2,289	904	2,054	2,182
Total Estimated Harvest	59,762	93,091	76,281	66,275	46,047	46,797	55,990	82,030	55,828	70,687	43,516	62,266	65,279

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

[a] Villages not surveyed in 2015. Harvest was not estimated due to lack of recent data.

[b] 2015 estimate includes a tally of chum salmon harvested under the USFWS community permits.

[c] The 2015 Bethel estimate contains the permit harvest from both Bethel and the seasonal village of Napaimute.

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

Appendix A3.–Estimated number of sockeye salmon harvested for subsistence in the Kuskokwim area, 2005–2015.

Community	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average 2010–2014	Average 2005–2014
Kongiganak [a]	1,103	1,464	***960***	1,502	1,018	1,869	1,266	***1,307***	***1,031***	***1,230***	–	1,341	1,294
N. Kuskokwim Bay	1,103	1,464	960	1,502	1,018	1,869	1,266	1,307	1,031	1,230	0	1,341	1,294
Tuntutuliak	2,145	1,834	1,763	***2,120***	932	2,068	1,274	1,516	1,183	***1,774***	1,999	1,563	1,607
Eek	1,033	***684***	***558***	***834***	1,019	1,241	664	1,490	1,319	1,450	1,111	1,233	1,029
Kasigluk [b]	***1,634***	***2,248***	***1,786***	***1,041***	1,215	1,441	1,269	1,451	1,470	1,990	1,442	1,524	1,546
Nunapitchuk [b]	1,821	1,871	2,147	***2,549***	1,538	1,902	2,223	2,396	1,806	2,059	2,920	2,077	2,055
Atmautluak [b]	1,444	***1,012***	1,041	***1,250***	624	731	827	1,623	1,316	1,531	1,173	1,206	1,106
Napakiak [b]	2,122	1,845	1,962	1,244	917	1,183	1,351	1,141	1,105	1,573	1,179	1,271	1,369
Napaskiak [b]	1,344	1,784	1,738	2,620	1,579	1,979	1,587	2,065	2,069	2,514	2,041	2,043	1,993
Oscarville [b]	278	778	712	677	332	250	228	323	347	679	297	365	481
Bethel [c]	14,297	12,816	13,902	15,247	11,272	11,103	16,946	18,282	12,616	14,828	12,355	14,755	14,112
Kwethluk [b]	2,457	2,770	3,536	4,920	2,432	2,534	2,357	2,884	2,705	5,921	2,071	3,280	3,340
Akiachak [b]	2,372	2,661	3,269	4,354	2,407	2,433	2,647	3,443	2,594	3,047	2,551	2,833	2,984
Akiak [b]	1,920	2,000	3,695	2,881	1,290	1,161	2,576	***1,818***	1,731	2,418	1,856	1,941	2,174
Tuluksak	987	2,247	***1,845***	2,133	1,691	2,483	1,699	1,380	1,541	622	1,037	1,545	1,738
Lower Kuskokwim	33,854	34,550	37,955	41,869	27,248	30,509	35,648	39,812	31,802	40,406	32,032	35,635	35,533
Lower Kalskag [b]	439	1,434	780	1,583	1,044	507	802	891	977	1,040	492	843	1,006
Upper Kalskag [b]	945	563	417	1,000	369	460	938	770	662	839	726	734	669
Aniak [b]	1,015	692	1,261	1,585	923	1,165	1,168	1,375	1,466	1,578	2,408	1,350	1,246
Chuathbaluk	369	508	***484***	363	564	403	300	297	480	481	382	392	431
Middle Kuskokwim	2,768	3,197	2,942	4,531	2,900	2,535	3,208	3,333	3,585	3,938	4,008	3,320	3,352
Crooked Creek	693	544	***523***	220	329	302	243	234	***514***	391	303	337	367
Red Devil	272	510	318	359	477	475	502	511	270	151	88	382	397
Sleetmute	673	1,181	1,303	1,164	684	1,024	693	715	362	541	497	667	852
Stony River	***688***	***746***	***1,019***	1,476	977	372	303	***469***	447	137	91	346	661
Lime Village [a]	***1,368***	***1,216***	***1,406***	***659***	***1,080***	***932***	***739***	780	***831***	***888***	–	834	948
McGrath [b]	***454***	149	375	417	965	650	630	233	538	451	0	500	490
Takotna	***1***	0	***1***	***3***	***3***	***2***	0	***2***	***2***	***3***	0	2	2
Nikolai	10	20	14	13	66	65	13	0	0	236	400	63	47
Telida [a]	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	4,160	4,365	4,960	4,310	4,581	3,822	3,123	2,945	2,964	2,798	1,379	3,130	3,763
Kuskokwim River [d]	41,885	43,577	46,817	52,213	35,747	38,735	43,245	47,396	39,382	48,372	37,419	43,426	43,943
Quinhagak	1,745	3,128	1,755	2,097	1,960	1,719	1,582	2,015	2,158	2,939	1,065	2,083	2,150
Goodnews Bay	1,213	995	***920***	1,739	902	1,093	1,328	1,197	1,113	1,370	797	1,220	1,184
Platinum	90	63	***121***	156	186	175	135	173	181	349	148	203	171
South Kuskokwim Bay	3,048	4,186	2,796	3,992	3,048	2,987	3,045	3,385	3,452	4,658	2,010	3,505	3,505
Total Estimated Harvest	44,933	47,763	49,613	56,205	38,795	41,722	46,290	50,781	42,834	53,030	39,429	46,931	47,448

-continued-

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

[a] Villages not surveyed in 2015. Harvest was not estimated due to lack of recent data.

[b] 2015 estimate includes a tally of sockeye salmon harvested under the USFWS community permits.

[c] The 2015 Bethel estimate contains the permit harvest from both Bethel and the seasonal village of Napaimute.

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

Appendix A4.–Estimated number of coho salmon harvested for subsistence in the Kuskokwim area, 2005–2015.

Community	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average 2010–2014	Average 2005–2014
Kongiganak [a]	740	657	883	***557***	561	483	613	***356***	***412***	***561***	–	485	582
N. Kuskokwim Bay	740	657	883	557	561	483	613	356	412	561	0	485	582
Tuntutuliak	1,074	948	703	1,620	***359***	698	250	565	450	***794***	362	551	746
Eek	378	773	***459***	***661***	***176***	315	280	612	483	555	629	449	469
Kasigluk	1,304	***3,070***	***1,753***	***867***	***629***	1,043	430	303	418	851	446	609	1,067
Nunapitchuk	807	692	1,752	508	***286***	195	407	319	226	1,305	1,154	490	650
Atmautluak	530	254	***424***	262	***67***	36	263	383	203	176	311	212	260
Napakiak	742	2,363	1,244	1,006	420	877	927	402	634	740	1,117	716	936
Napaskiak	602	1,640	639	903	786	1,029	471	269	772	1,153	1,353	739	826
Oscarville	60	175	180	62	67	12	43	38	37	128	25	52	80
Bethel	12,994	18,810	12,972	15,839	12,895	20,426	18,141	13,280	12,662	19,364	12,277	16,775	15,738
Kwethluk	3,048	1,245	1,624	7,262	4,333	1,495	1,097	1,013	1,555	4,422	1,677	1,916	2,709
Akiachak	1,817	1,714	2,355	4,311	1,790	1,181	1,440	714	1,106	1,845	1,924	1,257	1,827
Akiak	1,847	379	1,325	1,358	661	475	505	***455***	454	1,501	1,423	678	896
Tuluksak	484	498	1,131	***635***	857	330	163	341	473	808	623	423	572
Lower Kuskokwim	25,687	32,561	26,561	35,293	23,326	28,112	24,417	18,694	19,473	33,642	23,321	24,868	26,777
Lower Kalskag	319	1,415	515	76	318	96	684	1,107	529	907	419	665	597
Upper Kalskag	594	1,799	381	2,350	181	92	998	360	636	938	384	605	833
Aniak	2,032	1,018	3,003	2,883	2,223	2,533	2,215	3,365	3,102	9,566	7,705	4,156	3,194
Chuathbaluk	346	727	419	***525***	96	76	109	179	319	291	166	195	309
Middle Kuskokwim	3,291	4,959	4,318	5,834	2,818	2,797	4,006	5,011	4,586	11,702	8,674	5,620	4,932
Crooked Creek	312	401	289	***952***	283	87	297	149	***255***	198	275	197	322
Red Devil	331	171	193	307	126	88	130	238	318	792	214	313	269
Sleetmute	581	671	360	228	403	458	426	784	219	993	752	576	512
Stony River	468	***322***	***336***	***552***	634	201	333	***358***	120	177	77	238	350
Lime Village [a]	372	***132***	***443***	***695***	***210***	***146***	***596***	117	***384***	***226***	–	294	332
McGrath	799	***894***	279	247	1,175	1,053	1,331	2,257	523	1,189	173	1,271	975
Takotna	8	***0***	8	***6***	***28***	***20***	3	***22***	***0***	***0***	53	9	9
Nikolai	166	407	95	53	203	135	20	214	119	256	400	149	167
Telida [a]	–	–	–	–	–	–	–	–	–	–	–	–	–
Upper Kuskokwim	3,037	2,998	2,005	3,040	3,062	2,188	3,136	4,139	1,938	3,831	1,944	3,046	2,937
Kuskokwim River[b]	32,755	41,175	33,766	44,724	29,767	33,580	32,172	28,200	26,409	49,736	33,939	34,019	35,228
Quinhagak	1,558	1,315	1,550	1,869	1,824	1,599	1,369	1,380	1,087	2,240	2,238	1,535	1,579
Goodnews Bay	634	605	***468***	769	261	319	259	382	295	371	552	325	436
Platinum	223	116	***106***	114	81	197	143	124	50	240	87	151	139
South Kuskokwim Bay	2,415	2,036	2,124	2,752	2,166	2,115	1,771	1,886	1,432	2,851	2,877	2011	2155
Total Estimated Harvest	35,170	43,211	35,890	47,476	31,933	35,695	33,943	30,086	27,841	52,587	36,816	36,030	37,383

-continued-

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

[a] Villages not surveyed in 2015. Harvest was not estimated due to lack of recent data.

[b] 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, 2015.

Date of Survey:_____ Time: _____

Person Interviewed:_____

Relation to HH: _____Interviewer: _____

HHID #	COMMUNITY:	Data Entry:	Error Check:

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		
Area		Chinook			Sockeye			Chum			Coho			Pink		

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 ☐

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-continued-

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:_____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** ☐

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APPENDIX C: FISH MEASURES

Appendix C1.–Approximate measurements used to convert reported amounts of fish harvest, Kuskokwim Area, 2008–2014.

Amount	Description
Salmon	
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
Other fish	
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

APPENDIX D: EXPANDED HARVEST FOR SURVEYED COMMUMITIES

Appendix D1.–Expanded harvest of Chinook salmon for communities surveyed, Kuskokwim Area, 2015.

	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
Community	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	–	–	–	–	–	–	–	–	73	0	–	–	15	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	8	6	3	2	5	3	10	6	47	21	8	2	25	19	35	3	7	7	48	0	92	56	1,668	251
Eek	6	5	0	0	3	2	0	0	68	25	9	3	14	10	13	3	1	1	42	–	92	43	850	411
Kasigluk	14	10	2	1	1	0	–	–	71	30	2	1	18	17	6	1	3	2	12	7	107	59	350	128
Nunapitchuk	8	6	0	0	4	3	0	0	77	37	3	1	21	19	17	2	11	9	11	2	121	74	734	156
Atmautluak	10	9	0	0	1	0	–	–	34	11	5	2	16	16	6	0	7	7	15	0	68	43	388	129
Napakiak	15	11	8	3	3	1	0	–	62	21	5	2	17	12	11	2	2	2	25	0	99	47	653	267
Napaskiak	13	10	3	1	4	3	0	0	51	21	1	0	27	20	11	2	9	7	7	2	104	61	440	115
Oscarville	1	1	0	–	–	–	–	–	5	5	4	0	5	2	1	0	4	4	4	0	15	12	40	4
Bethel	–	–	–	–	–	–	–	–	2,076	386	2	0	–	–	–	–	–	–	–	–	2,076	386	3,265	1,226
Kwethluk	27	19	0	0	6	4	0	0	98	39	1	0	33	26	6	1	9	7	3	1	173	95	380	95
Akiachak	24	17	0	0	6	5	1	0	77	38	3	1	35	26	5	1	15	14	17	2	157	100	668	108
Akiak	17	9	0	0	1	1	0	–	35	12	1	0	24	17	7	2	10	4	9	4	87	43	310	112
Tuluksak	19	14	0	0	5	4	3	1	46	24	1	0	17	14	8	1	8	7	6	1	95	63	231	58
Lower Kalskag	9	7	3	1	2	2	0	0	48	18	2	1	10	8	4	1	5	5	5	0	74	40	191	114
Upper Kalskag	8	4	1	0	1	0	–	–	42	22	3	1	4	3	2	1	7	6	10	2	62	35	213	90
Aniak	–	–	–	–	–	–	–	–	180	92	3	0	–	–	–	–	–	–	–	–	180	92	460	160
Chuathbaluk	2	2	0	0	2	1	0	–	19	16	3	1	3	3	3	0	3	3	7	0	29	25	90	23
Crooked Creek	5	2	0	0	–	–	–	–	20	18	1	0	6	4	9	4	–	–	–	–	31	24	78	52
Red Devil	–	–	–	–	–	–	–	–	5	2	0	0	2	1	12	–	2	1	14	–	9	4	52	0
Sleetmute	5	4	2	1	2	1	0	–	25	14	3	1	2	2	4	0	2	1	27	–	36	22	137	42
Stony River	3	2	0	0	–	–	–	–	9	7	1	0	1	1	15	–	–	–	–	–	13	10	25	7
Lime Village	1	0	–	–	–	–	–	–	10	0	–	–	2	0	–	–	1	0	–	–	14	0	–	–
McGrath	14	14	0	0	5	3	0	0	87	35	0	0	3	2	0	0	3	1	0	–	112	55	15	23
Takotna	5	4	0	0	–	–	–	–	16	12	0	0	–	–	–	–	–	–	–	–	21	16	3	3
Nikolai	7	7	4	0	2	1	0	–	24	21	3	0	1	1	0	–	2	1	97	–	36	31	301	23
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Quinhagak	30	22	23	4	3	2	0	0	116	52	16	3	16	12	30	4	5	3	5	2	170	91	3,082	767
Goodnews Bay	11	6	2	1	1	1	0	–	57	24	2	1	4	3	15	4	–	–	–	–	73	34	220	93
Platinum	2	2	0	0	2	1	0	–	15	12	1	0	–	–	–	–	–	–	–	–	19	15	11	8

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

Appendix D2.–Expanded harvest of chum salmon for communities surveyed, Kuskokwim Area, 2015.

	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
Community	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	–	–	–	–	–	–	–	–	73	0	–	–	15	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	8	6	2	1	5	3	6	4	47	21	10	3	25	18	43	4	7	7	79	0	92	55	2,143	379
Eek	6	5	0	0	3	2	0	0	68	24	11	4	14	10	18	3	1	1	15	–	–	42	1,023	595
Kasigluk	14	10	5	2	1	0	–	–	71	29	14	5	18	17	43	3	3	2	74	8	107	58	2,080	659
Nunapitchuk	8	6	0	0	4	3	0	0	77	37	19	5	21	19	70	5	11	10	62	5	121	75	3,631	814
Atmautluak	10	9	0	0	1	0	–	–	34	11	26	6	16	16	46	0	7	7	73	0	68	43	2,165	389
Napakiak	15	11	7	2	3	1	0	–	62	21	10	3	17	11	41	6	2	2	45	0	99	46	1,508	468
Napaskiak	13	10	11	5	4	3	7	3	51	21	11	4	27	20	41	7	9	7	34	5	104	61	2,173	583
Oscarville	1	1	0	–	–	–	–	–	5	5	18	0	5	2	3	2	4	4	61	0	15	12	350	21
Bethel	–	–	–	–	–	–	–	–	2,076	381	5	1	–	–	–	–	–	–	–	–	2,076	381	10,958	3,328
Kwethluk	27	18	2	1	6	4	0	0	98	39	8	2	33	26	32	3	9	7	42	10	173	94	2,230	492
Akiachak	24	18	1	0	6	5	12	5	77	38	9	1	35	26	21	3	15	14	38	2	157	101	2,085	287
Akiak	17	9	3	2	1	1	0	.	35	11	5	2	24	16	45	5	10	4	104	55	87	41	2,348	1,150
Tuluksak	19	14	11	4	5	4	18	8	46	24	4	1	17	14	40	6	8	7	71	7	95	63	1,747	307
Lower Kalskag	9	6	4	2	2	2	0	0	48	18	14	4	10	8	27	7	5	5	48	0	74	39	1,233	434
Upper Kalskag	8	4	0	0	1	0	–	–	42	22	4	1	4	4	28	0	7	6	51	7	62	36	642	150
Aniak	–	–	–	–	–	–	–	–	180	92	8	2	–	–	–	–	–	–	–	–	180	92	1,395	658
Chuathbaluk	2	2	0	0	2	1	0	–	19	16	7	1	3	3	26	0	3	3	43	0	29	25	342	36
Crooked Creek	5	2	0	0	–	–	–	–	20	18	8	1	6	4	38	5	–	–	–	–	31	24	383	81
Red Devil	–	–	–	–	–	–	–	–	5	2	0	0	2	1	0	–	2	1	24	–	9	4	48	0
Sleetmute	5	4	3	1	2	1	0	–	25	15	2	1	2	2	16	0	2	1	121	–	36	23	337	38
Stony River	3	2	8	4	–	–	–	–	9	8	1	0	1	1	10	–	–	–	–	–	13	11	44	30
Lime Village	1	0	–	–	–	–	–	–	10	0	–	–	2	0	–	–	1	0	–	–	14	0	–	–
McGrath	14	14	0	0	5	3	0	0	87	35	0	0	3	2	0	0	3	1	0	–	112	55	7	9
Takotna	5	4	0	0	–	–	–	–	16	12	0	0	–	–	–	–	–	–	–	–	21	16	0	0
Nikolai	7	6	0	0	2	1	0	–	24	21	0	0	1	1	0	–	2	1	1,000	–	36	30	2,000	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Quinhagak	30	22	2	0	3	2	0	0	116	52	5	1	16	12	7	1	5	3	0	0	170	91	691	208
Goodnews Bay	11	6	3	1	1	1	0	–	57	24	1	0	4	3	24	6	–	–	–	–	73	34	197	82
Platinum	2	2	0	0	2	1	0	–	15	12	1	0	–	–	–	–	–	–	–	–	19	15	16	9

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

Appendix D3.–Expanded harvest of sockeye salmon for communities surveyed, Kuskokwim Area, 2015.

	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
Community	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	–	–	–	–	–	–	–	–	73	0	–	–	15	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	8	6	2	1	5	3	3	2	47	21	6	1	25	18	47	6	7	7	77	0	92	55	1,999	313
Eek	6	5	0	0	3	2	0	0	68	24	12	3	14	10	20	4	1	1	25	–	92	42	1,111	452
Kasigluk	14	10	7	3	1	0	–	–	71	30	9	2	18	17	34	2	3	2	31	5	107	59	1,442	287
Nunapitchuk	8	6	0	0	4	3	0	0	77	37	18	6	21	19	41	2	11	10	54	4	121	75	2,851	922
Atmautluak	10	9	0	0	1	0	–	–	34	11	14	4	16	16	21	0	7	7	49	0	68	43	1,173	261
Napakiak	15	11	3	1	3	1	0	–	62	20	9	3	17	11	28	5	2	2	39	0	99	45	1,179	409
Napaskiak	13	10	23	10	4	3	3	1	51	21	8	2	27	20	38	5	9	7	33	5	104	61	2,022	463
Oscarville	1	1	0	–	–	–	–	–	5	5	25	0	5	2	5	4	4	4	33	0	15	12	282	42
Bethel	–	–	–	–	–	–	–	–	2,076	382	6	1	–	–	–	–	–	–	–	–	2,076	382	11,951	3,301
Kwethluk	27	19	1	0	6	4	0	0	98	39	8	2	33	27	29	3	9	7	18	5	173	96	1,955	464
Akiachak	24	18	5	1	6	5	7	3	77	38	11	2	35	26	22	3	15	14	50	3	157	101	2,551	350
Akiak	17	9	2	1	1	1	0	–	35	11	11	5	24	17	37	5	10	4	54	17	87	42	1,855	570
Tuluksak	19	14	4	2	5	4	8	2	46	24	4	2	17	14	25	6	8	7	42	5	95	63	1,037	281
Lower Kalskag	9	7	2	1	2	2	0	0	48	18	6	2	10	8	10	2	5	5	18	0	74	40	487	172
Upper Kalskag	8	4	0	0	1	0	–	–	42	22	6	2	4	3	32	8	7	6	48	8	62	35	718	201
Aniak	–	–	–	–	–	–	–	–	180	92	13	2	–	–	–	–	–	–	–	–	180	92	2,407	866
Chuathbaluk	2	2	0	0	2	1	0	–	19	16	10	1	3	3	22	0	3	3	43	0	29	25	382	51
Crooked Creek	5	2	8	6	–	–	–	–	20	18	4	1	6	4	32	1	–	–	–	–	31	24	303	67
Red Devil	–	–	–	–	–	–	–	–	5	2	6	4	2	1	0	–	2	1	30	–	9	4	88	59
Sleetmute	5	4	9	3	2	1	1	–	25	14	8	2	2	2	21	0	2	1	104	–	36	22	497	107
Stony River	3	2	10	6	–	–	–	–	9	8	5	1	1	1	15	–	–	–	–	–	13	11	91	41
Lime Village	1	0	–	–	–	–	–	–	10	0	–	–	2	0	–	–	1	0	–	–	14	0	–	–
McGrath	14	14	0	0	5	3	0	0	87	35	0	0	3	2	0	0	3	1	0	–	112	55	0	0
Takotna	5	4	0	0	–	–	–	–	16	12	0	0	–	–	–	–	–	–	–	–	21	16	0	0
Nikolai	7	6	0	0	2	1	0	–	24	21	0	0	1	1	0	–	2	1	200	–	36	30	400	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Quinhagak	30	22	6	1	3	2	0	0	116	52	5	1	16	12	16	2	5	3	6	4	170	91	1,065	244
Goodnews Bay	11	6	9	3	1	1	0	–	57	24	9	2	4	3	52	17	–	–	–	–	73	34	797	263
Platinum	2	2	0	0	2	1	0	–	15	12	10	3	–	–	–	–	–	–	–	–	19	15	148	86

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

Appendix D4.–Expanded harvest of coho salmon for surveyed communities, Kuskokwim Area, 2015.

	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
Community	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	–	–	–	–	–	–	–	–	73	0	–	–	15	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	8	7	1	1	5	3	0	0	47	21	0	0	25	18	9	2	7	7	15	0	92	56	362	91
Eek	6	5	0	0	3	2	2	1	68	24	7	3	14	10	10	2	1	1	20	–	92	42	629	356
Kasigluk	14	9	1	1	1	0	–	–	71	30	2	1	18	17	12	1	3	2	17	10	107	58	446	197
Nunapitchuk	8	6	0	0	4	3	0	0	77	36	9	3	21	19	12	1	11	10	20	3	121	74	1,154	458
Atmautluak	10	9	1	0	1	0	–	–	34	10	10	8	16	16	3	0	7	6	13	2	68	41	311	57
Napakiak	15	11	5	2	3	1	0	–	–	21	6	2	17	11	36	11	2	2	16	0	99	46	1,117	465
Napaskiak	13	10	6	3	4	3	7	3	51	21	5	3	27	20	33	6	9	7	12	3	104	61	1,353	440
Oscarville	1	1	3	–	–	–	–	–	5	5	0	0	5	2	3	2	4	4	2	0	15	12	25	21
Bethel	–	–	–	–	–	–	–	–	2,076	383	6	1	–	–	–	–	–	–	–	–	2,076	383	12,277	2,788
Kwethluk	27	19	1	0	6	5	0	0	98	40	9	2	33	27	18	2	9	7	19	3	173	98	1,677	379
Akiachak	24	18	2	0	6	5	0	0	77	38	8	2	35	26	14	3	15	14	50	6	157	101	1,924	376
Akiak	17	9	4	2	1	1	0	–	35	11	10	4	24	17	31	5	10	4	25	19	87	42	1,423	554
Tuluksak	19	14	8	2	5	4	15	5	46	24	4	1	17	14	12	3	8	7	3	1	95	63	623	154
Lower Kalskag	9	7	3	1	2	2	0	0	48	18	5	2	10	8	9	2	5	5	15	0	74	40	419	153
Upper Kalskag	8	4	0	0	1	0	–	–	42	22	2	1	4	4	19	0	7	6	32	4	62	36	384	81
Aniak	–	–	–	–	–	–	–	–	180	92	43	14	–	–	–	–	–	–	–	–	180	92	7,705	5,159
Chuathbaluk	2	2	8	0	2	1	0	–	19	16	5	1	3	3	5	0	3	3	12	0	29	25	166	36
Crooked Creek	5	2	7	5	–	–	–	–	20	18	4	1	6	4	28	6	–	–	–	–	31	24	275	98
Red Devil	–	–	–	–	–	–	–	–	5	2	30	23	2	1	20	–	2	1	12	–	9	4	214	323
Sleetmute	5	4	7	2	2	1	0	–	25	14	2	1	2	2	0	0	2	1	329	–	36	22	752	50
Stony River	3	2	15	9	–	–	–	–	9	7	4	1	1	1	0	–	–	–	–	–	13	10	77	64
Lime Village	1	0	–	–	–	–	–	–	10	0	–	–	2	0	–	–	1	0	–	–	14	0	–	–
McGrath	14	14	1	0	5	3	4	3	87	35	2	1	3	2	0	0	3	1	0	–	112	55	173	94
Takotna	5	4	0	0	–	–	–	–	16	12	3	2	–	–	–	–	–	–	–	–	21	16	53	57
Nikolai	7	6	0	0	2	1	0	–	24	21	0	0	1	1	0	.	2	1	200	–	36	30	400	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Quinhagak	30	22	12	1	3	2	0	0	116	52	13	2	16	12	15	2	5	3	22	10	170	91	2,238	501
Goodnews Bay	11	6	10	5	1	1	0	–	57	24	4	1	4	3	56	19	–	–	–	–	73	34	552	230
Platinum	2	2	0	0	2	1	14	–	15	12	4	1	–	–	–	–	–	–	–	–	19	15	87	21

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

Appendix D5.–Expanded harvest of pink salmon for communities surveyed, Kuskokwim Area, 2015.

	Unknown				Not usually harvest				Light harvesters				Medium harvesters				High harvesters				Combined use groups			
Community	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	–	–	–	–	–	–	–	–	73	0	–	–	15	0	–	–	2	0	–	–	90	0	–	–
Tuntutuliak	8	6	0	0	5	3	0	0	47	21	0	0	25	19	1	0	7	7	1	0	92	56	23	14
Eek	6	5	0	0	3	2	1	0	68	24	0	0	14	10	1	0	1	1	0	–	92	42	21	13
Kasigluk	14	10	0	0	1	0	–	–	71	30	0	0	18	17	0	0	3	2	0	0	107	59	5	2
Nunapitchuk	8	6	1	0	4	3	0	0	77	37	1	0	21	19	1	0	11	10	1	0	121	75	96	53
Atmautluak	10	9	0	0	1	0	–	–	34	11	0	0	16	16	0	0	7	7	4	0	68	43	31	0
Napakiak	15	11	3	1	3	1	0	–	62	22	0	0	17	12	0	0	2	2	0	0	99	48	47	43
Napaskiak	13	10	0	0	4	3	0	0	51	21	0	0	27	21	0	0	9	7	3	1	104	62	32	25
Oscarville	1	1	0	–	–	–	–	–	5	5	0	0	5	2	1	0	4	4	1	0	15	12	7	4
Bethel	–	–	–	–	–	–	–	–	2,076	386	0	0	–	–	–	–	–	–	–	–	2,076	386	172	116
Kwethluk	27	19	0	0	6	5	0	0	98	40	0	0	33	27	2	0	9	7	1	0	173	98	81	33
Akiachak	24	18	0	0	6	5	0	0	77	38	0	0	35	26	1	0	15	14	0	0	157	101	58	40
Akiak	17	9	0	0	1	1	0	.	35	11	0	0	24	17	5	2	10	5	5	4	87	43	189	130
Tuluksak	19	14	0	0	5	4	1	0	46	24	0	0	17	14	1	0	8	7	1	0	95	63	27	11
Lower Kalskag	9	7	0	0	2	2	0	0	48	18	1	0	10	8	0	0	5	5	0	0	74	40	31	43
Upper Kalskag	8	4	0	0	1	0	–	–	42	22	0	0	4	4	0	0	7	6	3	1	62	36	28	11
Aniak	–	–	–	–	–	–	–	–	180	92	2	1	–	–	–	–	–	–	–	–	180	92	305	303
Chuathbaluk	2	2	0	0	2	1	0	–	19	16	0	0	3	3	0	0	3	3	1	0	29	25	5	1
Crooked Creek	5	2	0	0	–	–	–	–	20	18	0	0	6	4	0	0	–	–	–	–	31	24	2	2
Red Devil	–	–	–	–	–	–	–	–	5	2	0	0	2	1	0	–	2	1	0	–	9	4	0	0
Sleetmute	5	4	0	0	2	1	0	–	25	15	0	0	2	2	0	0	2	1	2	–	36	23	4	0
Stony River	3	2	0	0	–	–	–	–	9	8	0	0	1	1	0	–	–	–	–	–	13	11	0	0
Lime Village	1	0	–	–	–	–	–	–	10	0	–	–	2	0	–	–	1	0	–	–	14	0	–	–
McGrath	14	14	0	0	5	3	0	0	87	35	0	0	3	2	0	0	3	1	0	–	112	55	0	0
Takotna	5	4	0	0	–	–	–	–	16	12	0	0	–	–	–	–	–	–	–	–	21	16	0	0
Nikolai	7	7	0	0	2	1	0	–	24	21	0	0	1	1	0	–	2	1	2	–	36	31	4	0
Telida	–	–	–	–	–	–	–	–	2	0	–	–	–	–	–	–	–	–	–	–	2	0	–	–
Quinhagak	30	22	1	0	3	2	0	0	116	52	0	0	16	13	0	0	5	3	0	0	170	92	46	29
Goodnews Bay	11	6	0	0	1	1	0	–	57	24	0	0	4	3	3	2	–	–	–	–	73	34	13	14
Platinum	2	2	0	0	2	1	0	–	15	12	0	0	–	–	–	–	–	–	–	–	19	15	5	4

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