Technical Paper No. 502

Subsistence Fisheries Harvest Monitoring Report, Kuskokwim Fisheries Management Area, Alaska, 2022

by
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and
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May 2024 **Division of Subsistence**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in Division of Subsistence reports. All others, including deviations from definitions listed below, are noted in the text at first mention, in the titles or footnotes of tables, and in figures or figure captions.

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance:	
population	Var
sample	var

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ABSTRACT

The Alaska Department of Fish and Game, in partnership with the Orutsararmiut Native Council in Bethel, conducted a voluntary survey program to estimate subsistence salmon harvest for the Kuskokwim River drainage and south Kuskokwim Bay in 2022. This study was a continuation of the Kuskokwim Management Area subsistence salmon monitoring program, which has documented annual subsistence salmon harvests since 1960. In addition to the ongoing COVID pandemic, staffing shortages and subsequent logistical issues presented challenges during the 2022 survey season. These challenges prompted various enhancements to methodologies in order to facilitate the collection of harvest information. Harvest information was collected through both postseason household surveys and phone surveys. Simple random sampling methods were used in the community of Bethel whereas all other participating outlying communities returned to the utilization of stratified sampling methods. Subsistence salmon harvest information was collected by Orutsararmiut Native Council fisheries technicians in the community of Bethel while Alaska Department of Fish and Game staff surveyed the remaining communities. Households were surveyed in 27 communities, including most communities within the Kuskokwim River drainage and south Kuskokwim Bay. In 2022, subsistence salmon fishers reported harvesting five species of Pacific salmon, including Chinook *Oncorhynchus tshawytscha*, chum *O. keta*, sockeye *O. nerka*, coho *O. kisutch*, and pink salmon *O. gorbuscha*. The results indicate that over one-half of Kuskokwim River drainage area Chinook salmon harvests exceeded their respective 10-year averages. Many of the remaining Chinook salmon harvests were similar to each community's respective 10-year average, although all but one upper river community fell below their respective 10-year averages. For all but three surveyed communities, the 2022 chum salmon harvest was less than each community's 10-year average. For many communities, chum salmon harvests fell by more than 75% compared to each community's 10-year average, and four communities reported no harvest. Over 40% of surveyed communities' sockeye salmon harvests surpassed their respective 10-year average, whereas only 4 of the surveyed communities' coho salmon harvests were greater than their respective 10-year averages. Of the surveyed communities, 12 communities' Chinook salmon harvests exceeded each community's respective 5-year average, whereas 2 communities exceeded their 5-year average for chum salmon harvests. Lastly, over half of surveyed community sockeye salmon harvests exceeded their respective 5-year average, whereas over two thirds of surveyed community coho salmon harvests fell below each community's respective 5-year average.

Information from the Kuskokwim Management Area subsistence salmon monitoring program, including information recorded in 2022, are used by the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, Alaska Board of Fisheries, the Federal Subsistence Board, the North Pacific Fishery Management Council, the Kuskokwim River Salmon Management Working Group, the Kuskokwim River Intertribal Fish Commission, and numerous local organizations that advise these agencies in management of the fishery.

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

1. INTRODUCTION

Annual documentation of the subsistence salmon harvest is necessary to determine whether salmon are returning in sufficient numbers to a large portion of the Kuskokwim Management Area (KMA) rivers to meet escapement and subsistence needs. Since 1960, the Kuskokwim Area subsistence salmon monitoring program (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 Alaska Department of Fish and Game (ADF&G), U.S. Fish and Wildlife Service (USFWS), Alaska Board of Fisheries (BOF), and the Federal Subsistence Board (FSB) to manage and provide reasonable opportunity for continued customary and traditional uses of salmon throughout the area.

The purpose of this study was to quantitatively estimate the subsistence harvest of salmon, by species, among the majority of communities in the KMA using postseason subsistence salmon harvest surveys (Figure 1-1; Table 1-1). This study was a continuation of a project funded by the USFWS Office of Subsistence Management (OSM) Fisheries Resource Monitoring Program (FRMP) and the state of Alaska. Data about the number and species of salmon harvested by area residents were collected and analyzed to provide an estimate of the number of salmon harvested for subsistence purposes in 2022.

Project Goals

The goal of the survey is to provide a reliable, annual estimate of subsistence salmon harvest, primarily as a management tool for management agencies, advisory bodies, and local organizations. Survey questions are designed to determine total subsistence harvest of salmon. In addition to salmon harvested for human consumption, estimates include the number of salmon harvested to feed dogs, salmon discarded as unfit for human consumption, salmon given away by fishing households to others, and whether households were able to meet their subsistence needs. The data collected during this survey support 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. 2021).

Objectives

The objectives of this study were as follows:

1. Conduct subsistence salmon harvest surveys for the purpose of estimating the number of Chinook,[1] chum, sockeye, coho, and pink salmon harvested for subsistence uses by residents of Bethel;
2. Conduct subsistence salmon harvest surveys for the purpose of estimating the number of Chinook salmon, chum, sockeye, coho, and pink salmon harvested for subsistence uses by residents of Bethel and up to 27 other KMA communities, including communities on South Kuskokwim Bay;
3. Estimate subsistence salmon harvest by community; and
4. Estimate total subsistence salmon harvests in the surveyed portion of the KMA.

Study Area

The KMA includes the Kuskokwim River drainage, all waters of Alaska that flow into the Bering Sea between Cape Newenham and the Naskonat Peninsula, and Nunivak and St. Matthew islands (Figure 1-1).

1. Chinook salmon are also known as king salmon.

Figure 1-1.–Kuskokwim Management Area.

Table 1-1.–Kuskokwim Management Area communities and populations, by geographic location.

Community	Subsistence household surveys		US Census	ACS
	Estimated Population	Estimated Households	Estimated Population	Estimated Households
North Kuskokwim Bay				
Kipnuk[a]	–	–	704	114
Kwigillingok[a]	–	–	380	97
Kongiganak[a]	–	90	486	85
Lower Kuskokwim River				
Tuntutuliak	483	126	469	159
Eek	382	98	404	137
Kasigluk	599	109	623	75
Nunapitchuk	603	131	594	147
Atmautluak	299	69	386	30
Napakiak	419	111	358	147
Napaskiak	479	116	509	103
Oscarville	54	21	70	20
Bethel	6,032	1,795	6325	1,980
Kwethluk	856	182	812	84
Akiachak	652	177	677	104
Akiak	480	92	462	51
Tuluksak	518	105	444	61
Middle Kuskokwim River				
Lower Kalskag	391	96	278	59
Upper Kalskag	288	55	212	52
Aniak	455	162	507	160
Chuathbaluk	108	30	104	29
Upper Kuskokwim River				
Crooked Creek	100	37	90	20
Red Devil	11	7	22	2
Sleetmute	67	34	95	25
Stony River	25	14	57	6
Lime Village[b]	–	5	13	5
McGrath	240	94	301	89
Takotna	54	24	56	11
Nikolai	71	31	89	61
Telida[c]		–	2	2
South Kuskokwim Bay				
Quinhagak	803	195	776	210
Goodnews Bay	215	83	258	24
Platinum	62	18	55	3

-continued-

Table 1-1.–Page 2 of 2.

Community	Subsistence household surveys		US Census	ACS
	Estimated Population	Estimated Households	Estimated Population	Estimated Households
Bering Sea Coast				
Mekoryuk[d]	–	–	206	108
Newtok[d]	–	–	209	49
Nightmute[d]	–	–	306	29
Toksook Bay[d]	–	–	658	177
Tununak[d]	–	–	411	52
Chefornak[d]	–	–	506	67
Total	**14,747**	**4,107**	**18,914**	**4,634**

Source ADF&G Division of Subsistence household surveys, 2022, U.S. Census 2020 (population), and ACS 5-year estimates 2022 (households)

a. North Kuskokwim Bay communities have declined to participate in this study, and are not included in survey efforts.

b. Lime Village could not be reached for surveys.

c. Telida is only seasonally occupied and is not typically a part of this study.

d. Bering Sea coastal communities within the Kuskokwim Management Area are not included in the postseason survey.

There are 38 communities consisting of approximately 4,600 households within the KMA.[2] Of those households, more than three-quarters are situated within the Kuskokwim River drainage. Much of the subsistence salmon fishing effort occurs within the mainstem Kuskokwim River (McDevitt et al. 2020). Therefore, the bulk of survey effort was focused on communities located along the mainstem Kuskokwim River. In addition, Kuskokwim Area residents subsistence fish in many of the Kuskokwim River tributaries that contain salmon (Figure 1-1; Tiernan et al. 2018:1). Residents of Quinhagak, Goodnews Bay, and Platinum, which are located along the south shore of Kuskokwim Bay, harvest salmon stocks primarily from the Kanektok, Arolik, and Goodnews river systems. Residents of Kipnuk, Kwigillingok, and Kongiganak, which are located on north Kuskokwim Bay, harvest salmon from within the Kuskokwim River drainage and from local drainages that empty into Kuskokwim Bay. Residents of Toksook Bay, Nightmute, Tununak, Newtok, Chefornak, and Mekoryuk, which are situated on the Bering Sea coast, harvest salmon from coastal waters or salmon bound for nearby rivers.

Residents of the Kuskokwim River drainage identify the region's communities as being divided among three distinct areas that are commonly referred to as the lower, middle, and upper river. The lower Kuskokwim River includes the communities of Eek and Tuntutuliak and extends upstream approximately 125 river miles to the community of Tuluksak. From there, the area locally known as the middle Kuskokwim River extends roughly 260 miles upstream and includes all communities from Lower Kalskag to Stony River (including Lime Village on the Stony River). The portion referred to as the upper Kuskokwim River begins near the community of Stony River upstream to the community of Nikolai, a distance of approximately 233 miles. This report will use the regional distinctions employed by the ADF&G Division of Commercial Fisheries (DCF). The local and DCF regional distinctions for the lower Kuskokwim River are identical. However, the DCF regional distinctions for the middle and upper portions of the river differ from the locally known regional distinctions. The DCF boundaries used in this report designate the middle Kuskokwim River to include all communities from Lower Kalskag upstream to Chuathbaluk and the upper Kuskokwim River to include all communities from Crooked Creek upstream to Nikolai.

The Kuskokwim River 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 (McDevitt et al. 2021b). Residents harvest five species of Pacific salmon (hereinafter *salmon*) for subsistence purposes: Chinook *Oncorhynchus tshawytscha*, chum *O. keta*, sockeye *O. nerka,* coho *O. kisutch*, and pink salmon *O. gorbuscha*. Between 2010 and 2014, the ADF&G Division of Subsistence conducted comprehensive subsistence harvest and use surveys in 23 KMA communities. The results indicate that on average salmon contribute 40% of the total subsistence resource harvest (in edible pounds) in the lower Kuskokwim River communities, 65% in the middle Kuskokwim River communities, and 25% in the upper Kuskokwim River communities (Brown et al. 2012; 2013; Ikuta et al. 2014; 2016; Runfola et al. 2017).

Salmon Stock Run Timing[3]

Chinook salmon are the first to arrive in the lower Kuskokwim River following breakup, which typically occurs in late spring. Chinook salmon are most abundant in the lower Kuskokwim River between mid- to late June. On average, the majority of Chinook salmon have passed through the lower Kuskokwim River by early to mid-July.[4] In the middle Kuskokwim River, Chinook salmon begin to arrive in smaller numbers approximately two to three weeks after they begin to pass through the Bethel area. The highest abundance of Chinook salmon in the middle Kuskokwim River generally occurs in late June and early July, and the run begins to decline during the second to third week of July. In the upper Kuskokwim River, small numbers

2. U.S. Census Bureau, Washington D.C., n.d. "Explore Census Data." Accessed December 1, 2022. https://data.census.gov/cedsci/
3. All run timing information is based upon discussions with local Kuskokwim River subsistence fishers, C. McDevitt, field notes, July 2019, May 2022.
4. Sean Larson, Division of Commercial Fisheries, ADF&G, Anchorage, personal communication, email correspondence, November 27, 2023.

of Chinook salmon are present in mid-June; the run strengthens towards the end of June and into early July then begins to diminish in mid-July.[5]

Both sockeye and chum salmon enter the lower Kuskokwim River by early to mid-June and run concurrently with Chinook salmon. Both runs begin to strengthen in late June along with Chinook salmon. However, the sockeye salmon run declines in mid-July, while the chum salmon run diminishes at the end of July because of their slower swimming speeds. Sockeye salmon begin to arrive in the middle Kuskokwim River approximately one week after they begin to pass through the Bethel area and peak around the second week of July. Chum salmon typically appear in the middle Kuskokwim River in smaller numbers roughly one week after sockeye salmon arrive in the area; the chum salmon run continues to strengthen following the peak of the sockeye salmon run. Chum salmon enter the upper Kuskokwim River in mid-July and peak towards the end of the month. Sockeye salmon migrate only as far upriver as the Stony, Swift, and Tatlawiksuk river drainages, a distance of over 300 river miles from the Kuskokwim River mouth. This species is generally not present in the Kuskokwim River drainage upstream of these tributaries, unlike chum and Chinook salmon, which migrate to the headwaters.[6]

Coho salmon are the last to enter the river and pass through the lower Kuskokwim River beginning in mid- to late July and can be found in the middle and upper Kuskokwim River in late July to early August. The coho salmon run peaks during early August in the lower Kuskokwim River and during the second and third weeks of August in the middle and upper Kuskokwim River. The coho salmon run continues through August and declines during the latter part of the month and into early September, although harvests may occur into October. Coho salmon also migrate the length of the Kuskokwim River.

Typically, salmon that are bound for tributaries in the headwaters of the Kuskokwim River drainage begin their migration earlier in the season. In addition, these fish generally travel at faster migration rates compared to other Chinook salmon, chum salmon, and coho salmon that are bound for less distant tributaries, such as those located in the lower and middle Kuskokwim River (Clark and Smith 2019; Pawluk et al. 2006; Smith and Liller 2017a; 2017b) Also, Chinook, chum, and coho salmon that begin their migration later in the season tend to travel faster than other salmon that begin their migration earlier in the season, notwithstanding the distance needed to travel (Schaberg et al. 2010). Prior assessment projects have determined that Chinook salmon generally travel between 27 to 36 miles per day as they migrate upstream to their respective spawning areas (Clark and Smith 2019). A mark-recapture study conducted by DCF staff in 2004 documented travel speeds for chum, sockeye, and coho salmon (Pawluk et al. 2006). These travel speeds were based upon the distance between several different sampling sites as fish were tagged at one site and recaptured at a site further upstream. The majority of sockeye salmon recaptured during the study generally traveled a distance of 35 miles in one 24-hour period. Chum salmon that were tagged and recaptured typically traveled 35 miles in two days, and coho salmon traveled the same distance in approximately five days.

Salmon Harvesting

Salmon harvests typically occur June through October throughout the drainage. Each summer, many families relocate to, or make frequent short trips to, seasonal fish camps situated along tributaries, sloughs, and the mainstem Kuskokwim River. Fish camps are bases for fishing excursions as well as centralized harvest processing sites. Although these seasonal movements continue today for some families, Godduhn et al (2020) notes that fewer families are using fish camps in comparison to earlier years (Godduhn et al. 2020: 3). Many respondents attribute the decline in the use of fish camps to increased restrictions on fishing opportunity and an associated increase in fishing costs. Conducting harvest and processing activities from fish camps is less feasible now for some families because of the unpredictable nature of the fishing schedule and the increasingly high costs of gasoline, oil, gear, and other necessary items. For example, according to

5. Sean Larson, Division of Commercial Fisheries, ADF&G, Anchorage, personal communication, email correspondence, November 27, 2023.
6. Sean Larson, Division of Commercial Fisheries, ADF&G, Anchorage, personal communication, email correspondence, November 27, 2023.

one lower Kuskokwim River fisher, "It used to be worth going [to] fish camp, long ago, but we're beginning to wonder whether it's worth it or not [nowadays]" due to fishing restrictions (Godduhn et al. 2020:42).

Many respondents throughout the drainage explained that basing their fishing and processing from their home communities tended to be more cost-effective and more aligned with conservation-based management initiatives. For example, a middle Kuskokwim River fisher explained "Now we built a smokehouse behind our house. So, we just cut the fish under the bank and then haul them up to dry 'em" (Godduhn et al. 2020:58–59).

One middle Kuskokwim River fisher said that fewer fishing opportunities caused an increase in the amount of work involved as well as a disruption of social networks and the transmission of knowledge to younger generations:

> When I was younger, we would all go to fish camp, and we would just be there…when we weren't regulated on what we were doing. It was, you didn't have to cut 200 fish a day and make it be extreme work. You could cut 30 fish, the first day you get to fish camp, 20 fish, 10 fish, 50 fish. It wasn't a mad dash to get it done on your opening and make it not be a family gathering. Now it gets to be where you need to be there on time. And there is not a lot of time to stop and teach the younger ones because you gotta get all of that done and then in the smokehouse. I still, like mom taught me, teach my girl to cut the way mom has taught me to cut. But I can't spend time [teaching my daughter], like mom used to spend with me. (Godduhn et al. 2020:59)

Although thousands of residents throughout the drainage harvest salmon each season, several factors differentiate one region of the river to the next. These include differences in the physical nature of the river through its course, species distribution and abundance, types of gear used by fishers, and population size between communities.

Overall, annual subsistence salmon harvests are roughly proportional to population size among the different regions of the drainage. For example, approximately 80% of the Kuskokwim River drainage population resided in lower river communities in 2022 (Table 1-2), and from 1990 to 2022, lower river fishers harvested 78% of the total subsistence salmon harvest (Appendix A). The community of Bethel, which accounts for nearly half of the Kuskokwim River drainage population, harvested just over 30% of the total subsistence salmon harvest in 2022. Roughly 8% of the population resided in middle Kuskokwim River communities in 2022, and middle Kuskokwim River harvests accounted for approximately 10% of the total annual harvest from 1990 to 2022. Upper Kuskokwim River communities accounted for 4% of the total drainage population in 2022, and between 1990 and 2022 upper Kuskokwim River fishers harvested approximately 7% of the total annual harvest. Lastly, south Kuskokwim Bay communities accounted for approximately 7% of the surveyed area population in 2022. Between 1990 and 2022, South Kuskokwim Bay harvests accounted for 5% of the total harvest for all salmon.

Due to their physical location within the drainage, lower Kuskokwim River communities are positioned to harvest each of the four major species of returning salmon as soon as they enter the river.[7] Salmon population density tends to be greater, and the fish are typically in better physical condition within this portion of the drainage early in the run. Further upstream, both the physical quality of fish and abundance change. According to one middle Kuskokwim River fisher, some chum salmon that first arrive in the Aniak area in June are in good physical condition and are typically harvested by fishers. However, the fisher added that the quality of chum salmon deteriorates quickly as the season progresses (Godduhn et al. 2020). Similarly, according to one fisher from Sleetmute, early arriving chum salmon are typically in good condition, but subsequent chum salmon "…get rotten too much going up to fresh water, you know. So I let them…go" (Godduhn et al. 2020:62).

7. Although Kuskokwim River drainage fishers do harvest pink salmon, the annual harvest is generally far lower than harvests of Chinook, chum, sockeye, and coho salmon.

Table 1-2.–Total households, surveyed households, and estimated population, surveyed communities, Kuskokwim Management Area, 2022.

Community	Total households	Surveyed households	Estimated population	CI (95%)
Kongiganak	90	–	–	–
North Kuskokwim Bay	**90**	–	–	–
Tuntutuliak	126	39	483	98
Eek	98	29	382	59
Kasigluk	109	48	599	70
Nunapitchuk	131	54	603	81
Atmautluak[a]	69	21	299	82
Napakiak	111	27	419	86
Napaskiak	116	32	479	80
Oscarville[a]	21	11	54	15
Bethel	1,795	369	6,032	312
Kwethluk	182	74	856	89
Akiachak[a]	177	35	652	248
Akiak[a]	92	24	480	89
Tuluksak	105	46	518	69
Lower Kuskokwim River	**3,132**	**809**	**11,857**	**430**
Lower Kalskag	96	22	391	107
Upper Kalskag	55	16	288	54
Aniak	162	40	455	95
Chuathbaluk	30	20	108	19
Middle Kuskokwim River	**343**	**98**	**1,243**	**143**
Crooked Creek	37	25	100	12
Red Devil[a]	7	4	11	4
Sleetmute[a]	34	14	67	14
Stony River[a]	14	4	25	26
Lime Village	5	-	-	-
McGrath	94	32	240	40
Takotna	24	5	54	16
Nikolai	31	21	71	13
Upper Kuskokwim River	**246**	**105**	**567**	**47**
Kuskokwim River Total[b]	**3,721**	**1,012**	**13,667**	**454**
Quinhagak	195	76	803	101
Goodnews Bay[a]	83	16	215	62
Platinum[a]	18	10	62	6

-continued-

Table 1-2.–Page 2 of 2.

Community	Total households	Surveyed households	Estimated population	CI (95%)
South Kuskokwim Bay	**296**	**102**	**1,080**	**113**
Kuskokwim Area Total	**4,107**	**1,114**	**14,747**	**467**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are not available; see Table 1-1 for community-specific details.

a. No estimate of population was derived for use groups for which no households were surveyed.

b. Kuskokwim River Total includes lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Generally, salmon species are less abundant in the upper Kuskokwim River than further downstream within the drainage. In addition, the quality of salmon in the upper portion of the drainage is generally less desirable. One upper Kuskokwim River fisher described the difference in quality:

> To eat fish strips from fish caught in McGrath or between McGrath and Nikolai, compared with fish strips from anywhere else in the state, it's amazing. It's a piece of dry beef jerky with zero oil to it. And they are light colored instead of that nice orange color that fish strips from everywhere else have. (Ikuta et al. 2014:36)

Upper Kuskokwim River fishers do harvest some chum salmon, although some residents consider the quality of chum salmon in this region of the drainage to be less than desirable (Godduhn et al. 2020:86). Fishers in this area primarily target Chinook and coho salmon. Sockeye salmon are not prevalent in the upper reaches of the drainage. As noted earlier, the upper extent of sockeye salmon distribution in the Kuskokwim River is roughly as far upstream as the Stony and Swift river drainages, 133 and 233 river miles downstream from the communities of McGrath and Nikolai, respectively.[8] According to one upper Kuskokwim River fisher:

> Well, we don't get any reds [sockeye salmon]…they [some upper river residents] drift down there, go down to the Tatlawiksuk or go down Stony River and setnet for a while or fish with somebody down there. That's where all of this [sockeye] harvest is coming from is downstream. (Godduhn et al. 2020:86)

Despite the distance, and as is indicated above, some upper Kuskokwim River fishers travel to the middle Kuskokwim River area to harvest salmon. Although these trips provide additional opportunities for upper Kuskokwim River families to harvest certain salmon species that are not locally accessible, the distance traveled costs a great deal of time and fuel: "Price of gas is crazy. It costs a fortune just to go down to [fish]. It's crazy. It's $7.59 a gallon" (Godduhn et al. 2020:87). Due to the high costs and long distances, some upper Kuskokwim River families combine their resources to make these downriver trips less expensive.

Throughout the drainage, the most common gear types for harvesting salmon include drift gillnets, set gillnets, fish wheels, and rod and reel. Although both set and drift gillnets are used drainagewide, disparate physical characteristics between the three regions of the river typically demand different gear types in each region. For example, the lower Kuskokwim River's large width and depth coupled with less net-snagging debris in the river is generally conducive to the use of large drift and set gillnets: drift gillnets may be up to 300 feet long and over 22 feet deep. Middle Kuskokwim River fishers also utilize drift and set gillnets in the swifter, narrower middle Kuskokwim River, but these nets are typically shorter in length and shallower

8. Google Earth Pro 7.3.4.8642. "Stony River, Alaska." 61°49'34.92" N and 156°22'05.99" W. CNES/Airbus, Maxar Technologies, Landsat/Copernicus. 2022. Accessed July 19, 2022.

in depth than those used in the lower Kuskokwim River. For example, one middle Kuskokwim River fisher described why he preferred using a set gillnet as opposed to a drift gillnet:

> You don't know if you are gonna catch a snag on those drifts, on the bottom. And you get stuck and you will have a hell of a goddamn time to get it out…You gotta jerk it out sometimes with the motor. Tear your net and you have to fix the net again. Boy, that is bad. Lot of logs here [in the middle Kuskokwim River], you know. (Godduhn et al. 2020:64)

Middle Kuskokwim River fishers also deploy fish wheels, use rod and reel gear, and to a lesser degree dip nets. One middle Kuskokwim River fisher described the tradition as well as the importance of fish wheels for his community:

> What I can remember that's how we always fished pretty much, fish wheels. That was our way of life. A lot of people like I said even back then we couldn't afford fish nets. So we used what nature provided: wood. And that's how we made our fish wheels. That's how my dad's dad and my dad did it. My dad's dad had a fish wheel. And that's where I learned it. (Godduhn et al. 2020:69)

Rod and reel fishing in the middle Kuskokwim River is especially popular when coho salmon are running. According to one Aniak respondent, "Silvers are…so many, you just rod and reel, you can get quite a bit" (Godduhn et al. 2020).

Upper Kuskokwim River fishers deploy shorter, shallower gillnets and also depend on fish wheels and rod and reel gear; some upper Kuskokwim River families exclusively use rod and reel gear to harvest both Chinook and coho salmon.

Regulatory Context

The regulation of hunting and fishing for subsistence practices has a unique history in Alaska. Both state and federal laws provide priorities for customary and traditional subsistence hunting and fishing over other consumptive uses, such as commercial fishing. The BOF and the Alaska Board of Game adopt subsistence regulations and make allocations of fish and game resources for use by Alaska residents on state-owned and private lands as determined under AS 16.05.258. Subsistence Use and Allocation of Fish and Game. Fishing and hunting regulations have been further refined by court rulings as well as by state statutes authorizing the BOF activities. In State of Alaska regulation, all Alaskans are eligible to participate in state subsistence programs following 12 months of Alaska residency.

Following the passage of Alaska National Interest Lands Conservation Act (ANILCA) in 1980 and the 1989 McDowell decision by the Alaska Supreme Court[9], the federal government established the federal subsistence program. This program provides subsistence opportunity for qualified rural residents on applicable federal public lands and waters and establishes customary and traditional use determinations under 50 CFR §100.24. In contrast to the state of Alaska's definition of a subsistence user as all state residents, a federally qualified user must be Kuskokwim Area resident to participate in the Kuskokwim River federal subsistence salmon fishery (50 CFR § 100.5).

Regulatory authority for Kuskokwim River salmon management is shared by the Federal Subsistence Board (FSB) and the BOF. In the Kuskokwim River, the ADF&G is responsible for implementing regulations in accordance with the Kuskokwim River Salmon Management Plan (Management Plan; 5 AAC 07.365). It also has inseason discretionary management authority of salmon in all Alaska navigable waters.

In 1988, the BOF formed the Kuskokwim River Salmon Management Working Group (Working Group) in response to requests from subsistence fishers in the KMA who sought a more active role in the management of salmon fishery resources (Bailey and Shelden 2014:1; Smith and Linderman Jr. 2008:1). The Working Group is composed of knowledgeable stakeholder representatives as well as ADF&G biologists and other staff. It acts in a representative fashion for communities throughout the Kuskokwim River drainage and met

9. McDowell v. State of Alaska. Alaska Supreme Court Files S-2732. 785 P.2d 1 (1989)

11 times in 2022, from early May to mid-August.[10] The majority of subsistence salmon fishers in the region are local residents; however, some subsistence fishers are domiciled in other parts of Alaska and return to assist family or friends with the harvesting or processing of salmon (Simon et al. 2007a:5).

The portion of the Kuskokwim River drainage from the Aniak River downstream to Kuskokwim Bay is within the boundaries of the Yukon Delta National Wildlife Refuge (YDNWR). As such, the U.S. Fish and Wildlife Service shares inseason subsistence fishing management decision-making with ADF&G in this part of the Kuskokwim River. Federal subsistence schedules, openings, closings, and fishing methods are generally the same as those for state subsistence salmon fisheries, unless superseded by federal special action (50 CFR § 100.27). The USFWS holds final decision-making authority over management of salmon in these waters if the federal subsistence program determines that subsistence uses by non-federally qualified users must be eliminated in order to meet the federal subsistence priority. Specifically, this means that state residents who live outside of the Kuskokwim River drainage would not be eligible to participate in the fishery in the lower river.

The Kuskokwim Inter-Tribal Fisheries Commission (Fish Commission) was established in 2015 as a demonstration project through memorandum of understanding between the USFWS and Kuskokwim Area Tribes. The Fish Commission is a group of Kuskokwim River tribal representatives who consult with both state and federal agencies. They also advise USFWS management staff on co-management decisions regarding subsistence salmon fishing in the Kuskokwim River drainage within the boundaries of the YDNWR (Runfola et al. 2018).

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

Alaska Statute 16.05.258, "Subsistence use and allocation of fish and game," establishes the subsistence use priority (above sport, commercial, and personal use) when resources are not abundant enough to provide for all consumptive uses and while remaining in accordance with principles of sustained yield. Subsistence uses protected by the subsistence priority are those practices identified as customary and traditional practices as determined by the BOF (16.05.258 and 5 AAC 99.010). In 1993, the BOF made positive findings for customary and traditional uses of all salmon species in the entire KMA. As part of these findings, the BOF then determined the amount reasonably necessary for subsistence (ANS) in these respective areas as one means to provide reasonable opportunities for success in harvesting salmon for subsistence uses. Based on historical harvest information, an ANS of 192,000–242,000 for salmon of all species in the Kuskokwim Area was determined (5 AAC 01.286). In 2001, the BOF amended this ANS range for the Kuskokwim River using subsistence harvest data from the years 1990 to 1999. After reviewing various options, the BOF made new customary and traditional use and ANS findings for the Kuskokwim area by species.

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

67,200–109,800	Chinook [king] salmon in the Kuskokwim River drainage;
41,200–116,400	chum salmon in the Kuskokwim River drainage;
32,200–58,700	sockeye salmon in the Kuskokwim River drainage;
27,400–57,600	coho salmon in the Kuskokwim River drainage;

10. ADF&G, n.d. "Commercial Salmon Fisheries, Kuskokwim Management Area: Kuskokwim River Salmon Management Working Group." Accessed July 17, 2023. https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareakuskokwim.kswg

500–2,000	pink salmon in the Kuskokwim River drainage;
6,900–17,000	salmon in Districts 4 and 5 combined; and
12,500–14,400	salmon in the remainder of the KMA

Also in 2013, the BOF updated and clarified the Kuskokwim River Salmon Management Plan (5 AAC 07.365). The new plan provides guidelines for managing the Kuskokwim River salmon fisheries to meet escapement goals and the subsistence priority; goals for KMA and other Arctic–Yukon–Kuskokwim (AYK) salmon stocks were reevaluated in 2015 (Conitz et al. 2015). During times when the amount of fish available for subsistence harvest is limited, the ADF&G Commissioner may open a fishing period during which Chinook salmon may only be taken by persons 60 years of age or older; however, this system has not been implemented since 2015 (Poetter and Tiernan 2017).

Subsistence harvest of salmon species in the Kuskokwim River is allowed without a permit (5 AAC 01.280) and with generally no closed seasons (5 AAC 01.260), except as specified in the management plan or otherwise ordered for conservation purposes, as has been the case in recent years. As described earlier in this report, Kuskokwim River fishers have experienced severe declines in Chinook salmon run sizes and subsistence Chinook salmon harvests since at least 2010. Decreasing Chinook salmon abundance has resulted in several years of the most restrictive management actions in the history of the Kuskokwim River salmon fishery (Runfola et al. 2018). Fishery management advisory groups such as the Kuskokwim River Salmon Management Working Group and the Kuskokwim River Inter-Tribal Fish Commission as well as members of the public have consistently expressed concern regarding the need for additional opportunities to harvest some Chinook salmon. In response to declines in Chinook salmon abundance, severe fishing restrictions, and widespread public concern, Kuskokwim River fishers collaborated with ADF&G through the BOF regulatory process to develop options for increased Chinook salmon fishing opportunities in times of conservation.

At the BOF's Statewide King and Tanner Crab and Supplemental Issues Meeting in March 2017, the board carried Proposal 276, which included placing in regulation a Kuskokwim River household subsistence Chinook salmon permit open to all Alaska residents and valid within State of Alaska waters upriver from the Aniak River mouth (Alaska Department of Fish and Game 2017). Proposal 276 provided fishers with additional opportunities to fish during times of Chinook salmon conservation and allow for the harvest of 10 Chinook salmon during fishing closures when in possession of a household Chinook salmon permit. Public support of a permit system was mixed: many individuals and advisory committees expressed opposition; however, the BOF recognized the potential benefit to middle and upper Kuskokwim River fishers who testified about a need for greater fishing opportunity and a more equitable distribution of the subsistence Chinook salmon harvest. The permit was voluntary, and its usage was confined to state waters upstream of the Yukon Delta National Wildlife Refuge boundary at Aniak.[11] Permit holders could continue to fish during salmon fishery closures, if they abided by the following permit stipulations:

- Only one permit may be issued per household.
- Annual permit harvest limit is 10 Chinook salmon.
- All other fish caught while fishing with the permit may be retained.
- Permit must be on the fisher while fishing.
- Gillnets must be 6-inch or less mesh, not to exceed 25 fathoms in length, and 45 meshes depth.
- Chinook salmon may also be harvested with hook and line, dipnets, fish wheels, and beach seines.

11. For more information, see Runfola et al. (2018).

- All Chinook salmon harvested by any gear type count toward the household's annual permit limit.
- The Aniak box, which includes waters of the Kuskokwim River from the Yukon Delta NWR boundary at Aniak, was to remain closed to gillnets with or without the subsistence permit.

Although adopted by the BOF, implementation of the permit was left to ADF&G's discretionary authority. When the BOF adopted the Chinook salmon permit on the Kuskokwim River, they chose to establish a sunset clause with the intention of revisiting the efficacy of the program over a four-year period (Runfola et al. 2018).[12] Additionally, the board requested that the Division of Subsistence oversee the permit system. Subsistence Division staff developed a permit document and informational materials and distributed them to vendors in middle and upper Kuskokwim River communities from Lower Kalskag and upriver to Nikolai. Through consultation with Division of Commercial Fisheries, management staff, ADF&G decided to move forward with permit administration for the first time during the 2018 fishing season.

On June 12, 2018, subsistence Chinook salmon household permit fishing was opened by a department emergency order (Alaska Department of Fish and Game, Division of Commercial Fisheries 2018a) for state waters of the Kuskokwim River drainage above the boundary of the Yukon Delta National Wildlife Refuge. Fishing with the household permit was closed by emergency order effective June 26, 2018 (Alaska Department of Fish and Game, Division of Commercial Fisheries 2018b). Approximately 332 permits were distributed to vendors from the Kuskokwim River from the middle river community of Upper Kalskag to the upper Kuskokwim community of Takotna. In total in 2018, 52 Chinook salmon permits were returned to ADF&G recording a total of 200 Chinook salmon harvested by fishers using the household permit (Runfola et al. 2018:14), demonstrating limited participation in the permit system. The Chinook Salmon permit was not used in the 2019 or 2020 salmon seasons, due to a historically low harvest of Chinook salmon in the ADF&G regulatory area above Aniak (<10 Chinook/household).[13]

In 2019 at the Statewide Finfish and Supplemental Issues BOF meeting, the Division of Subsistence provided a report to the BOF regarding the resulting data and program efficacy. This report concluded that due to the small number of issued permits that had been returned to the department, the Kuskokwim Area demonstrated limited participation in the permit system and a minimal harvest of Chinook salmon under the permitting system. The Division of Subsistence planned to continue administering the Kuskokwim River household subsistence Chinook salmon permits when implement through EO by the Division of Commercial Fishers through the end of the 2021 sunset clause. At that point, the division of Subsistence would provide a complete review of permit use and effectiveness.

Household permits for subsistence Chinook salmon were implemented by EO once more in the summer of 2021. However, similar to the summer of 2018 only a small number of household permits were issued and returned to ADF&G. In the 2021 fishing season, a total of 475 permits were distributed to middle and upper Kuskokwim River community vendors from Lower Kalskag to Nikolai. In addition, 150 permits were made available at the Bethel ADF&G office and 50 were made available at the Anchorage ADF&G office. The total number of permits issued was 128. The harvest data collected through returned permits was insufficient for analysis (McDevitt et al. 2021b).

Following the 2021 season the Division of Commercial Fisheries (DFC) reviewed the effectiveness of the permit system and determined that the permit system was redundant to the regulations already in place. For example, on June 12, 2021, subsistence fishing with the subsistence Chinook salmon permit was implemented in Subsistence Sections 4 and 5 (YDNWR boundary at Aniak upstream to the headwaters

12. Due to the COVID-19 pandemic, the BOF postponed the 2022 Arctic-Yukon-Kuskokwim (AYK) meeting to 2023. As a result, ADF&G submitted an agenda change request (ACR) to the BOF to extend the sunset date to December 31, 2022. The BOF accepted the request and extended the sunset date at its November 2021 Prince William Sound meeting.
13. N. Smith, ADF&G, Kuskokwim, Commercial Fisheries Area Management Biologist, personal communication, December 15, 2023

of the Kuskokwim River). However, on June 16 and June 19, receptively, Sections 5 and 4 (together encompassing the Kuskokwim River from Aniak to the headwaters) were opened to subsistence fishing to all Alaska residents, making the household permits redundant and ultimately ineffective due to minimal local use (Smith and Gray 2022).[14] Additionally, permit data did not record a household's harvest of all salmon species, which the annual postseason household survey estimates each fall—including harvests made while fishing under the permit system.

Ultimately, the Kuskokwim Chinook permit system was designed to provide fishers with opportunities to harvest a small number of Chinook and other salmon within state waters of the Kuskokwim River drainage during times of Chinook salmon conservation. However, the low use rate, the redundancy in regulations and harvest reporting, and the continued low returns of Chinook salmon reduced the utility of this permits to ADF&G and Kuskokwim River fishers. After the 2021 fishing season, the sunset clause established by the BOF effectively ended the program. Without additional regulatory action, ADF&G will no longer be able to issue a Kuskokwim Chinook salmon permit.

Alaska regulations allow a variety of gear types to be used in the Kuskokwim River for subsistence salmon fishing and include specifications regarding the use of gillnets (5 AAC 01.270). There are no federal or state bag or possession limits for subsistence salmon harvests in the Kuskokwim River, except from June 1 through August 31, when subsistence fishing with a hook and line attached to a rod or pole in that portion of the Aniak River drainage upstream of Doestock Creek, the bag and possession limit is two Chinook salmon, and rainbow trout *O. mykiss* may not be retained (5 AAC 01.295). Federal regulations of all subsistence fish harvests on Alaska federal public lands and waterways are administered under 50 CFR §100.27, including seasons, gear types, and bag and possession limits on all salmon and nonsalmon species.

Until the recent sharp decline in Chinook salmon beginning in 2012, the subsistence salmon fishing season in the surveyed portion of the KMA was generally open unless a subsistence fishing schedule closure was implemented by emergency order prior to, during, and after commercial fishing periods. In addition, closures to the fishery were implemented by emergency order for conservation purposes (see 5 AAC 01.260 and 5 AAC 07.365). In the Kuskokwim River, a subsistence fishing schedule with periodic fishing closures (openings between these closures were often referred to as "windows" or "openers") was implemented from 2001–2006. In recent years, an early season closure has closed all salmon fishing prior to June 12. Subsequently, a fishing schedule is implemented which includes timed openings during the Chinook salmon run: this limits fishing opportunities for Chinook salmon as well as other species. Fishing regulations and restrictions specific to the 2022 season will be discussed further in the following section.

The 2022 Season

Forecast

In the spring of 2022, ADF&G managers forecasted the Chinook salmon return to include a range of 99,000–161,000 fish.[15] This estimate fell within the drainage-wide escapement goal of 65,000–120,000 and was slightly higher than the 2021 forecast range of 94,000–155,000.[16] The preseason forecast range is equal to ±25% of the prior season total run amount. Uncertainty in the forecast is based on the 7-year average percent error between the forecasted run estimate and the actual run estimate. The preseason forecast is

14. N. Smith, ADF&G, Kuskokwim, Commercial Fisheries Area Management Biologist, personal communication, December 15, 2023
15. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kuskokwim River Subsistence Fishery, May 13, 2022, Accessed on January 8, 2024. https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1371303885.pdf
16. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kuskokwim River Subsistence Fishery, November 4, 2021, Accessed on January 8, 2024. https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1345527186.pdf

typically produced during the spring after managers receive and analyze harvest information collected through use of the postseason survey (Larson 2021).[17]

Escapement

Escapement goals of salmon species are critical to fisheries management and influence the regulatory opening schedules determined by managers at the beginning of the fishing season. Managers aim to balance the conservation concerns of salmon stocks with the needs of user groups within the KMA. For this reason, the escapement goals of salmon species within the KMA have been included in this report. The ADF&G Division of Commercial Fisheries, the USFWS, and Kuskokwim River drainage area tribal organizations conducted various inseason assessment projects at several different sites throughout the Kuskokwim River drainage in 2022. The two primary assessment projects used by ADF&G to facilitate inseason management decisions were the Bethel Test Fishery (BTF), which was in operation from June 1 to August 24, and the Kuskokwim River sonar project, which was conducted from June 2 to August 26. Data collected through the BTF were used to inform managers about run timing and salmon species catch-per-unit-effort (CPUE; see Molyneaux 1997); the Kuskokwim River sonar project provided managers with passage estimates for salmon as well as nonsalmon species (Smith and Gray 2021). In addition to the aforementioned assessment projects, weirs were in operation in six major salmon-spawning tributaries: the George, Salmon (Aniak River tributary), Kogrukluk, Telaquana, Takotna, and Pitka Fork (Salmon River) rivers. Aerial surveys were not conducted in the Kuskokwim River drainage in 2022 due to poor weather and lack of pilot availability. Aerial surveys are primarily utilized for Chinook and sockeye salmon assessment, because both chum and coho salmon are typically less visible by this method (Tiernan et al. 2018).

The 2022 Kuskokwim River Chinook salmon run timing was considered two days later than average based on BTF data.[18] The drainagewide run for Chinook salmon in 2022 was estimated to be 143,622 fish (95% confidence interval [CI]: 106,565–193,565); the drainagewide Chinook salmon escapement estimate included 105,774 fish (95% CI: 68,717–155,717). The 2022 Chinook salmon escapement fell within the drainagewide escapement goal of 65,000–120,000 fish. Chum salmon run timing was 11 days later than average.[19] The cumulative chum salmon passage estimate at the sonar was 103,455 fish (95% CI: 75,485–131,425). Chum salmon escapement at all weir projects was poor, and none of the escapement goals were met for chum salmon in 2022. Sockeye salmon run timing was close to average, and the run size included nearly 614,039 fish (95% CI: 557,213–670,865), according to data collected through the Bethel sonar project.[20] Sockeye salmon escapement was variable throughout the drainage with above average lake-type sockeye escapement and near average to slightly below average river-type sockeye salmon escapement. In addition, the Telaquana River weir observed the fourth highest escapement since operations began in 2010 with a count of 152,737 fish.[21]

17. For more information on how ADF&G develops salmon forecasts, see A. Carroll, 2006. "Salmon Forecasting in Alaska: Who Needs to Know?" Alaska Fish & Wildlife News. Accessed July 6, 2022. http://www.adfg.alaska.gov/index.cfm?adfg=wildlifenews.view_article&articles_id=193
18. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kuskokwim River Subsistence Fishery, October 24, 2022, Accessed on January 8, 2024. https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1442508330.pdf
19. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kuskokwim River Subsistence Fishery, October 24, 2022, Accessed on January 8, 2024. https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1442508330.pdf
20. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kuskokwim River Subsistence Fishery, October 24, 2022, Accessed on January 8, 2024. https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1442508330.pdf
21. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kuskokwim River Subsistence Fishery, October 24, 2022, Accessed on January 8, 2024. https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1442508330.pdf

Estimates regarding coho salmon run timing and run size were incomplete in 2022 because the coho salmon run was still progressing after the sonar and BTF projects ceased operations on August 24 and August 26, respectively.[22] However, the sonar operation estimated a cumulative run size of 161,257 fish (95% CI: 126,324–196,190). Coho salmon escapement on the George River was only 9,934 coho salmon, which was the fifth lowest since 1997. The preliminary escapement estimate of 6,291 coho salmon at the Kwethluk River weir did not meet the established lower bound sustainable escapement goal (SEG) > 19,000 fish, and the Kogrukluk River weir escapement was incomplete in 2022 due to high water and, therefore, the escapement goal was not evaluated.

Management Actions

Similar to escapement goals, management actions directly impact the total harvest of salmon species by households throughout the KMA. Management actions such as regulatory opening schedules determined by managers at the beginning of the fishing season, as well as closures, emergency orders, gear restrictions, and liberalizations, all combine to influence the total harvest of salmon by subsistence fishers. For this reason, the following summary of management actions of the 2022 season have been included in this report. The early season salmon closure began on June 1, 2022 from the Yukon Delta National Wildlife Refuge (YDNWR) boundary at the mouth of the Kuskokwim River upstream to the YDNWR boundary at Aniak and upstream of the Yukon Delta Refuge boundary at Aniak beginning June 9, 2022.[23] Additional restrictions during this time included tributary closures as well as live release requirements for Chinook salmon captured in selective gears. During the early season closure, ADF&G held three 16-hour, 6-inch set gillnet opportunities on June 1, 4, and 8. The Federal Fisheries Manager issued a Special Action[24] to close the Kuskokwim River Chinook salmon fishery to non-federally qualified users within the boundary of the YDNWR June 1 through July 21. During this time, USFWS offered 6-inch set gillnet opportunities running concurrently to the 6-inch opportunities offered by the department on June 1, 4, and 8. Additionally, USFWS provided four 12-hour gillnet fishing periods on June 12, 16, 22 and July 9 with 6-inch or less mesh, 25 fathoms in length above the Johnson River mouth and 50 fathoms in length below the Johnson River mouth. USFWS offered two 36-hour set gillnet fishing periods on June 29 and July 3 and two 16-hour set gillnet fishing periods on July 10 and 16. On June 20, USFWS opened those waters between the Kalskag Bluffs to the YDNWR boundary at Aniak to subsistence fishing until further notice with 6-inch or less mesh, 25 fathoms in length gillnets. Beginning June 12, 2022, subsistence sections 4 (from the refuge boundary at Aniak to the Holitna River mouth) and 5 (Holitna River mouth to headwaters) were opened to subsistence fishing until further notice with 6-inch or less mesh, 25 fathoms in length gillnets. These sections are located outside the YDNWR boundary and not subject to the FSA.

Chum salmon abundance was assessed to be extremely low based on BTF catches, subsistence harvest reports, and Kuskokwim River Sonar passage, while sockeye salmon abundance was estimated to be average to above average. Beginning July 1, 2022, the release of chum salmon captured in fish wheels and beach seines was required throughout Kuskokwim River subsistence sections 4 and 5.

On July 23, when on average 98–100% of the Chinook salmon run, 98–100% of the sockeye salmon run, and 90–97% of the chum salmon run had passed Bethel, the entire Kuskokwim River was opened to subsistence fishing with gillnets, and most mainstem gear restrictions were rescinded. The tributary restrictions were

22. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kuskokwim River Subsistence Fishery, October 24, 2022, Accessed on January 8, 2024. https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1442508330.pdf
23. Alaska Department of Fish and Game, Division of Commercial Fisheries, Kuskokwim River Subsistence Fishery, October 24, 2022, Accessed on January 8, 2024. https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1442508330.pdf
24. *Hereinafter* FSA. The FSB categorizes Special Actions as for Fisheries (FSA) or Wildlife (WSA). For more information see U.S. Department of the Interior, Federal Subsistence Management Program, Special Actions. Accessed January 3, 2024. https://www.doi.gov/subsistence/special-actions

kept in place beyond the mainstem restrictions for the purpose of conservation while Chinook and chum salmon were on their spawning grounds.

In late July and early August, inseason assessment indicated that coho salmon escapement goals at the Kwethluk and Kogrukluk river weirs would not be met. Given the poor coho run, fishing restrictions and gillnet closures were needed for coho salmon protection. Subsistence fishing was closed in all flowing waters of the Kuskokwim River and its tributaries between August 17 and September 15, 2022. Additionally, ADF&G managers did not implement Chinook salmon permits, and there were no commercial salmon fishing periods offered in District 1 during the 2022 season.

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2. METHODS

Study Design

In 2022, household surveys were attempted in 27 of the 38 communities within the Kuskokwim Management Area including 3 communities in South Kuskokwim Bay region, 13 communities in the lower river region, 4 communities in the middle river sections, and 7 communities in the upper river section. The remaining communities either declined to participate (10) or were unable to be surveyed (1). In addition, phone surveys were utilized in communities throughout the KMA as a secondary method to in-person surveys, except 2 communities in the lower river region, 1 community in the middle river region, 6 communities in the upper river region, and 1 community in the South Kuskokwim Bay region (Table 2-2) where in-person surveys could not be conducted and phone surveys served as the primary collection method. The postseason subsistence harvest survey was designed based on stratified random sampling methodology (Cochran 1977) in all communities except Bethel, where a simple random sample was implemented. In the stratified random sampling design, each household was the primary sampling unit. A household generally consists of one or more persons living together in a dwelling and sharing the same mailing address. Households maintain a unique identifier which moves with them if they move between dwellings. Multiple generations living in one dwelling would be considered a single household. Each household was classified into one of five strata based on the household's recent harvest history. The five strata 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 in any of the previous three years;
- Medium harvester: a household that has averaged a harvest of 101–200 salmon per year in any of the previous three years;
- Light harvester: a household that has averaged a harvest of 1–100 salmon per year in any of the previous three years;
- Usually does not fish: a household that did not participate in subsistence fishing activities in any of the previous three years;
- Unknown: a household that has no harvest record within any of the past five years or is new to the community.

For this study, a fishing household was defined as a household that participated in subsistence fishing activities, including both harvesting or processing salmon. The household stratification was updated prior to the survey and was not reassigned during the survey year (i.e., no postsurvey reclassification), with the exception of unknown fishing households. Survey households were selected in each community randomly in the following percentages for each stratum:

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

When the number of households in each stratum within a community is 10 or less, all households in the stratum were selected for sample. Likewise, when the total number of households in a community was fewer than or equal to 40, all households in the community were selected for the sample and the survey method became a census (100% surveyed). This protocol was followed in 2022 for all 27 communities outside Bethel that were surveyed in person or by phone. For each selected household, surveyors attempted

to contact the household at least three separate times. Attempts were made on separate days and at different times of day with at least one visit made after 5:00 pm.

In Bethel, the dwelling (physical location instead of household) was the primary sampling unit. Bethel is a main hub community in western Alaska with a higher transient population than the surrounding communities and where people often change dwellings, making it difficult to maintain an accurate and complete household list with unique identifiers that contains household fishing histories. However, ADF&G Division of Subsistence maintains a dwelling list for Bethel and updates it annually. Dwelling maps are developed from maps provided by the Bethel city planner's office. The map and list are compared and updated both prior to the season and during the season based on surveyor notes. Based on the updated list, occupied dwellings were randomly selected for the survey. Households randomly selected for the survey in Bethel were pursued using rigorous protocols to minimize bias. For each selected dwelling, surveyors were required to attempt contact with the household at least three separate times. Attempts were made on separate days and different times of day with at least one visit made after 5:00 pm or on a weekend. Exceptions included obviously abandoned or derelict dwellings, or when contact was made and the occupant declined to be surveyed. In these cases, the selected dwelling was removed from the sample and replaced by another dwelling selected at random from those not previously selected. The sample goal for Bethel is 25% of the total number of occupied households, and the final number of surveyed households was approximately 21% of the total number of occupied dwellings (Table 1-2).

Postseason subsistence harvest surveys were conducted in late fall after the majority of salmon fishing had ended to maximize fishers' recall of their harvest season. In Bethel, surveys were conducted by ONC Fisheries Technicians; all other communities were surveyed by ADF&G Subsistence Resource Specialists, Fish & Wildlife Technicians, and locally hired research assistants (Table 2-1). Unprecedented staff turnover prior to the beginning of the survey effort delayed the start of data collection and required intensive training of new staff to implement the project. ADF&G technicians were hired and trained in the Fairbanks office prior to fieldwork deployment and received additional training in the field.

Prior to survey work, ADF&G and ONC technicians underwent training to familiarize them with project goals and the survey instrument. Caroline Brown, the Research Director for the Division travelled to Bethel in person to assist with training both ADF&G and ONC technicians. In Bethel, surveyors were trained on all aspects of surveying, which included how to properly conduct the survey as well as effective surveying techniques. Surveyors participated in role-playing exercises that emphasized critical thinking skills and being both cognizant of and appropriately addressing logic errors. Surveyors were trained in salmon species name identification and were also briefed on fishery issues and concerns from the recent subsistence salmon fishing season to improve understanding of community members' responses during surveys. In addition, surveyors were provided with personal protective equipment—latex gloves, facemasks, and hand sanitizer—in order stay in compliance with community health and safety guidelines. Surveyors used COVID-19 test kits to ensure that they were negative for COVID-19 before entering each community.

Before the survey, ADF&G project management staff contacted community tribal officials to request approval to conduct surveys. The inclement weather of the late fall increased logistical challenges of inter-community flights, and staff were only able to conduct in-person surveys in 17 of the 28 communities (Table 2-2). They were unable to visit the community of Lime Village for a variety of logistical reasons, including weather and flight availability. Additionally, harvest in Lime Village could not be generated using Bayesian imputation due to lack of data. The household lists for all communities were annotated and corrected as the surveyors completed the survey process. Surveyors were responsible for attempting contact with each selected household, asking questions consistently and understandably, and fostering a cooperative atmosphere. Surveyors attempted to interview a member of each selected household, preferably the primary harvester. Occasionally, surveys were conducted with households not preselected 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.

Table 2-1.–Project staff, 2022.

Task	Name	Organization
Northern Regional Program Manager	Alida Trainor	ADF&G Division of Subsistence
Principal Investigator	Kathryn Hayden	ADF&G Division of Subsistence
Administrative support	Cheryl Park	ADF&G Division of Subsistence
	Deanne Lincoln	ADF&G Division of Subsistence
	Tamsen Coursey-Willis	ADF&G Division of Subsistence
Data Management Lead	David Koster	ADF&G Division of Subsistence
Programmer	David Koster	ADF&G Division of Subsistence
Data Entry	Reve Tomlin	ADF&G Division of Subsistence
	Carrie Hallinan	ADF&G Division of Subsistence
	Devin Anderson	ADF&G Division of Subsistence
	Loraine Navarro	ADF&G Division of Subsistence
	Halia Valdez	ADF&G Division of Subsistence
Data Cleaning/Validation	Loraine Navarro	ADF&G Division of Subsistence
Data Analysis	Loraine Navarro	ADF&G Division of Subsistence
	Reve Tomlin	ADF&G Division of Subsistence
Cartography	Gayle Neufeld	ADF&G Division of Subsistence
Editorial Review Lead	Adam Knight	ADF&G Division of Subsistence
Production Lead	Adam Knight	ADF&G Division of Subsistence
Field Research Staff	Cassidy Somerville	ADF&G Division of Subsistence
	Andrew Slear	ADF&G Division of Subsistence
	Heather Dorsey	ADF&G Division of Subsistence
	Jacob Egelhoff	ADF&G Division of Subsistence
	Molly Brown	ADF&G Division of Subsistence
	Angela Lexvold	ADF&G Division of Subsistence
Local Research Assistant	Taj Tony	Orutsararmiut Native Council
	David Simeon	Orutsararmiut Native Council
	James Atseriak	Orutsararmiut Native Council
	Mary Hakkila	Orutsararmiut Native Council
	Larry Evan	Orutsararmiut Native Council
	Delores Jimmy	Napakiak
	Johnathan Mark	Quinagahak
	Vera Cleveland	Quinagahak
	Ronn Merrit	Quinagahak
	Christopher Present	Quinagahak
	Kathern Noatak	Kwethluk
	Erik Andrew	Tuntutuliak
	Kathleen Simon	Tuntutuliak

Source ADF&G Division of Subsistence, 2022.

All subsistence harvest data were treated as confidential, such that individual household harvest data were not shared, and all analyses were aggregated and anonymized. The study was conducted in accordance with the Alaska Federation of Natives' Guidelines for Research.[1]

Survey Instrument

In 2022, ADF&G survey staff administered surveys in-person or via telephone to participating households in 27 communities, except for the community of Lime Village. The 2022 survey instrument is included as Appendix A.

Survey Questions

The survey questions were designed to provide a quantitative assessment of each household's subsistence salmon harvest. The survey identified fishing households by asking whether anyone in the surveyed household harvested salmon for subsistence uses. The surveyor was instructed to clarify that harvest includes any participation in the subsistence fishery, including being an active member of a fishing group as someone who processes or cuts harvested fish.

Individual household harvest forms the basis of salmon harvest estimates for this study. Household harvest was defined to include salmon that members of the household gave away, ate fresh or processed for later use, 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.

In order to differentiate group harvest (two or more households fishing together) from individual household harvest, households were asked whether they participated in group harvests or fished alone. If surveyors identified a group harvest, they then asked what portion of the group harvest the individual household kept for itself. This helped to prevent the possibility that a single large harvest might be reported by more than one household in the previously identified fishing group.

The survey included questions about areas fished on the Kuskokwim River, numbers of salmon harvested by species, and gear types used. Households were also asked whether they had given salmon to other families (outside of the fishing group), and whether they had received salmon from other subsistence households (outside of the fishing group) or from a test fishery project. In addition, households were asked how many salmon they lost, and how many they harvested for dog food. Questions about the use of lower Kuskokwim non-spawning tributaries for salmon fishing were added to the post season salmon survey for the 2022 season as part of data collection for an Alaska Sustainable Salmon Fund (AKSSF) project that sought to quantify and describe the harvest and use of these tributaries by Kuskokwim Area fishers. In order to make room for this addition, the 2022 survey did not quantify nonsalmon fish harvests as it had done in previous years.

Fishers who did not know the actual number of fish they harvested occasionally reported harvest in alternative terms, such as the number of five-gallon buckets, plastic bags, gunny sacks, or pounds. ADF&G devised a conversion sheet to estimate fish numbers in these circumstances (Table 2-3).

To assess whether a household was able to meet its subsistence salmon needs, the survey asked respondents whether their needs were met by species, or if they had no need. If needs were not met, respondents were asked to provide information about why.

After the households were interviewed, ADF&G project staff reviewed the survey forms. During this process, staff compared forms from fishing group members to identify discrepancies and made follow-up calls to try to resolve these differences. Occasionally, fishing group members simply did not agree on numbers for salmon harvest. In this event, ADF&G project staff decided 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

1. Alaska Federation of Natives. 2013. "Alaska Federation of Natives Guidelines for Research." Alaska Native Knowledge Network. Accessed December 6, 2022. http://www.ankn.uaf.edu/IKS/afnguide.html

Kuskokwim Annual Post Season Survey (KAPSS) database twice by different staff. The two versions of each household survey record were compared, and errors corrected.

Harvest Calendars

Subsistence salmon harvest calendars (Appendix B) are distributed in late April or early May each year by mass mailing to households identified as those who usually fish. This ensures that calendars are available to fishers prior to the start of the salmon fishing season. Calendar mailings were based on the most current 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 purpose of the harvest calendar is to provide households with a means of recording their salmon and whitefish harvests during the fishing season. The department requests that calendar recipients record their daily subsistence fishing harvest totals and return their completed calendars to the department either by mail or in person to an ADF&G surveyor when completing the postseason household survey. 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 one 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 to ADF&G prior to the survey.

Data Analysis

Harvest Estimation

Expanded Community Harvest

Subsistence salmon harvests reported by sampled households were expanded to estimate total community harvest, by species, using a stratified random sampling expansion technique (Scheaffer, Mendenhall, and Ott 1990), except in Bethel where a simple random sample was used. The stratified expansion procedure was performed for a community only if a sufficient number of households were sampled; alternative approaches were developed on a case-by-case basis. To evaluate stratification performance, analysts conducted ANOVA tests accompanied by visual inspection of box and whisker plots of household harvests by use group. Three communities were identified as having equal means, with a 95% confidence level, and high variance: Eek, Napakiak, McGrath. Because the stratification variables failed to appropriately control for variance, use groups in these communities were pooled for expansion. Due to difficulties in obtaining robust samples in prior years for the purposes of updating use groups, household harvest levels were evaluated to control for outliers. For the purposes of evaluating 2022 data, two criteria were established in the identification of outliers 1) sampling goals of the use group were not met, and 2) the household harvest exceeded the mean for the strata by 2 standard deviations above the mean. In these cases, households were assigned to the use group of their 2023 harvest totals prior to expansion. In all, 20 such households were identified and reclassified. The sample size of Takotna was deemed insufficient for expansion and Bayesian imputation methods were applied.

For harvests of each stratum, if ten or fewer households were surveyed and the proportion of surveyed households was less than 0.25 (for non- and light harvesters) or 0.30 (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 fewer than 50 and the proportion of surveyed households was less than 0.30, total community harvest was not estimated using this method (see section *Harvest Estimation of Nonsurveyed and Undersurveyed Communities* below).

Table 2-2.–Conversion factors.

Reported amount	Converted amount	Description
Chinook salmon		
1 Chinook salmon	5–8 lb	dried and smoked Chinook salmon strips
1 gal Ziploc	5 lb	dried and smoked Chinook salmon strips
1 qt Ziploc	2 lb	dried and smoked Chinook salmon strips
6 gal bucket	4–5 fish	dried Chinook salmon
Chum salmon		
5 gal "poke fish"	25–30 fish	dried chum salmon in seal oil
30 gal barrel	150–180 fish	dried chum salmon in seal oil
1 gal Ziploc	2–3 fish	dried chum salmon filets
5 gal bucket	25 fish	chum salmon filets, tightly packed
1 chum salmon for dog food	2/3 lb	dried summer chum salmon for dog food
1 bundle for dog food	50 fish	dried summer chum salmon for dog food
salmon per dog per winter	300 fish	summer chum salmon for dog food
1 chum salmon	1.25–1.33 lb	dried summer or fall chum salmon
Pink salmon		
1 pink salmon	3 lb	pink salmon

Source ADF&G Division of Subsistence, 2022.

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:

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

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

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

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

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

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

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

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.

The above methods were used for estimation of salmon harvests (Question 7) and the number of people participating in the fishery (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. In the first step, 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:

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

The 95% confidence interval (95% CI_k) was calculated as:

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

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).

Harvest Estimation of Nonsurveyed and Undersurveyed Communities

Harvests of several communities were not estimated in some years either because surveys were not conducted or survey data were insufficient. Harvests of those communities were estimated by employing a Bayesian hierarchical multiple imputation method (Honaker and King 2010; King et al. 2001). In this method, we assumed that:

- Events that cause missing harvest data follow a missing at random process (MAR); and
- Harvest data possess multivariate normal distribution.

Under these conditions, the harvest in a given year and community can be estimated from the harvest estimates of that community in previous years and harvest estimates of surrounding communities during the same time period. For instance, the 2008 harvest of the community of Tuntutuliak (nonsurveyed in that year) was estimated using its known harvests during 1990–2007 and harvests of other lower Kuskokwim River 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 four 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:

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

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 $\boldsymbol{\Sigma}$:

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

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

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

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

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

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 during the survey 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:

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

Analysis of Household Needs Met

Responses about why needs were not met were coded into categories. Response categories were summarized by stratum and expanded by the total number of households in a stratum divided by the number of valid responses and then summed to a community-wide estimate. For final reporting, these estimates were divided by the total number of community households to get a percentage of households indicating reasons for not getting enough fish weighted by stratum group.

3. RESULTS

Household Selection and Survey

In 2022, project staff surveyed 27 communities (Table 3-1); 17 communities were surveyed in-person including Tuntutuliak, Eek, Kasigluk, Nunapitchuk, Napakiak, Napaskiak, Oscarville, Bethel, Kwethluk, Akiachak, Tuluksak, Lower Kalskag, Upper Kalskag, Aniak, Crooked Creek, Quinhagak, and Goodnews Bay. In addition,10 communities were surveyed by telephone including Atmautluak, Akiak, Chuathbaluk, Red Devil, Sleetmute, Stony River, McGrath, Takotna, Nikolai, and Platinum. Of the 2,488 total selected households in the KMA, 1,014 households were surveyed. An additional 100 unselected households were also surveyed. In all, researchers completed 1,114 household surveys. Surveyed households represented 27% of households in the Kuskokwim River drainage and south Kuskokwim Bay portions of the KMA. This sample size was less than the sample size in prior years. Staff were unable to conduct surveys in the community of Lime Village (5 households) due to logistical issues.

Bethel households composed 33% of the 1,114 surveyed households throughout the KMA. Surveyors employed by Orutsararmiut Native Council (ONC) contacted a simple random sample of dwellings in Bethel. In all, 1,089 Bethel households were selected to be surveyed, and 369 households (21%) were surveyed.

Estimated Fishing Households and Region Population Size

Of an estimated 4,107 households in the KMA, approximately 2,036 (50%) households participated in the Kuskokwim area salmon subsistence fishery in 2022 (Table 3-2). These 4,107 households represented an estimated 14,747 individuals (Table 1-2). The average number of people per household was 3.6 individuals (tables 1-2 and 3-1).

Harvest and Use of Salmon

Harvest Estimates

Overall, an estimated 125,519 salmon were harvested in 2022 for subsistence uses. The total combined estimated harvest by species for the surveyed communities in the surveyed portion of the KMA was 39,335 (95% CI ±3,612) Chinook salmon; 12,844 (95% CI ±1,470) chum salmon; 55,242 (95% CI ±5,237) sockeye salmon; 17,024 (95% CI ±2,482) coho salmon; and 1,074 (95% CI ±350) pink salmon (Table 3-3). Lower Kuskokwim River fishers harvested the bulk (79%) of the total subsistence salmon harvest in 2022 (Table 3-3). Lower Kuskokwim River fishers harvested 77% of all Chinook salmon, 79% of all chum salmon, 81% of all sockeye salmon, 81% of all coho salmon, and 71% of all pink salmon in 2022. Middle Kuskokwim River fishers harvested 8% of all Chinook salmon, 5% of all chum salmon, 4% of all sockeye salmon, 5% of all coho salmon, and 15% of all pink salmon. Upper Kuskokwim River fishers harvested 2% of all Chinook salmon, 1% of all chum salmon, 1% of all sockeye salmon, 3% of all coho salmon, and <1% of all pink salmon. Fishers in south Kuskokwim Bay harvested 13% of all Chinook salmon, 16% of all chum salmon, 14% of all sockeye salmon, 10% of all coho salmon, and 14% of all pink salmon. Expanded harvest results per community can be found in Appendix D.

Bethel, a regional hub with the largest population in the Kuskokwim River drainage, is located in the lower Kuskokwim River region. Bethel's relatively high population naturally puts more harvest pressure on each run of salmon. Of the salmon caught by lower Kuskokwim River communities, Bethel harvested 39% of Chinook, chum, and sockeye salmon in 2022, and 50% and 36% of coho and pink salmon in that same year, respectively (Table 3-3). Of the salmon caught by all surveyed communities, Bethel's harvest represented 32% of the total Chinook salmon harvested by the surveyed communities within the KMA in 2022, 24% of the total chum salmon harvest, and 31%, 40%, and 22% of the total sockeye, coho, and pink salmon harvested, respectively, in that year. Due to Bethel's location on the lower Kuskokwim River in tandem with its large population as compared to other KMA communities, Bethel fishers take the largest

percentage (37%) of the salmon harvest of communities residing along the Kuskokwim River. However, although Bethel does harvest more salmon than other communities, Bethel households harvest less per household harvest than is harvested by households in smaller communities across the region. For example, the average harvest for Chinook salmon among lower Kuskokwim River households in 2022 was ten fish per household, whereas the average harvest among Bethel households was seven fish; Bethel had one of the two lowest per household harvest of Chinook salmon of any community in the surveyed portion of the lower Kuskokwim River (Table 3-3). Bethel also had the lowest per household average harvest for both chum and sockeye salmon. However, both fishing patterns and species abundance vary greatly throughout the KMA, and residents of Bethel have proximate access to all five species of salmon during season openers. By comparison, the upper river communities have access to only three species: Chinook, chum, and coho salmon. Many rural Alaskan communities do not have immediate access to repair services for their boats, engines, popular gillnets, and gear, which are essential to successful subsistence harvests of salmon. Due to Bethel's larger population size, commercial services are available to Bethel residents that are not available to other rural communities. This provides Bethel residents with a greater opportunity to purchase and maintain the gear that facilitates salmon harvest.

Harvest by Gear Type

As mentioned in the Introduction chapter, some gear types are more effective than others in the different sections of the river because of both the fishers' knowledge and the physical nature of fishing locations in each section of the drainage. For example, productive fishing locations near the middle Kuskokwim River communities of Lower Kalskag and Upper Kalskag are limited due to a smaller number of productive eddies as well as the high prevalence of net-snagging debris in this area of the river. As a result, fishers commonly line up their boats and wait for their turn to deploy their drift gillnets in the few select areas known to be most productive (McDevitt et al. 2021a). In contrast, fishers in the lower Kuskokwim River generally have more options for fishing locations, and these locations typically have less net-snagging debris present.

In 2022, among communities where responses were provided by households regarding gear type used 43% of households (482 of 1,114) reported drift gillnets as the primary gear type used for subsistence salmon fishing (Table 3-4). The next most common gear type, which represents 7% of households, was set gillnets (79 of 1,114) followed by hook and line (32 of 1,114) accounting for three percent of households. At the management area level, drift gillnets were the most commonly used gear type among lower and middle Kuskokwim River households as well as south Kuskokwim Bay households, whereas set gillnets were the most commonly used gear type in the upper Kuskokwim River. Many households in Aniak as well as in south Kuskokwim Bay used hook and line. Many Aniak residents use hook and line gear to fish for coho salmon at or slightly downstream of the mouth of the Aniak River, and many fishers in south Kuskokwim Bay communities may use hook and line gear to target coho salmon as well as nonsalmon species such as Dolly Varden (Ikuta et al. 2016). Gear type estimates were not expanded.

Households Receiving Salmon

Sharing and receiving salmon is an integral component of the annual harvest. In 2022, based on responses provided by nearly 1,100 households that were asked about salmon they received, households received an estimated 4,078 (95% CI ± 829) Chinook salmon (Table 3-5), or 10% of the total subsistence Chinook salmon harvest (Tables 3-2 and 3-5). Households received approximately 1,882 (95% CI ± 528) chum salmon; 7,176 (95% CI ± 1,664) sockeye salmon; 3,722 (95% CI ± 1,816) coho salmon; and 144 (95% CI ± 73) pink salmon (Table 3-5).

The Bethel Test Fishery (BTF) and other fish monitoring projects in the Kuskokwim River also distributed salmon harvest to households in the area through a variety of ways. These projects included the test fisheries projects operated by ADF&G in Bethel and by the Native Village of Napaimute (NVN) in Aniak. The ADF&G BTF crew reported a total harvest of 2,995 fish, 2,968 (or 99%) of which were salmon.[1] The harvest included 378 Chinook (13%), 1,150 chum (38%), 648 sockeye (22%), 724 coho (24%), and 68

1. S. Larson, ADF&G Fisheries Research Biologist, personal communication, July 31, 2023.

Table 3-1.–Households selected and surveyed by user group, surveyed communities, Kuskokwim Management Area, 2022.

Community	Total households	Households selected for survey	Selected households surveyed	Unselected households surveyed	Percentage of selected households surveyed	Households refusing survey[c]	Households surveyed	Percentage of households surveyed
Kongiganak[a]	90	–	–	–	–	–	–	0%
North Kuskokwim Bay	**90**	–	–	–	–	–	–	**0%**
Tuntutuliak	126	80	37	2	46%	15	39	31%
Eek	98	54	24	5	44%	16	29	30%
Kasigluk	109	64	40	8	63%	12	48	44%
Nunapitchuk	131	81	47	7	58%	13	54	41%
Atmautluak	69	47	20	1	43%	6	21	30%
Napakiak	111	69	24	3	35%	15	27	24%
Napaskiak	116	77	29	3	38%	6	32	28%
Oscarville	21	21	11	0	52%	4	11	52%
Bethel[b]	1,795	1,089	369	0	34%	279	369	21%
Kwethluk	182	108	59	15	55%	17	74	41%
Akiachak	177	101	30	5	30%	15	35	20%
Akiak	92	57	21	3	37%	8	24	26%
Tuluksak	105	63	40	6	63%	8	46	44%
Lower Kuskokwim River	**3,132**	**1,911**	**751**	**58**	**39%**	**414**	**809**	**26%**
Lower Kalskag	96	50	18	4	36%	15	22	23%
Upper Kalskag	55	31	12	4	39%	6	16	29%
Aniak	162	85	34	6	40%	12	40	25%
Chuathbaluk	30	30	20	0	67%	1	20	67%
Middle Kuskokwim River	**343**	**196**	**84**	**14**	**43%**	**34**	**98**	**29%**
Crooked Creek	37	37	25	0	68%	4	25	68%
Red Devil	7	7	4	0	57%	0	4	57%
Sleetmute	34	34	14	0	41%	0	14	41%
Stony River	14	14	4	0	29%	0	4	29%
Lime Village[a]	5	5	**0**	**0**	**0%**	**1**	**0**	0%

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Table 3-1.–Page 2 of 2.

Community	Total households	Households selected for survey	Selected households surveyed	Unselected households surveyed	Percentage of selected households surveyed	Households refusing survey[c]	Households surveyed	Percentage of households surveyed
McGrath	94	41	16	16	39%	1	32	34%
Takotna	24	24	5	0	21%	0	5	21%
Nikolai	31	31	21	0	68%	0	21	68%
Upper Kuskokwim River	**246**	**193**	**89**	**16**	**46%**	**6**	**105**	**43%**
Kuskokwim River Total[d]	**3,721**	**2,300**	**924**	**88**	**40%**	**454**	**1,012**	**27%**
Quinhagak	195	125	66	10	53%	26	76	39%
Goodnews Bay	83	45	14	2	31%	17	16	19%
Platinum	18	18	10	0	56%	2	10	56%
South Kuskokwim Bay	**296**	**188**	**90**	**12**	**48%**	**45**	**102**	**34%**
Kuskokwim Area Total	**4,107**	**2,488**	**1,014**	**100**	**41%**	**499**	**1,114**	**27%**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are not available.

a. No surveys were conducted in these communities.

b. The sampling strategy for Bethel remained at 25% for the 2022 study period. The difference between total selected households and a combination of those refusing and those contacted represent households that did not respond to three attempts.

c. Number of refusals is a minimum estimate due to inconsistent tracking.

d. Kuskokwim River Total includes lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table 3-2.–Estimated number of households by subsistence fishery participation, surveyed communities, Kuskokwim Management Area, 2022.

Community	Total households	Households sampled	Estimated number of fishing households	95% CI
Kongiganak[a]	90	0	–	–
North Kuskokwim Bay	**90**	**0**	–	–
Tuntutuliak	126	39	91	40
Eek[b]	98	29	71	14
Kasigluk	109	48	63	11
Nunapitchuk	131	54	60	13
Atmautluak	69	21	30	57
Napakiak[b]	111	27	62	19
Napaskiak	116	32	106	7
Oscarville	21	11	10	3
Bethel	1,795	369	773	81
Kwethluk	182	74	92	15
Akiachak	177	35	96	75
Akiak	92	24	72	17
Tuluksak	105	46	55	19
Lower Kuskokwim River	**3,132**	**809**	**1,582**	**106**
Lower Kalskag	96	22	54	23
Upper Kalskag	55	16	36	14
Aniak	162	40	77	25
Chuathbaluk	30	20	11	4
Middle Kuskokwim River	**343**	**98**	**177**	**35**
Crooked Creek	37	25	19	6
Red Devil	7	4	1	2
Sleetmute	34	14	15	6
Stony River	14	4	1	0
Lime Village[a,c]	5	0	–	–
McGrath[b]	94	32	18	11
Takotna[c]	24	5	–	–
Nikolai[b]	31	21	9	4
Upper Kuskokwim River	**246**	**105**	**62**	**13**
Kuskokwim River Total[d]	**3,721**	**1,012**	**1,821**	**111**
Quinhagak	195	76	155	18
Goodnews Bay	83	16	49	16
Platinum	18	10	11	4

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Table 3-2.–Page 2 of 2.

Community	Total households	Households sampled	Estimated number of fishing households	95% CI
South Kuskokwim Bay	**296**	**102**	**215**	**22**
Kuskokwim Area Total	**4,107**	**1,114**	**2,036**	**113**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are unavailable or undefined.

Note Household pre-season use-group classifications were evaluated based on 2022 harvests. Twenty-one households were re-classified into higher-harvesting use groups based on 2022 harvest levels if 1) their harvest was more then two standard deviations above the mean for the strata group and 2) sampling goals for the strata group were not met. New households or households classified as having 'Unknown' harvest levels were not reclassified.

a. No surveys were conducted in these communities.

b. ANOVA means tests from use-group classification were not significant at the 95% level. Estimates were derived from a single community mean.

c. The number of households that fished was not estimated for communities for which a Bayesian imputation was used to develop estimates.

d. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

(2%) pink salmon. The remaining harvest was composed of various nonsalmon fish species. ONC staff distributed a portion of fish harvested in the BTF to elderly, widowed, or disabled residents throughout Bethel and several elders in Tuluksak. The remaining BTF harvest was made available to Bethel residents on a first-come-first-served basis through use of the BTF "free fish bin." The ADF&G Kuskokwim River sonar project also made fish available at the sonar camp, both on a on a first-come-first-served basis as well as by delivery to the nearby community of Kwethluk for distribution. ADF&G sonar project staff reported a total harvest of 1,494 fish (61% of which were salmon).[2] Both salmon and nonsalmon fish were retained and made available at the sonar camp. Sonar staff also delivered fish to the nearby community of Kwethluk. The NVN Aniak test fishery reported catches of five Chinook salmon and all other fish were live released.

Subsistence Use of Salmon for Dog Food

Historically, the dog sled was the primary winter mode of transportation in the area. As such, many area residents maintained dog teams and harvested large amounts of salmon to feed their dogs. The introduction of the snowmachine, however, changed the way people traveled. As a result, far fewer families maintain dog teams today. However, some Kuskokwim area residents still do own dog teams. Many of these individuals actively participate in a variety of annual dog sled races on the Kuskokwim River each winter, and presumably harvest salmon for dogs (Godduhn et al. 2020).

In 2022, an estimated 2,277 households owned dogs in the KMA. The estimated total number of dogs within the KMA was 4,977 in 2022. The total number of salmon fed to dogs, which includes whole fish reported as lost due to spoilage, was 4,689 salmon (Table 3-6). Households with dogs owned an average of two dogs per household. Three-hundred and four households fed whole salmon to dogs (13% of households with dogs), and these households fed an average of 15 salmon per household to dogs.

Communities that harvested the highest numbers of salmon that were used for dog food included the lower Kuskokwim River communities of Bethel, Akiak, and Akiachak. In 2022, Bethel residents reported harvesting 1,380 salmon for dog food while Akiachak reported harvesting 470 salmon for dog food, and Akiak reported harvesting 473 salmon for dog food.

Lost Fish

In 2022, for communities where questions about lost fish were asked (all surveyed communities except Bethel), 514 of 1,114 (46%) respondents indicated that they lost fish during the 2022 season (Table 3-7). Area residents reported 6,619 (5% of the total salmon harvest) salmon as lost (i.e., not edible due to spoilage, animals, or other reasons). The 514 households that reported losing fish provided 157 responses as to the reasons for the losses. Of these reasons, 103 (66%) were related to weather (e.g., rainy weather prevented adequate drying) and 21 (13%) were related to diseased fish (e.g., parasites or sores). Reported numbers of lost salmon were not expanded.

Subsistence Salmon Needs

In an effort to gain a better understanding of harvest at the household level and the various factors that may affect household harvest goals, respondents were asked if they were able to achieve their household harvest goals for each salmon species during the 2022 season. The following discussion focuses on the proportions of households within the surveyed communities that achieved or did not achieve their harvest goals by species and the factors that affected reaching these goals.

Chinook Salmon

Respondents from 1,084 households provided valid responses to researchers when asked if the household achieved their Chinook salmon harvest goals in 2022 (Table 3-8). Of these households, 41% met their Chinook salmon goals, and 52% of households did not. An additional 7% responded that they did not need Chinook salmon. Households that did not reach their harvest goals for Chinook salmon most commonly cited personal reasons, (e.g., health, work obligations), followed by management actions (e.g., closures,

2. S. Larson, ADF&G Fisheries Research Biologist, personal communication, July 31, 2023.

Table 3-3.–Total estimated subsistence salmon harvest by species and community, surveyed communities, Kuskokwim Management Area, 2022.

Community	Households			Salmon species																
				Chinook			Chum			Sockeye			Coho			Pink				
	Total households	Households surveyed	Percentage of households surveyed	Estimated average harvest per household	Estimated total harvest	CI (95%)	Estimated average harvest per household	Estimated total harvest	CI (95%)	Estimated average harvest per household	Estimated total harvest	CI (95%)	Estimated average harvest per household	Estimated total harvest	CI (95%)	Estimated average harvest per household	Estimated total harvest	CI (95%)		
Kongiganak [a]	90	0	0%	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**90**	**0**	**0%**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	126	39	31%	19	2,361	646	8	1,015	296	21	2,618	904	4	465	217	0	14	5		
Eek [c]	98	29	30%	13	1,281	532	8	795	448	26	2,549	1,239	9	906	433	0	18	21		
Kasigluk	109	48	44%	14	1,532	408	6	653	240	25	2,723	856	5	513	265	0	8	6		
Nunapitchuk	131	54	41%	19	2,493	507	5	669	243	26	3,444	989	4	580	298	1	109	188		
Atmautluak	69	21	30%	11	728	369	9	643	1,988	36	2,482	1,444	11	733	805	0	33	122		
Napakiak [c]	111	27	24%	7	806	398	3	325	212	18	2,013	1,400	6	617	414	0	25	32		
Napaskiak	116	32	28%	13	1,453	697	5	594	346	26	3,055	1,237	5	616	3,310	0	14	18		
Oscarville	21	11	52%	3	58	34	5	110	77	18	384	211	2	37	27	0	0	0		
Bethel	1,795	369	21%	7	12,639	2,972	2	3,048	797	10	17,249	4,056	4	6,814	1,856	0	240	143		
Kwethluk	182	74	41%	11	1,963	352	3	544	216	15	2,703	517	5	824	351	0	68	47		
Akiachak	177	35	20%	16	2,834	958	3	554	329	13	2,362	1,074	4	723	706	0	29	83		
Akiak	92	24	26%	14	1,321	476	5	493	492	17	1,589	546	5	475	276	1	79	143		
Tuluksak	105	46	44%	8	866	188	6	663	197	13	1,387	812	4	423	153	1	123	100		
Lower Kuskokwim River	**3,132**	**809**	**26%**	**10**	**30,334**	**3,373**	**3**	**10,105**	**1,367**	**14**	**44,561**	**5,077**	**4**	**13,726**	**2,294**	**0**	**760**	**281**		
Lower Kalskag	96	22	23%	10	923	1,000	3	250	80	3	316	115	2	163	202	1	53	74		
Upper Kalskag	55	16	29%	14	783	505	4	193	146	10	562	290	3	148	201	2	105	254		
Aniak	162	40	25%	7	1,128	545	0	76	54	7	1,117	586	4	612	686	0	0	0		
Chuathbaluk	30	20	67%	9	277	26	2	67	44	6	175	36	0	7	5	0	1	0		
Middle Kuskokwim River	**343**	**98**	**29%**	**9**	**3,111**	**1,062**	**2**	**585**	**157**	**6**	**2,170**	**633**	**3**	**931**	**711**	**0**	**159**	**251**		
Crooked Creek	37	25	68%	8	292	40	1	33	9	8	310	9	2	68	–	0	0	0		
Red Devil	7	4	57%	3	19	27	0	0	0	4	25	36	0	0	0	0	0	0		

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Table 3-3.–Page 2 of 2.

Community	Households			Salmon species																
				Chinook			Chum			Sockeye			Coho			Pink		
	Total households	Households surveyed	Percentage of households surveyed	Estimated average harvest per household	Estimated total harvest	CI (95%)	Estimated average harvest per household	Estimated total harvest	CI (95%)	Estimated average harvest per household	Estimated total harvest	CI (95%)	Estimated average harvest per household	Estimated total harvest	CI (95%)	Estimated average harvest per household	Estimated total harvest	CI (95%)
Sleetmute	34	14	41%	2	80	21	0	0	0	10	343	123	2	85	87	0	0	0
Stony River	14	4	29%	0	0	0	0	0	0	0	0	0	1	10	0	0	0	0
Lime Village[b]	5	0	0%	4	19	7	1	4	1	19	96	7	0	2	10	–	–	–
McGrath[c]	94	32	34%	1	88	83	1	97	146	0	24	39	4	411	453	0	3	5
Takotna[b]	24	5	21%	0	0	–	0	0	–	0	0	–	0	8	24	–	–	–
Nikolai[c]	31	21	68%	7	210	104	0	0	0	0	0	0	0	0	0	0	0	0
Upper Kuskokwim River	**246**	**105**	**43%**	**3**	**708**	**136**	**1**	**134**	**146**	**3**	**798**	**127**	**2**	**584**	**458**	**0**	**3**	**5**
Kuskokwim River Total[d]	**3,721**	**1,012**	**27%**	**9**	**34,153**	**3,509**	**3**	**10,825**	**1,381**	**13**	**47,528**	**5,112**	**4**	**15,241**	**2,426**	**0**	**923**	**345**
Quinhagak	195	76	39%	21	4,004	767	9	1,832	548	25	4,802	974	8	1,508	541	1	107	62
Goodnews Bay	83	16	19%	12	963	509	0	26	15	30	2,460	770	2	162	136	0	41	28
Platinum	18	10	56%	12	215	55	9	162	19	25	452	593	6	113	48	0	4	–
South Kuskokwim Bay	**296**	**102**	**34%**	**18**	**5,182**	**881**	**7**	**2,019**	**549**	**26**	**7,714**	**1,183**	**6**	**1,783**	**551**	**1**	**152**	**66**
Kuskowkim Area Total	**4,107**	**1,114**	**27%**	**10**	**39,335**	**3,612**	**3**	**12,844**	**1,470**	**13**	**55,242**	**5,237**	**4**	**17,024**	**2,482**	**0**	**1,074**	**350**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Bold, italic text indicates Bayesian estimates.

Note Dashes indicate that data are unavailable.

Note Household pre-season use-group classifications were evaluated based on 2022 harvests. Twenty-one households were re-classified into higher-harvesting use groups based on 2022 harvest levels if 1) their harvest was more then two standard deviations above the mean for the strata group and 2) sampling goals for the strata group were not met. New households or households classified as having 'Unknown' harvest levels were not reclassified.

a. Community was not surveyed. Harvest was not estimated due to lack of recent data.

b. Bayesian imputation was used to develop estimates.

c. ANOVA means tests from use-group classification were not significant at the 95% level. Estimates were derived from a single community mean.

d. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table 3-4.–Primary fishing gear used by households, surveyed communities, Kuskokwim Management Area, 2022.

Community	Total households	Surveyed households	Gear types					
			Setnet	Driftnet	Fish wheel	Hook and line	Dip net	Other
Kongiganak[a]	90	0	–	–	–	–	–	–
North Kuskokwim Bay	**90**	**0**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	126	39	3	28	0	0	0	0
Eek	98	29	7	14	0	0	0	0
Kasigluk	109	48	0	29	0	0	0	0
Nunapitchuk	131	54	1	27	0	0	0	0
Atmautluak	69	21	2	12	0	0	0	0
Napakiak	111	27	4	11	0	0	0	0
Napaskiak	116	32	3	24	0	0	0	0
Oscarville	21	11	0	7	0	0	0	0
Bethel	1,795	369	5	135	0	5	2	0
Kwethluk	182	74	4	36	0	1	0	0
Akiachak	177	35	2	23	0	0	0	0
Akiak	92	24	6	12	0	0	0	0
Tuluksak	105	46	5	22	0	0	0	0
Lower Kuskokwim River	**3,132**	**809**	**42**	**380**	**0**	**6**	**2**	**0**
Lower Kalskag	96	22	2	12	0	0	0	0
Upper Kalskag	55	16	2	9	0	0	0	0
Aniak	162	40	2	15	0	2	0	0
Chuathbaluk	30	20	0	7	0	2	0	0
Middle Kuskokwim River	**343**	**98**	**6**	**43**	**0**	**4**	**0**	**0**
Crooked Creek	37	25	4	8	1	2	0	0
Red Devil	7	4	0	1	0	0	0	0
Sleetmute	34	14	0	1	6	0	0	0
Stony River	14	4	1	0	0	0	0	0
Lime Village[a]	5	0	–	–	–	–	–	–

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Table 3-4.–Page 2 of 2.

Community	Total households	Surveyed households	Gear types					
			Setnet	Driftnet	Fish wheel	Hook and line	Dip net	Other
McGrath	94	32	5	0	0	1	0	0
Takotna	24	5	0	0	0	0	0	0
Nikolai	31	21	1	0	0	5	0	0
Upper Kuskokwim River	**246**	**105**	**11**	**10**	**7**	**8**	**0**	**0**
Kuskokwim River Total[b]	**3,721**	**1,012**	**59**	**433**	**7**	**18**	**2**	**0**
Quinhagak	195	76	10	41	0	13	0	0
Goodnews	83	16	7	6	0	0	1	0
Platinum	18	10	3	2	0	1	0	0
South Kuskokwim Bay	**296**	**102**	**20**	**49**	**0**	**14**	**1**	**0**
Kuskokwim Area Total	**4,017**	**1,114**	**79**	**482**	**7**	**32**	**3**	**0**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are unavailable.

a. No surveys were collected in these communities.

b. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

gear restrictions), and lastly, run dynamics (e.g., poor run strength during openers, run timing). In addition, 7% of households indicated that they did not fish for Chinook salmon.

At the regional level, 784 (25% of estimated total households) lower Kuskokwim River households provided valid responses to researchers who asked if the household achieved their subsistence harvest goals for Chinook salmon in 2022 (Table E1). Of these households, over one-third (41%) met all of their Chinook salmon goals, and 53% of households did not. The communities of Akiachak, Eek, and Tuntutuliak had the highest percentages of households that achieved their Chinook salmon harvest goals. For lower Kuskokwim River households that did not achieve their harvest goals, the most common responses were management actions, followed by personal reasons and equipment issues. In addition, 6% of lower Kuskokwim River households indicated that they had no need for Chinook salmon.

In middle Kuskokwim River communities, 96 (28% of estimated total households) households provided valid responses to the question of whether they achieved their subsistence harvest goals for Chinook salmon in 2022. Of these households, 30% met their Chinook salmon harvest goals, and 57% did not. Households that did not reach their harvest goals for Chinook salmon most often cited personal reasons, followed by equipment issues and management actions. In addition, 13% of households indicated that they had no need for Chinook salmon.

In upper Kuskokwim River communities, a total of 104 (42% of estimated total households) household respondents provided responses to researchers who asked if the household achieved their subsistence harvest goals for Chinook salmon in 2022. Of these households, only 23% met their Chinook salmon harvest goals, and 59% did not meet their harvest goals. For the households that did not reach their harvest goals for Chinook salmon, the most common response was due to personal reasons. Run dynamics were the second most commonly cited reason for households that did not meet their Chinook salmon harvest goals. Only 19% of McGrath and Nikolai residents met their needs for salmon, and in Takotna no surveyed households met their harvest needs.

Over one half (65%) of south Kuskokwim Bay households achieved their Chinook salmon harvest goals, and Quinhagak had the highest percentage of households to do so. For the households that did not reach their harvest goals for Chinook salmon, the most common responses were personal reasons and run dynamics. Finally, 3% of south Kuskokwim Bay households expressed no need for Chinook salmon.

The 2022 drainagewide Chinook salmon harvest was higher than that of 2021, but still significantly less than historical harvests prior to 2013 (Table A1). In only seven communities—Tuntutuliak, Eek, Akiachak, Upper Kalskag, Stony River, Quinhagak, and Goodnews Bay—did 50% or more households meet their Chinook salmon harvest goals (Table E1). In contrast, in 19 communities 50% or more of households did not meet their Chinook salmon harvest goals, including 9 of 12 lower river communities.

Chum Salmon

Based on responses from 1,077 households across the drainage, only 30% of households achieved their chum salmon harvest goals in 2022, whereas 52% of households did not (Table 3-8). Households that did not reach their harvest goals for chum salmon most commonly reported personal reasons, followed by management actions and equipment issues. In addition, 18% of households indicated that they had no need for chum salmon.

Only one-third (32%) of surveyed lower Kuskokwim River households (excluding Bethel) met their chum salmon harvest goals whereas 56% did not (Table E2). The most commonly cited reasons for lower Kuskokwim River community households that did not achieve their chum salmon harvest goals were personal reasons, followed by management decisions, and equipment issues. The lower Kuskokwim River communities of Kwethluk and Tuluksak had the highest percentages of households that did not achieve their chum salmon harvest goals (74%, respectively). The communities of Tuntutuliak and Nunapitchuk had the highest percentages of households that met their chum salmon harvest goals, but less than half of households in each community were able to do so. Lastly, 12% of lower river households indicated no need for chum salmon.

Table 3-5.–Estimated number of salmon received from subsistence fisheries, surveyed communities, Kuskokwim Management Area, 2022.

Community	Total households	Surveyed households	Salmon species									
			Chinook		Chum		Sockeye		Coho		Pink	
			Estimate	CI (95%)	Estimate	CI (95%)	Estimate	CI (95%)	Estimate	CI (95%)	Estimate	CI (95%)
Kongiganak[a]	90	0	–	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**90**	**0**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	126	39	444	329	171	113	1,286	1797	710	2,377	47	45
Eek[b]	98	29	120	105	68	116	111	103	10	13	0	0
Kasigluk	109	48	413	273	171	185	491	260	78	58	13	21
Nunapitchuk	131	54	189	152	42	33	152	123	201	234	0	0
Atmautluak	69	21	64	69	48	58	113	81	13	14	0	0
Napakiak[b]	111	27	522	558	296	371	563	437	119	98	0	0
Napaskiak	116	32	72	71	5	7	175	184	5	7	2	4
Oscarville	21	11	1	3	0	0	45	65	4	6	0	0
Bethel	1,795	369	952	273	415	193	1,571	423	1,451	572	10	17
Kwethluk	182	74	256	135	168	89	493	218	132	109	23	33
Akiachak	177	35	188	153	152	162	598	470	508	452	14	15
Akiak	92	24	52	96	29	48	141	238	34	48	8	14
Tuluksak	105	46	23	18	114	137	341	546	43	42	5	8
Lower Kuskokwim River	**3,132**	**809**	**3,298**	**781**	**1,681**	**516**	**6,082**	**1651**	**3310**	**1824**	**121**	**62**
Lower Kalskag	96	22	31	57	12	18	37	55	0	0	0	0
Upper Kalskag	55	16	92	71	21	51	183	180	45	56	21	51
Aniak	162	40	314	262	0	0	130	116	105	183	0	0
Chuathbaluk	30	20	12	14	3	5	63	81	14	2	0	0
Middle Kuskokwim River	**343**	**98**	**448**	**271**	**37**	**50**	**414**	**198**	**164**	**187**	**21**	**51**
Crooked Creek	37	25	17	8	1	2	15	12	3	3	0	0
Red Devil	7	4	0	0	3	4	19	27	0	0	0	0
Sleetmute	34	14	17	20	0	0	48	79	0	0	0	0
Stony River	14	4	0	0	0	0	7	23	9	30	0	0

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Table 3-5.–Page 2 of 2.

Community	Total households	Surveyed households	Salmon species									
			Chinook		Chum		Sockeye		Coho		Pink	
			Estimate	CI (95%)	Estimate	CI (95%)	Estimate	CI (95%)	Estimate	CI (95%)	Estimate	CI (95%)
Lime Village[a]	5	0	–	–	–	–	–	–	–	–	–	–
McGrath[b]	94	32	9	15	0	0	92	101	7	10	0	0
Takotna	24	5	5	13	0	0	0	0	0	0	0	0
Nikolai[b]	31	21	23	10	8	6	2	2	2	2	2	2
Upper Kuskokwim River	**246**	**105**	**71**	**27**	**11**	**6**	**182**	**124**	**20**	**23**	**2**	**2**
Kuskokwim River Total[c]	**3,721**	**1,012**	**3,816**	**823**	**1,729**	**518**	**6,678**	**1658**	**3,494**	**1,818**	**144**	**73**
Quinhagak	195	76	210	99	150	115	356	158	167	89	0	0
Goodnews Bay	83	16	50	52	2	3	115	129	52	79	0	0
Platinum	18	10	2	3	2	3	27	51	9	13	0	0
South Kuskokwim Bay	**296**	**102**	**262**	**107**	**153**	**116**	**498**	**185**	**228**	**112**	**0**	**0**
Kuskokwim Area Total	**4,107**	**1,114**	**4,078**	**829**	**1,882**	**528**	**7,176**	**1,664**	**3,722**	**1,816**	**144**	**73**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate data are unavailable.

Note Household pre-season use-group classifications were evaluated based on 2022 harvests. Twenty-one households were re-classified into higher-harvesting use groups based on 2022 harvest levels if 1) their harvest was more then two standard deviations above the mean for the strata group and 2) sampling goals for the strata group were not met. New households or households classified as having 'Unknown' harvest levels were not reclassified.

a. No surveys were conducted in these communities.

b. ANOVA means tests from use-group classification were not significant at the 95% level. Estimates were derived from a single community mean.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table 3-6.–Estimated use of salmon for dog food, surveyed communities, Kuskokwim Management Area, 2022.

Community	Households		Total number of dogs	Total number of whole salmon fed to dogs[e]
	Own dogs	Fed whole salmon to dogs		
Kongiganak[a]	–	–	–	–
North Kuskokwim Bay	**–**	**–**	**–**	**–**
Tuntutuliak	85	24	213	397
Eek[b]	84	7	162	78
Kasigluk	84	12	246	233
Nunapitchuk	91	7	175	89
Atmautluak	53	17	135	261
Napakiak[b]	78	12	160	222
Napaskiak	102	34	187	178
Oscarville	11	3	23	67
Bethel	769	44	1,343	1,380
Kwethluk	144	23	536	161
Akiachak	72	60	188	470
Akiak	51	15	138	473
Tuluksak	95	10	233	178
Lower Kuskokwim River	**1,719**	**267**	**3,740**	**4,186**
Lower Kalskag	70	1	108	8
Upper Kalskag[c]	37	4	114	–
Aniak	94	4	198	15
Chuathbaluk	17	0	50	0
Middle Kuskokwim River	**218**	**9**	**469**	**23**
Crooked Creek	28	0	76	0
Red Devil	3	0	3	0
Sleetmute	16	0	34	0
Stony River	2	0	2	0
Lime Village[a]	5	–	–	–
McGrath[b]	47	3	156	241
Takotna	15	0	25	0
Nikolai[b]	24	1	62	15
Upper Kuskokwim River	**140**	**4**	**358**	**256**
Kuskokwim River Total[d]	**2,077**	**280**	**4,566**	**4,465**
Quinhagak	147	22	281	224
Goodnews Bay[c]	42	2	110	–
Platinum	11	0	20	0

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Table 3-6.–Page 2 of 2.

Community	Households		Total number of dogs	Total number of whole salmon fed to dogs[e]
	Own dogs	Fed whole salmon to dogs		
South Kuskokwim Bay	**200**	**23**	**411**	**224**
Kuskokwim Area Total	**2,277**	**304**	**4,977**	**4,689**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are unavailable.

Note Household pre-season use-group classifications were evaluated based on 2022 harvests. Twenty-one households were re-classified into higher-harvesting use groups based on 2022 harvest levels if 1) their harvest was more then two standard deviations above the mean for the strata group and 2) sampling goals for the strata group were not met. New households or households classified as having 'Unknown' harvest levels were not reclassified.

a. No surveys were collected in these communities.

b. ANOVA means tests from use-group classification were not significant at the 95% level. Estimates were derived from a single community mean.

c. No estimates were calculated for communities where households that reported feeding fish to dogs didn't provide a total number of salmon fed to dogs.

d. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

e. Includes whole fish reported as lost (due to spoilage etc.) and fed to dogs.

Table 3-7.–Reported number of salmon lost and reasons for losses, surveyed communities, Kuskokwim Management Area, 2022.

Community	Households			Estimated total number of salmon lost	Reason given for loss (reported)								
	Total	Surveyed	Estimated lost salmon		Animal	Disease	Equipment	Human	Personal	Weather	Other Reason	Irrelevant	No Reason
Kongiganak[a]	90	0	–	–	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**90**	**0**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	126	39	40	576	1	2	0	0	0	7	0	0	1
Eek[b]	98	29	10	84	0	0	0	0	0	3	0	0	0
Kasigluk	109	48	17	270	0	0	0	0	0	6	1	0	0
Nunapitchuk	131	54	25	357	0	1	0	0	0	9	0	1	0
Atmautluak	69	21	17	281	0	0	0	0	0	7	0	0	0
Napakiak[b]	111	27	25	292	0	1	0	0	0	4	0	0	1
Napaskiak	116	32	73	429	0	3	0	0	0	10	0	0	2
Oscarville	21	11	3	67	0	0	0	0	0	2	0	0	0
Bethel	1,795	369	131	2,293	3	3	0	1	0	16	0	0	4
Kwethluk	182	74	29	403	3	1	1	0	0	10	0	0	0
Akiachak	177	35	41	414	1	2	0	0	0	4	0	0	0
Akiak	92	24	13	98	1	1	0	0	0	2	0	0	0
Tuluksak	105	46	18	272	3	1	0	0	0	6	0	0	0
Lower Kuskokwim River	**3,132**	**809**	**440**	**5,837**	**12**	**15**	**1**	**1**	**0**	**86**	**1**	**1**	**8**
Lower Kalskag	96	22	1	8	0	0	0	0	0	0	0	0	1
Upper Kalskag	55	16	2	12	0	1	0	0	0	0	0	0	0
Aniak	162	40	13	28	0	1	0	1	0	2	0	0	0
Chuathbaluk	30	20	3	33	1	1	0	0	0	1	0	0	0
Middle Kuskokwim River	**343**	**98**	**20**	**81**	**1**	**3**	**0**	**1**	**0**	**3**	**0**	**0**	**1**
Crooked Creek	37	25	1	3	0	0	0	0	0	1	0	0	0
Red Devil	7	4	0	0	0	0	0	0	0	0	0	0	0
Sleetmute	34	14	0	0	0	0	0	0	0	0	0	0	0
Stony River	14	4	0	0	0	0	0	0	0	0	0	0	0

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Table 3-7.–Page 2 of 2.

Community	Households			Estimated total number of salmon lost	Reason given for loss (reported)								
	Total	Surveyed	Estimated lost salmon		Animal	Disease	Equipment	Human	Personal	Weather	Other Reason	Irrelevant	No Reason
Lime Village[a]	5	–	–	–	–	–	–	–	–	–	–	–	–
McGrath[b]	94	32	0	0	0	0	0	0	0	0	0	0	0
Takotna	24	5	0	0	0	0	0	0	0	0	0	0	0
Nikolai[b]	31	21	1	44	0	0	0	0	0	1	0	0	0
Upper Kuskokwim River	**246**	**105**	**3**	**47**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**
Kuskokwim River Total[c]	**3,811**	**1,012**	**463**	**5,965**	**13**	**18**	**1**	**2**	**0**	**91**	**1**	**1**	**9**
Quinhagak	195	76	48	608	0	3	0	2	0	12	2	0	0
Goodnews Bay	83	16	0	0	0	0	0	0	0	0	0	0	0
Platinum	18	10	4	47	1	0	0	0	1	0	0	0	0
South Kuskokwim Bay	**296**	**102**	**51**	**654**	**1**	**3**	**0**	**2**	**1**	**12**	**2**	**0**	**0**
Kuskokwim Area Total	**4,107**	**1,114**	**514**	**6,619**	**14**	**21**	**1**	**4**	**1**	**103**	**3**	**1**	**9**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicated that data are unavailable.

Note Household pre-season use-group classifications were evaluated based on 2022 harvests. Twenty-one households were re-classified into higher-harvesting use groups based on 2022 harvest levels if 1) their harvest was more then two standard deviations above the mean for the strata group and 2) sampling goals for the strata group were not met. New households or households classified as having 'Unknown' harvest levels were not reclassified.

a. No surveys were conducted in these communities.

b. ANOVA means tests from use-group classification were not significant at the 95% level. Estimates were derived from a single community mean.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table 3-8.–Comments provided by survey respondents regarding whether or not their subsistence needs for salmon were met by region and subarea, Kuskokwim Management Area, 2022.

		Households				
		Number		Percentage		
Region	Salmon species	Total households	Valid responses	Needs met	No need	Needs not met
North Kuskokwim Bay[a]	Chinook		0	–	–	–
	Chum		0	–	–	–
	Sockeye	90	0	–	–	–
	Coho		0	–	–	–
	Pink		0	–	–	–
Lower Kuskokwim River	Chinook		784	41%	6%	53%
	Chum		778	32%	12%	56%
	Sockeye	3,132	783	46%	6%	48%
	Coho		779	33%	12%	55%
	Pink		765	15%	57%	28%
Middle Kuskokwim River	Chinook		96	30%	13%	57%
	Chum		97	18%	27%	56%
	Sockeye	343	97	28%	16%	56%
	Coho		97	24%	24%	53%
	Pink		96	5%	70%	25%
Upper Kuskokwim River[b]	Chinook		104	23%	18%	59%
	Chum		104	13%	39%	47%
	Sockeye	246	104	20%	33%	47%
	Coho		104	16%	35%	49%
	Pink		104	12%	63%	25%
Kuskokwim River Total[b,c]	Chinook		984	38%	8%	54%
	Chum		979	28%	16%	55%
	Sockeye	3,721	984	42%	10%	49%
	Coho		980	30%	16%	54%
	Pink		965	14%	59%	27%
South Kuskokwim Bay	Chinook		100	65%	3%	32%
	Chum		98	46%	30%	24%
	Sockeye	296	100	72%	4%	24%
	Coho		96	39%	30%	31%
	Pink		98	10%	88%	2%
Kuskokwim Area Total[b]	Chinook		1,084	41%	7%	52%
	Chum		1,077	30%	18%	52%
	Sockeye	4,017	1,084	44%	9%	46%
	Coho		1,076	31%	17%	52%
	Pink		1,063	13%	62%	25%

Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are unavailable.

a. No surveys were conducted in North Kuskokwim Bay communities

b. Percentages in subtotals only include communities where data is available.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table 3-9.–Calendars mailed and returned by community, Kuskokwim area, 2022.

Community	Calendars		
	Mailed	Returned	%
Kongiginak	0	0	–
North Kuskokwim Bay	**0**	**0**	–
Tuntutuliak	83	4	4.8%
Eek	61	6	9.8%
Kasigluk	71	0	0.0%
Nunapitchuk	80	3	3.8%
Atmautluak	43	0	0.0%
Napakiak	60	3	5.0%
Napaskiak	61	2	3.3%
Oscarville	12	0	0.0%
Bethel	588	15	2.6%
Kwethluk	100	8	8.0%
Akiachak	110	3	2.7%
Akiak	61	1	1.6%
Tuluksak	59	2	3.4%
Lower Kuskokwim River	**1,389**	**47**	**3.4%**
Lower Kalskag	47	5	10.6%
Upper Kalskag	26	3	11.5%
Aniak	87	6	6.9%
Chuathbaluk	26	1	3.8%
Middle Kuskokwim River	**186**	**15**	**8.1%**
Crooked Creek	16	1	6.3%
Red Devil	7	0	0.0%
Sleetmute	22	2	9.1%
Stony River	7	0	0.0%
Lime Village	4	0	0.0%
McGrath	43	3	7.0%
Takotna	6	0	0.0%
Nikolai	26	1	3.8%
Upper Kuskokwim River	**131**	**7**	**5.3%**
Quinhagak	135	17	12.6%
Platinum	14	1	7.1%
Goodnews Bay	50	6	12.0%
South Kuskokwim Bay	**199**	**24**	**12.1%**
Anchorage	0	1	–
Wasilla	0	1	–
Other[a]	**0**	**2**	–
Kuskokwim Area Total	**1,905**	**95**	**5.0%**

a. Calendars were mailed from the communities listed in the table; however, the community of residence of their senders is unknown.

In the middle Kuskokwim River, 18% of surveyed households achieved their chum salmon harvest goals and 56% did not. Although the middle Kuskokwim River community of Aniak had the lowest percentage of households that met their chum salmon harvest goals (5%), the community also had the highest percentage of households in the middle river section that expressed no need for chum salmon (35%). The primary reasons for middle Kuskokwim River households that did not achieve their chum salmon harvest goals were personal reasons, run dynamics, and equipment issues.

Thirteen percent of upper Kuskokwim River households met their chum salmon harvest goals, 47% of households did not, and 39% indicated that they had no need for chum salmon. Stony River was the only upper river community to obtain at least 50% of their household chum harvest goals, and the remaining communities all fell at or below one quarter. Additionally, Takotna reported that no households achieved their chum salmon harvest goals in 2022. Upper Kuskokwim River households that did not achieve their chum harvest goals cited management decisions, followed by personal reasons, and not fishing as to why they were unable to meet their harvest goals.

For south Kuskokwim Bay communities, 46% of households achieved their chum salmon harvest goals and 24% did not. In addition, 30% of households expressed no need for chum salmon. Quinhagak (52%) had the highest percentage of households that achieved their chum salmon harvest goals, while Goodnews Bay (23%) had the lowest percentage. Platinum (60%) had the highest percentage of households that expressed no need for chum salmon. The most commonly cited reasons for households that did not achieve their chum salmon harvest goals were personal reasons, followed by did not fish, and expenses.

Sockeye Salmon

Across the KMA, households that met—and did not meet—their sockeye salmon harvest goals were roughly equal. Based on responses from 1,084 household respondents, 44% of households achieved their sockeye salmon harvest goals in 2022, while 46% of households did not (Table 3-8). For the households that did not reach their harvest goals for sockeye salmon, the most common responses were personal reasons followed by management actions and equipment issues. In addition, 9% of households indicated that they had no need for sockeye salmon.

Nearly one-half (46%) of lower Kuskokwim River households achieved their sockeye salmon harvest goals, while less than one-third did so in the middle and upper Kuskokwim River (Table E3). The most common responses cited by lower and middle Kuskokwim River households that did not meet their sockeye salmon harvest goals were personal reasons, management actions, and equipment issues. For upper Kuskokwim River communities, the most common responses were personal reasons, management decisions, and did not fish.

In the lower Kuskokwim River, the community of Napaskiak (65%) had the highest percentage of households that achieved their harvest goals, and Tuluksak (72%) had the highest percentage of households that did not achieve their harvest goals. In the middle Kuskokwim River, the communities of Upper Kalskag (63%) and Chuathbaluk (32%) had the highest percentages of households that met their sockeye salmon harvest goals, and Lower Kalskag (77%) had the highest percentage of households that did not achieve their harvest goals. In the upper portion of the drainage, Stony River (50%) and Sleetmute (36%) had the highest percentages of households that achieved their sockeye salmon harvest goals, and McGrath (59%) had the highest percentage of households that did not. In south Kuskokwim Bay communities, 72% of households achieved their sockeye salmon harvest goals. Goodnews Bay (80%) reported the highest percentage of sockeye harvest goals met in the study area. Similar to responses from lower, middle, and upper Kuskokwim River households, south Kuskokwim Bay households that did not meet their sockeye salmon harvest goals most frequently cited personal reasons, did not fish, and equipment issues. Harvest patterns and abundance vary by location and residents of the lower river communities generally have greater access to all five species of salmon throughout their respective runs. Residents in the middle and upper river communities are faced with the challenges of both reduced abundance and access, as well as the quality of fish harvested.

Coho Salmon

Across the KMA, 1,076 respondents provided valid responses to researchers when asked if their households were able to achieve their coho salmon harvest goals in 2022 (Table 3-8). More than one-third (31%) of households achieved their harvest goals for coho salmon, and over half (52%) did not. Common responses among households that did not achieve their coho salmon harvest goals included personal reasons, management actions, and equipment issues. In addition, 17% of households expressed no need for coho salmon.

Thirty-three percent of surveyed lower Kuskokwim River community households achieved their household harvest goals for coho salmon in 2022 (Table E4). Lower Kuskokwim River communities with the highest percentages of households that achieved their harvest goals were Akiachak (41%), Bethel (40%), and Nunapitchuk (36%). Lower Kuskokwim River communities with the highest percentages of households that did not achieve their harvest goals were Akiak (75%), Kwethluk (65%), and Tuluksak (65%). Sixteen percent of surveyed middle Kuskokwim River community households achieved their harvest goals for coho salmon in 2022. The middle Kuskokwim River community of Upper Kalskag had the highest percentage (56%) of households that achieved their coho salmon harvest goals in that region, and Lower Kalskag reported that no households achieved their harvest goals. Lower Kalskag also had the highest percentage (36%) of households that expressed no need for coho salmon. In the upper Kuskokwim River region, sixteen percent of community households achieved their household harvest goals for coho salmon in 2022. The community of Stony River had the highest percentage (50%) of households that achieved their harvest goals, nearly half of all surveyed households. In contrast, of the 25 surveyed households in Crooked Creek, only 13% met their harvest goals for coho salmon. Lastly, 39% of south Kuskokwim Bay community households achieved their coho salmon harvest goals, but 31% did not. Quinhagak and Platinum had the highest percentage of households that achieved their harvest goals, whereas Goodnews Bay had the lowest percentage of households that achieved their harvest goals.

Pink Salmon

Over 1,000 respondents provided valid responses to researchers when asked if their households were able to achieve their pink salmon harvest goals in 2022 (Table 3-8). Of the 1,063 responses, 659 (62%) indicated no need for pink salmon. For those respondents who did not meet their pink salmon harvest goals, the most common responses were personal reasons, management decisions, and equipment issues.

Harvest Calendars

In 2022, ADF&G staff sent 1,905 subsistence harvest calendars to Kuskokwim River drainage and south Kuskokwim Bay area households (Appendix C). Some survey respondents use the calendars to aid them in their memory of their harvests during survey administration. A total of 95 calendars were returned to ADF&G offices (Table 3-9).

Local Comments

At the end of each survey, respondents were asked to share comments or concerns they had to ADF&G staff. Responses gathered in this final portion of the survey were qualitative in nature.

Lower River

Numerous household respondents from several different lower Kuskokwim River communities expressed concerns about management actions. These included comments about too few fishing opportunities (“openers”), openers coinciding with poor drying weather, and crowded conditions during openers. Several respondents also expressed concerns about commercial bycatch in the high seas and indicated that poor Chinook and chum salmon returns are directly related to bycatch. Many respondents commented on high fuel and gear prices influencing community fishing opportunities. A few respondents commented on the poor chum salmon return, and a small number of respondents expressed satisfaction with their household harvests.

Middle River

Comments shared by household respondents living in middle Kuskokwim River communities were similar in nature to those shared by lower Kuskokwim River respondents. These included comments about management actions: specifically, the need for more fishing opportunities. Several respondents also expressed concerns about low chum salmon numbers, and three respondents suggested that high seas commercial bycatch was responsible for poor returns.

Upper River

Comments from respondents living in upper Kuskokwim River communities were similar to those shared by lower and middle Kuskokwim River respondents. Several respondents also expressed concerns about low numbers of salmon. Some respondents also commented on the fishing schedule and requested that the lower portion of the river be closed prior to the middle and upper portions. Some respondents added that closing the lower portion of the river allows the fish to pass and be more readily available for harvest in the middle and upper portions. Four respondents suggested that high seas commercial bycatch was responsible for poor returns. Other respondents indicated that they had had a good fishing season.

South Kuskokwim Bay

Several household respondents in south Kuskokwim Bay communities shared concerns about commercial fishing bycatch in the Bering Sea and the effect it may have on salmon runs in local rivers. Several respondents said that Chinook salmon were physically small in size in 2022 and that the run was weak. Respondents also commented about the need for commercial fishing opportunities be more closely monitored.

The most common themes expressed by residents in the Kuskokwim drainage in 2022 included concerns about management decisions, low salmon numbers, and high seas commercial fishing bycatch.

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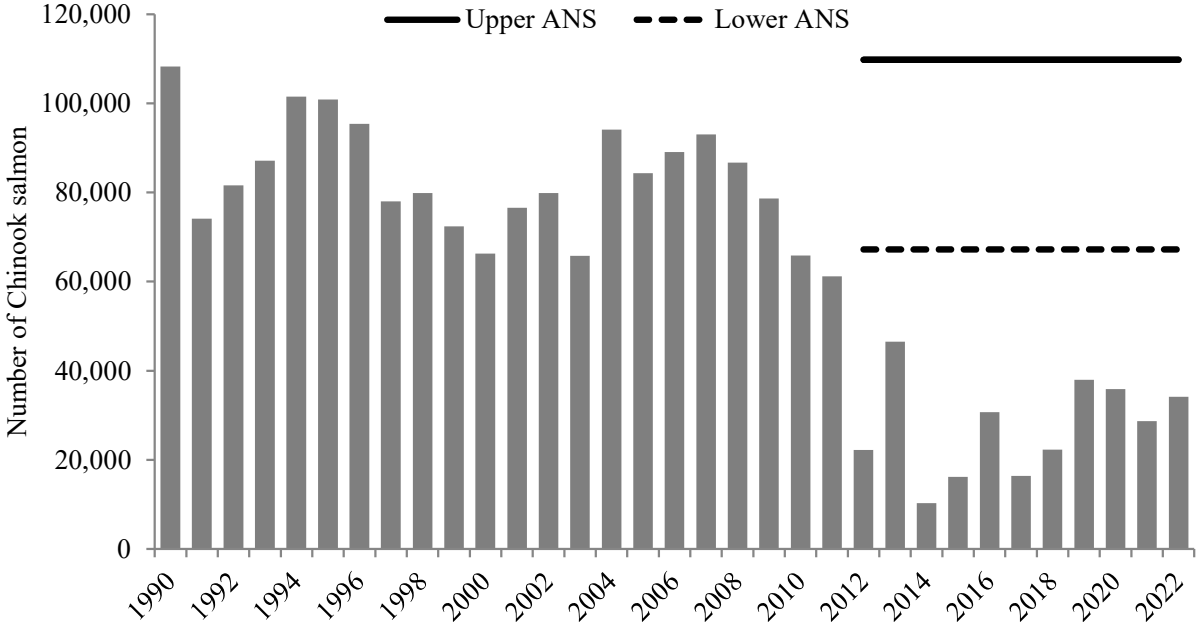
4. DISCUSSION

Historical Harvest Estimates

Subsistence salmon fishers throughout the Kuskokwim River drainage have experienced considerable harvest declines over the past three decades; the most substantial declines began in 2012. Every region of the river has been affected by this trend. Although most communities have experienced substantial decreases in Chinook salmon harvests, the harvests of other salmon species have also declined for many families. Previous division reports have documented these changes in the fishery, as well as the effects of these changes on families living throughout the Kuskokwim River drainage. For more detailed information, refer to Godduhn et al. (2020), as well as Runfola et al. (2019), Ikuta et al. (2016), and Brown et al. (2013).

Historical subsistence harvest estimates of Chinook salmon indicate that harvests have declined throughout the entire surveyed portion of the KMA following a high harvest of over 114,000 Chinook salmon in 1990 (Figure 4-1; Table A1). Harvest averages for Chinook salmon during the period 1990 to 2022 have consistently decreased over time. The 2000 season marked the first time on record that the run size fell below 150,000 Chinook salmon. As a result, the State of Alaska declared an economic disaster on the Kuskokwim River (Lipka and Tiernan 2018). Slightly over 71,000 Chinook salmon were harvested for subsistence in 2000, and many fishers were not able to reach their Chinook salmon harvest goals. In response, ADF&G implemented a conservative subsistence fishing schedule in 2001 in an attempt to improve escapement while also providing limited subsistence fishing opportunities (Burkey, Jr. et al. 2002). In addition, federal and state management agencies along with several local Alaska Native tribal organizations issued a drainagewide "joint appeal for subsistence users to conserve Chinook" salmon in 2001 (Burkey, Jr. et al. 2002:106). Harvest decreases continued into the 2014 season, which marked the lowest Chinook salmon subsistence harvest on record for Kuskokwim River subsistence fishers. (Figure 4-1; Table A1).



Amounts reasonably necessary for subsistence (ANS) established by the Alaska Board of Fisheries, 2013 (05 AAC 01.286(b)).

Figure 4-1.–Estimated Chinook salmon subsistence harvests,1990–2022, and ANS range 2012–2022, Kuskokwim River.

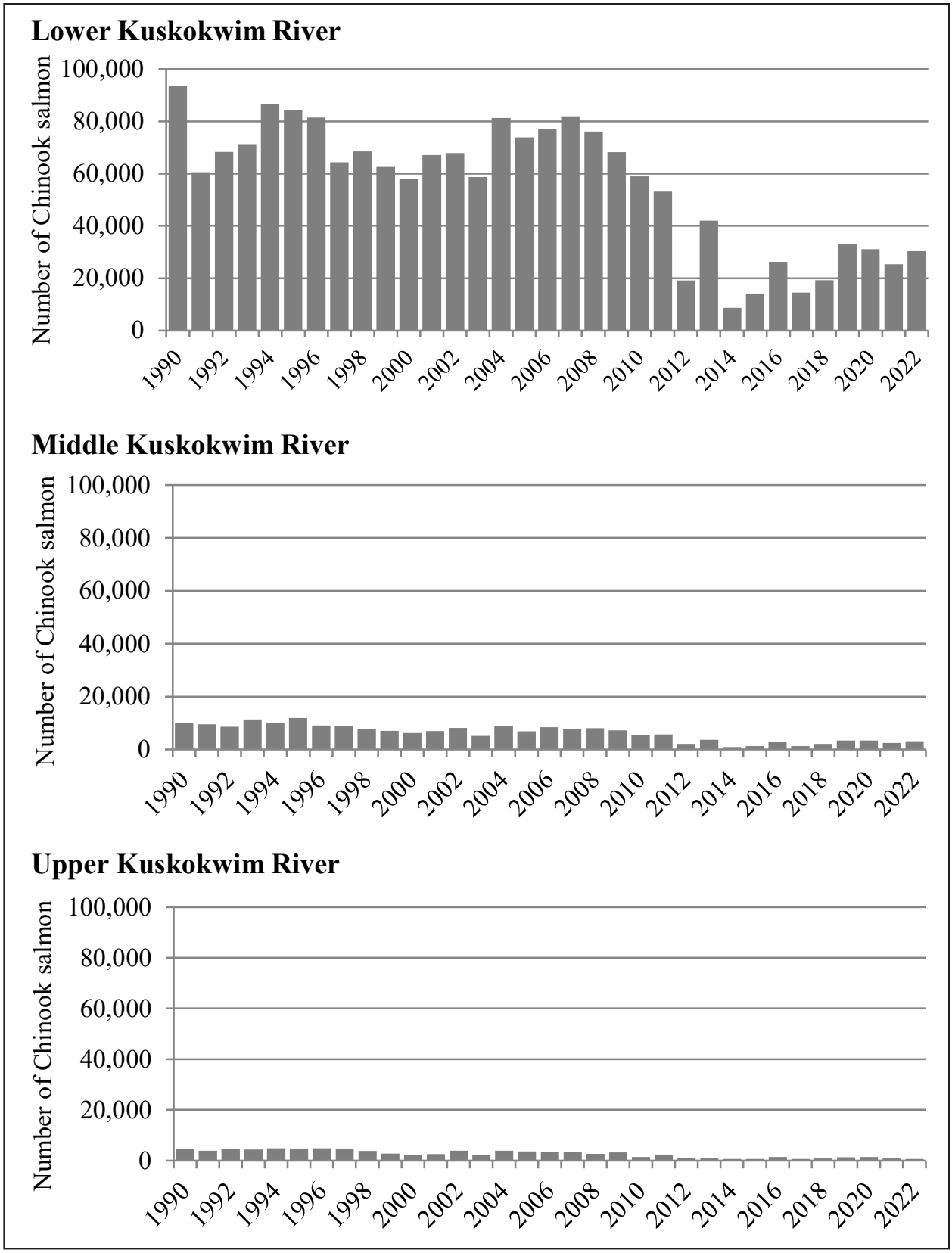


Figure 4-2.–Estimated Chinook salmon subsistence harvests by subarea, Kuskokwim River, 1990–2022.

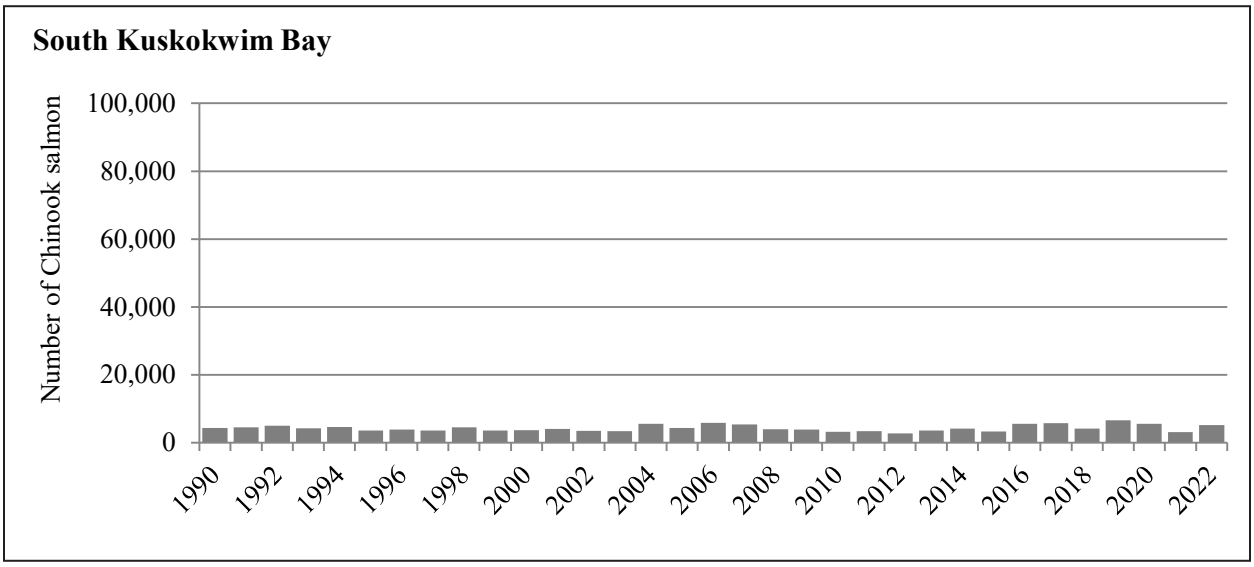


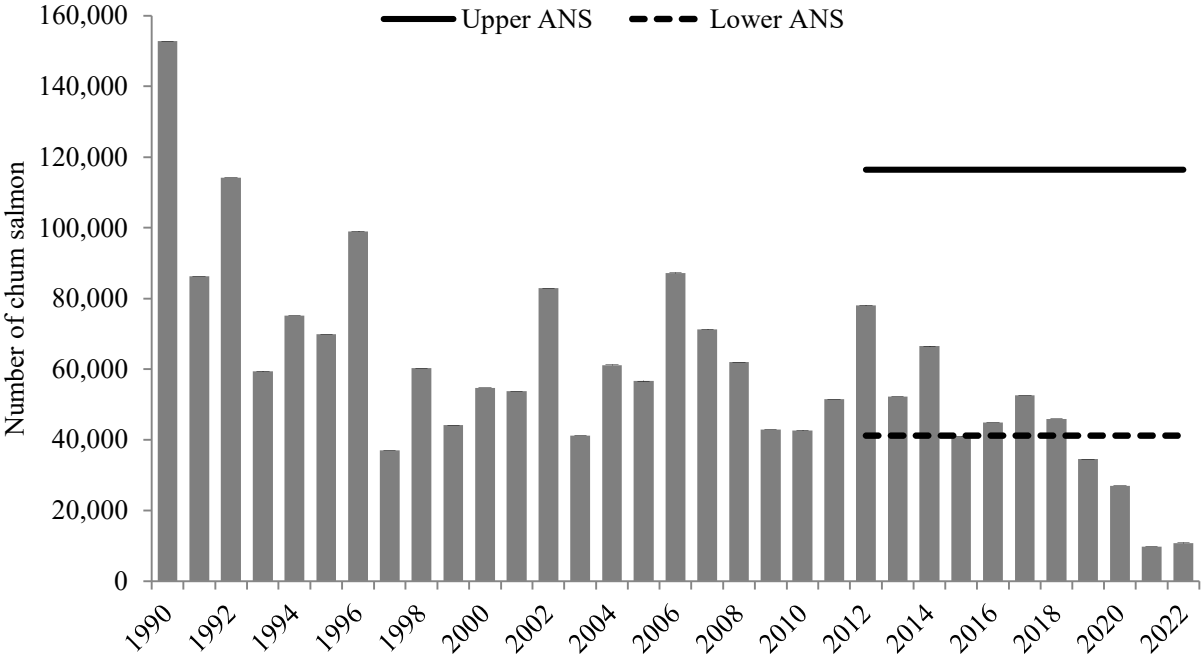
Figure 4-3.–Estimated Chinook salmon subsistence harvests, Kuskokwim Bay, 1990–2022.

Historical 5-year and 10-year averages of Chinook salmon harvest were significantly higher prior to the sharp decline that began in 2012 (Table A1). For example, in 2001, the Kuskokwim Area 5-year average was 79,855 fish and the 10-year average was 89,245 fish. During the year preceding the decline (2011) the Kuskokwim Area 5-year average was 85,877 Chinook salmon and the 10-year average was 82,708 Chinook salmon harvested. By comparison, in 2022, the Kuskokwim Area 5-year average was 36,752 Chinook salmon and the 10-year average was 32,776 Chinook salmon. The percent changes (decrease) between the 2011 and 2022 5-year harvest and 10-year harvest averages of Chinook salmon were approximately 57% and 63%, respectively.

In 2022, the Kuskokwim Area total Chinook salmon harvest was higher than both the 5-year and 10-year averages of the same year (Table A1). Three out of the four regional averages, in the lower Kuskokwim River, middle Kuskokwim River, and south Kuskokwim Bay, reflect that the Chinook salmon harvests were also higher than both the 5-year and 10-year averages. However, these figures are also representative of a general declining harvest trend that has been observed for many years. The upper river region had no communities that surpassed either the 5-year or the 10-year averages. However, at the community level, only 11 out of the 27 surveyed communities achieved higher harvests than both the 5-year and 10-year averages in 2022.

During the 2022 season, the pattern of very low Chinook salmon harvests in Kuskokwim River communities continued from previous seasons dating back to 2012 (Table A1). The 2022 drainagewide Chinook salmon harvest (39,335) was greater than the 2021 harvest (31,837), but the 2022 harvest number was significantly lower than historical harvest data prior to 2012. At the regional level, the 2022 south Kuskokwim Bay, lower, and middle Kuskokwim River Chinook salmon harvests were slightly greater than the regions' 5- and 10-year average harvests, whereas the upper Kuskokwim River Chinook salmon harvest was considerably lower than the region's 5- and 10-year averages. However, the harvests for each region still remained far below historical harvest levels prior to the Chinook salmon crash in 2012. At the community level, only 9 of the 27 surveyed communities' 2022 Chinook salmon harvests were less than their 2021 harvests, but most of the communities minimally exceeded their 2021 harvests. Figures 4-2 and 4-3 show Chinook salmon harvests by subarea.

Kuskokwim River area chum salmon subsistence harvests have also declined since 1990 (figures 4-4 and 4-5; Table A2). Similar to Chinook salmon harvests, chum salmon harvests included several high harvests during the period 1990–1999, when the average harvest was close to 83,000 fish. However, this period also included the fourth lowest chum salmon harvest on record, in 1997 (38,477 fish). Increased fishing



Amounts reasonably necessary for subsistence (ANS) established by the Alaska Board of Fisheries, 2013 (05 AAC 01.286(b)).

Figure 4-4.–Estimated chum salmon subsistence harvests, 1990–2022, and ANS ranges, 2012–2022, Kuskokwim River.

restrictions and low run abundance may have contributed to the overall chum salmon harvest decline among Kuskokwim River communities over the period 1990–2022. Many Kuskokwim River drainage area residents and local organizations attribute poor chum salmon returns to bycatch associated with high seas, large-scale, commercial fishing operations.[1] Chum salmon run concurrently with Chinook salmon each season. As a result, restrictions in place to protect Chinook salmon stocks directly affect fishers' ability to harvest chum salmon.

Historical 5-year and 10-year averages of chum salmon harvest were significantly higher prior to the decline that began in 2012. In 2011, the Kuskokwim Area 5-year average was 58,278 chum salmon and the 10-year average was 64,153 chum salmon harvested (Table A2). By comparison, in 2022, the Kuskokwim Area 5-year average was 27,012 chum salmon and the 10-year average was 40,384 chum salmon (Table A2). The percent changes (decrease) between the 2011 and 2022 5-year harvest and 10-year harvest averages of chum salmon were approximately 54% and 37%, respectively.

The 2022 chum salmon harvest (12,844) represented a 20% increase compared to the 2021 harvest and was the second lowest recorded drainagewide harvest since ADF&G started estimating harvests in 1990 (Table A2). Since 1990, four of the five record low harvests (<39,000 fish) have occurred during the past four seasons. Lower, middle, and upper region-level harvests were significantly below each region's 5- and

1. Kim, G. 2022. Federal government denies tribal groups' petition to limit salmon bycatch. KYUK, Bethel. Accessed May 16, 2022. https://www.kyuk.org/hunting-fishing; Smiley, Sage. 2022. Bycatch task force works to refine mission ahead of November deadline. KTOO, Juneau. Accessed June 2, 2022. https://www.ktoo.org/2022/02/18/bycatch-task-force-works-to-refine-mission-ahead-of-november-deadline/; State of Alaska, Office of Governor Mike Dunleavy. 2021. Governor Dunleavy Forms Task Force to Review Bycatch. Juneau. Accessed June 2, 2022. https://gov.alaska.gov/newsroom/2021/11/18/governor-dunleavy-forms-task-force-to-review-bycatch/; Kim, G., 2021. Kuskokwim River Salmon Management Working Group tackles trawler salmon bycatch. KYUK, Bethel. Accessed May 16, 2022. https://www.kyuk.org/hunting-fishing

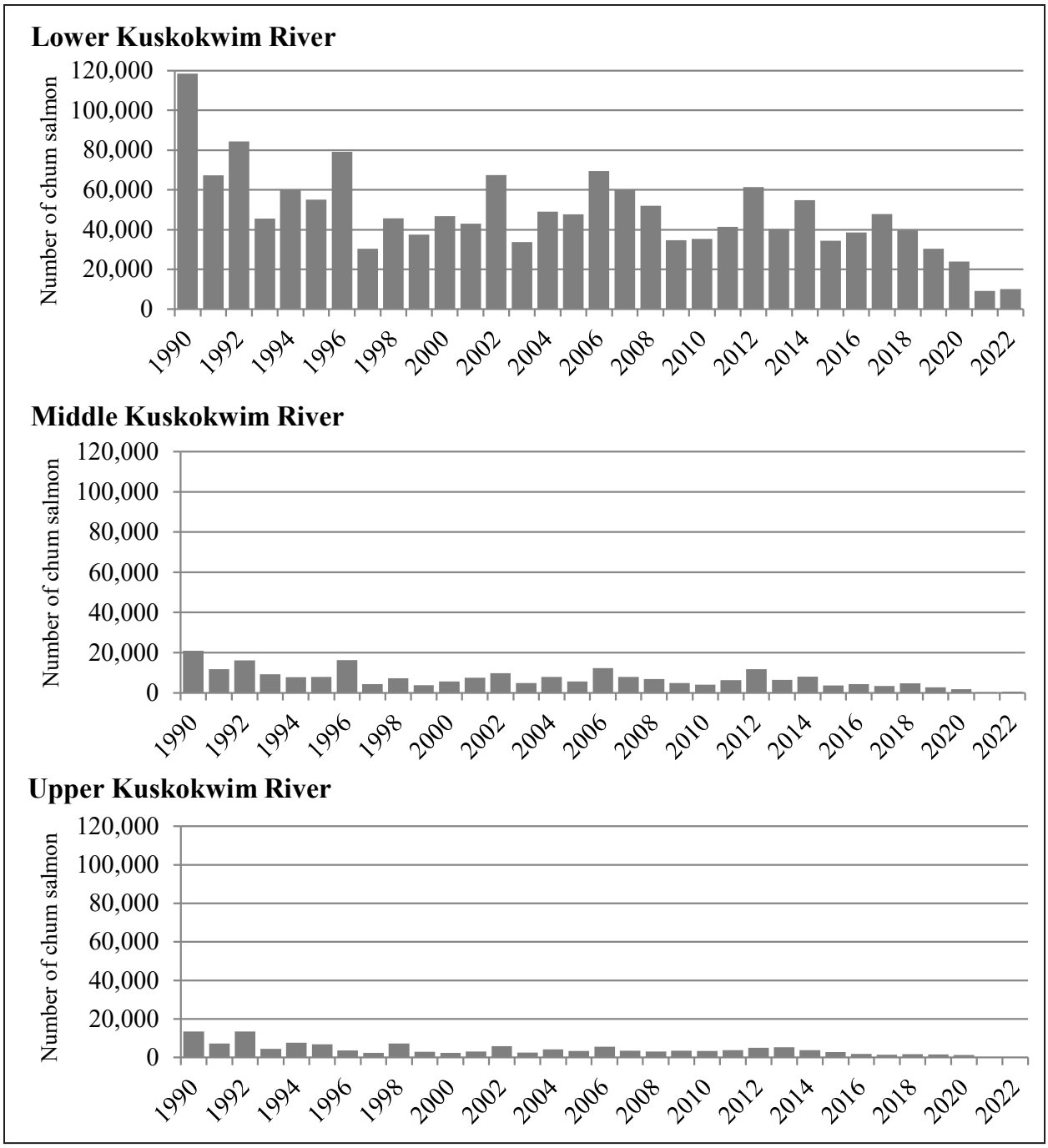
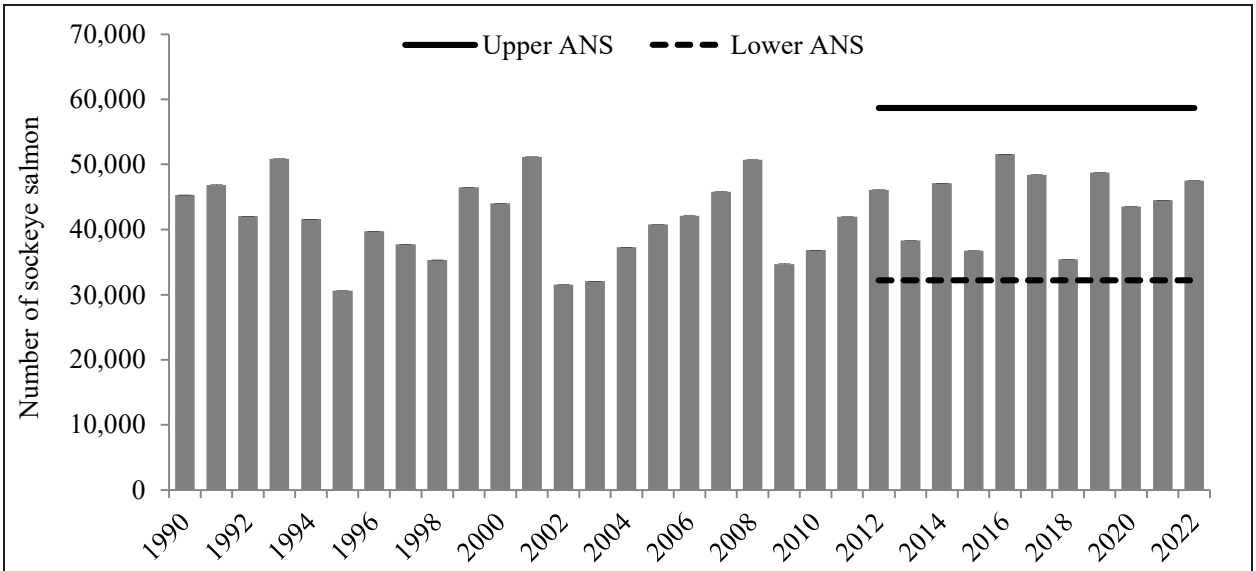


Figure 4-5.–Estimated chum salmon subsistence harvests by subarea, Kuskokwim River, 1990–2022.



Amounts reasonably necessary for subsistence (ANS) established by the Alaska Board of Fisheries, 2013 (05 AAC 01.286(b)).

Figure 4-6.–Estimated sockeye salmon subsistence harvests, 1990–2022, and ANS range, 2012–2022, Kuskowkim River.

10-year average harvests, however, South Kuskokwim Bay region was above their region's 5- and 10-year average harvests. All but 3 of the 27 surveyed communities fell below their communities' 5- and 10-year average chum harvest and 18 of the 27 surveyed communities' chum salmon harvests were 50% or more below their 5-year average harvest: for example, the Kuskokwim River communities of Nikolai, Stony River, Sleetmute, and Red Devil all reported no chum salmon harvest in 2022 (Table A2).

Overall, Kuskokwim River drainage area sockeye salmon subsistence harvests have remained relatively stable for the period 1990–2022 (figures 4-6 and 4-7; Table A3). The annual harvest for the same period averaged over 46,093 sockeye salmon.

Historical 5-year and 10-year averages of sockeye salmon harvest have slightly increased for the period 1990–2022. In 2022, the 5-year average was 48,814 and the 10-year average was 48,687 sockeye salmon harvested (Table A3). In 2011, the 5-year and 10-year averages were 46,525 and 43,633, respectively (Table A3). The percent changes (increase) between the 2011 and 2022 5-year harvest and 10-year harvest averages of sockeye salmon were approximately 5% and 12%, respectively.

The total drainagewide 2022 sockeye salmon harvest was slightly greater than the 2021 harvest as well as the most recent 5- and 10-year averages (Table A3). On the regional level, lower Kuskokwim River and south Kuskokwim Bay community sockeye salmon harvests exceeded their regions' 5- and 10-year average harvests, but middle and upper Kuskokwim River community harvests fell considerably below their region's 5- and 10-year averages. Over 40% of the surveyed communities' sockeye salmon harvests increased in 2022 compared to 2021. For these communities, increased harvests may have been in response to low Chinook and chum salmon harvests.

Historical subsistence harvest estimates for coho salmon indicate that harvests have gradually decreased at the drainage level during the period 1990–2022 (Figure 4-8; Table A4). Harvest decreases for coho salmon may be attributed to several factors, including low abundance or less fishing effort targeting the species. Because coho salmon are the last species to enter the river, restrictions associated with Chinook salmon and other salmon species generally do not affect fishers' abilities to harvest coho salmon. Figure 4-9 shows coho salmon harvests by subarea.

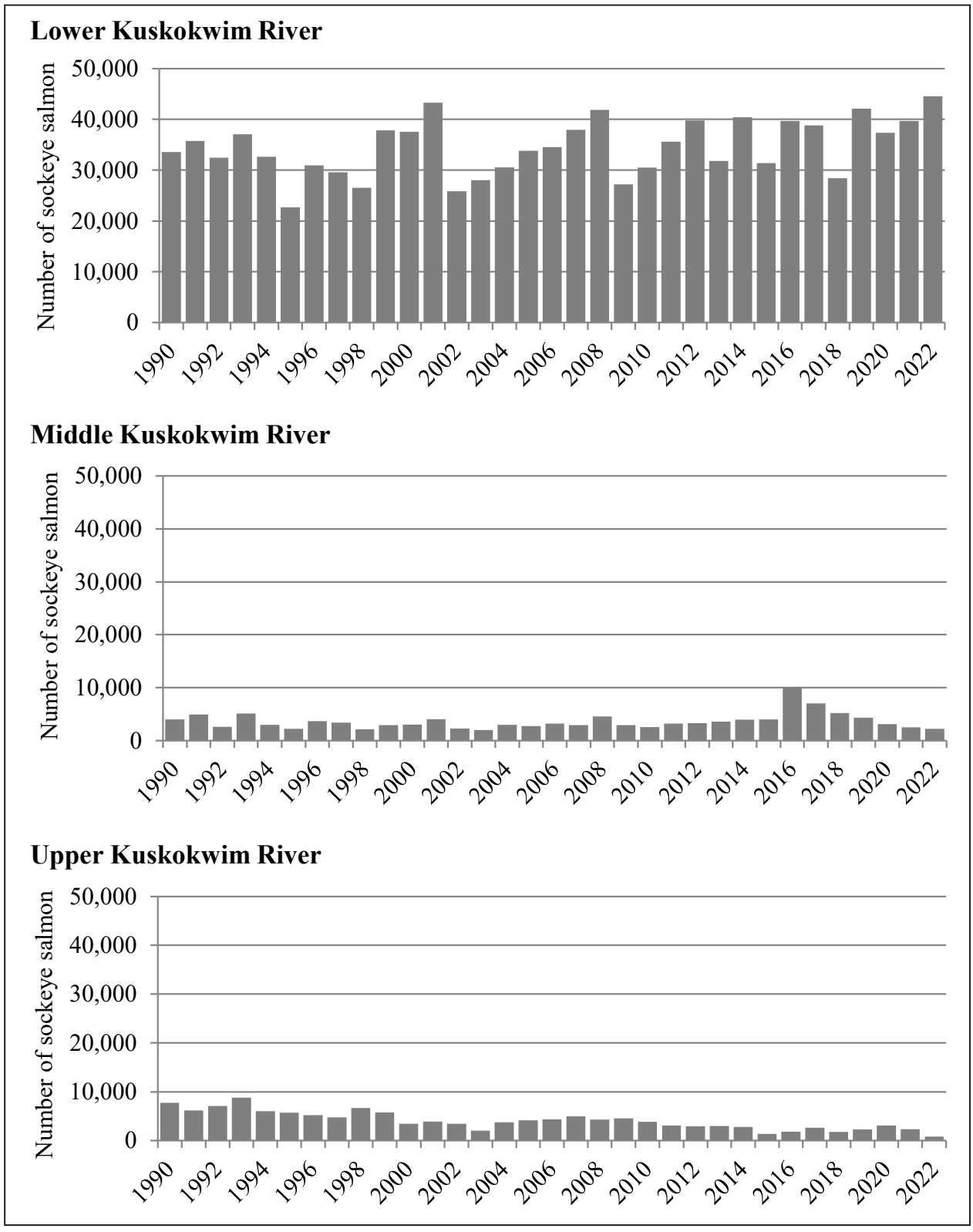


Figure 4-7.–Estimated sockeye salmon subsistence harvests by subarea, Kuskokwim Rier, 1990–2022.

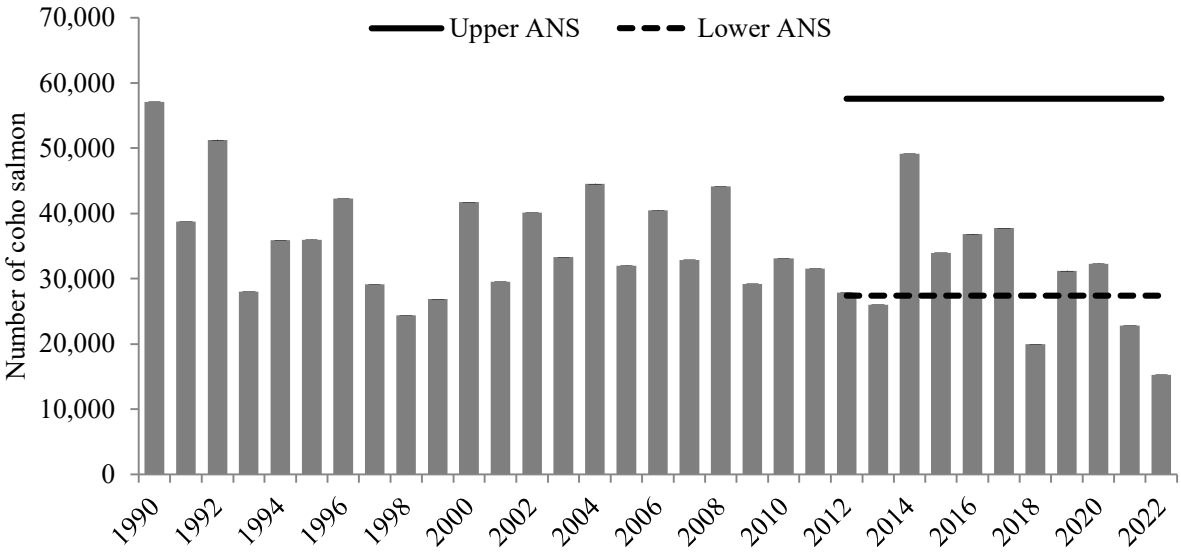


Figure 4-8.–Estimated coho salmon subsistence harvests, 1990–2022, and ANS range, 2012–2022, Kuskokwim River.

Historical 5-year and 10-year averages of coho salmon harvest have also decreased. In 2022, the 5-year average was 26,190 and the 10-year average was 32,767 coho salmon harvested (Table A4). In 2011, the 5-year and 10-year averages were 36,987 and 39,149 fish, respectively (Table A4). The percent changes (decrease) between the 2011 and 2022 5-year harvest and 10-year harvest averages of coho salmon were approximately 29% and 16%, respectively. The drainagewide 2022 coho salmon harvest was the lowest on record dating back to 1990, and both lowest harvest seasons occurred within the past five years. The 2022 harvest was considerably less than the drainage's 5- and 10-year averages (Table A4) and represented a 30% decrease compared to 2021. Harvests among all regions of the river, including south Kuskokwim Bay, were less than each region's 5- and 10-year average harvests. At the community level, 18 of the 27 surveyed communities fell below their 5-year average harvests, and Nikolai and Red Devil reported no coho salmon harvest.

Amounts Reasonably Necessary for Subsistence

As mentioned in the Introduction chapter of this report, the BOF revised ANS levels for the KMA in 2013 (Table 4-1). The current ANS ranges for the Kuskokwim River drainage are as follows: 67,200–109,800 Chinook, 41,200–116,400 chum, 32,200–58,700 sockeye, 27,400–57,600 coho, and 500–2,000 pink salmon (5 AAC 01.286(b)).[2]

The 2022 subsistence Chinook salmon harvest represented the twelfth consecutive season when harvest levels fell below the lower range of the ANS for the Kuskokwim River drainage. The drainagewide harvest of Chinook salmon has not exceeded the lower bound of the ANS range since 2010. Similar to 2021, the 2022 chum salmon harvest also fell far below the lower bound of its respective ANS range for the fourth consecutive season since ANS levels were revised in 2013.

The 2022 coho salmon harvest fell far below the lower range of the ANS for the Kuskokwim River drainage and had the lowest harvest since ANS ranges were first specified in 1993.

2. These ANS ranges are specific to the Kuskokwim River drainage proper. A separate ANS range exists for communities in District 4 (south Kuskokwim Bay) and District 5 (Goodnews Bay). The ANS range for these areas combined is 6,900–17,000 salmon (all species).

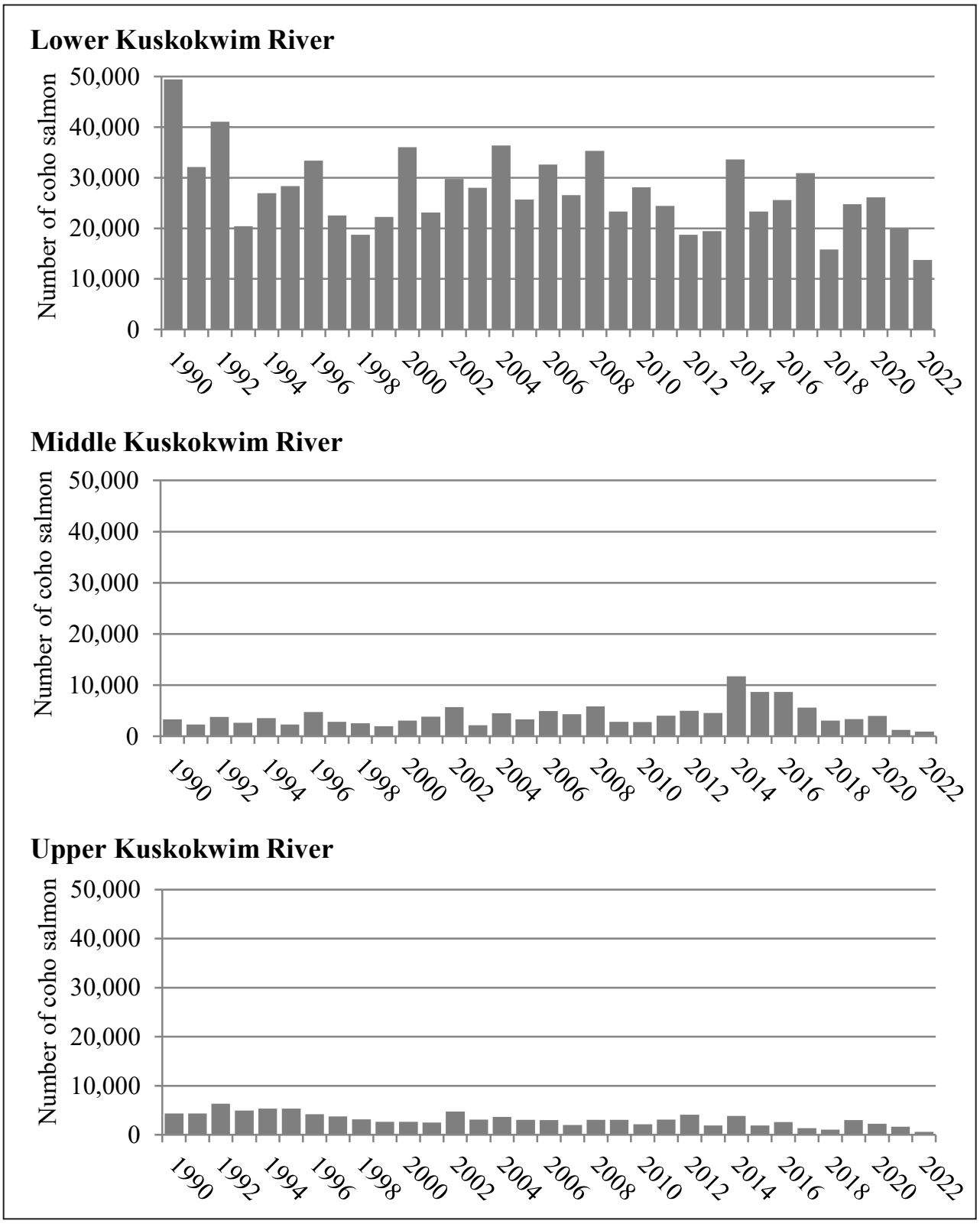


Figure 4-9.–Estimated coho salmon subsistence harvests by subarea, Kuskokwim River, 1990–2022.

Table 4-1.–Amounts necessary for subsistence (ANS) and estimated subsistence salmon harvests, Kuskokwim River drainage, 1990–2022.

	Estimated salmon harvest					
Year[a]	Chinook	Sockeye	Coho	Chum	Pink	All salmon
1990	108,219	45,345	57,086	152,816	--	363,466
1991	74,091	46,872	38,762	86,259	--	245,984
1992	81,552	42,070	51,231	114,164	--	289,017
ANS Range[b]	Chinook	Sockeye	Coho	Chum	Pink	All salmon 192,000–242,000
1993	87,150	50,872	28,010	59,342	--	225,374
1994	101,536	41,639	35,896	75,174	--	254,245
1995	100,826	30,632	35,986	69,877	--	237,321
1996	95,369	39,777	42,275	99,023	--	276,444
1997	77,958	37,714	29,135	37,017	--	**181,824**
1998	79,841	35,312	24,407	60,261	--	199,821
1999	72,385	46,510	26,899	44,202	--	189,996
2000	66,311	44,032	41,757	54,641	--	206,741
ANS Range[c]	Chinook 64,500–83,000	Sockeye 27,500–39,500	Coho 24,500–35,000	Chum 39,500–75,500	Pink	All salmon
2001	76,562	51,179	29,546	53,792	--	211,079
2002	79,820	31,533	40,139	82,916	--	234,408
2003	65,734	32,044	33,295	41,185	--	172,258
2004	94,125	37,318	44,513	61,182	--	237,138
2005	84,327	40,782	32,015	56,595	1,298	215,017
2006	89,083	42,113	40,518	87,254	2,174	261,142
2007	93,033	45,856	32,883	71,207	1,222	244,201
2008	86,679	50,711	44,167	62,034	1,022	244,613
2009	78,653	34,729	29,206	42,904	535	186,027
2010	65,830	36,866	33,097	42,567	558	178,918
2011	**61,158**	41,979	31,559	51,507	706	186,909
2012	**22,257**	46,089	27,844	77,994	2,002	176,186
ANS Range[d]	Chinook 67,200–109,800	Sockeye 32,200–58,700	Coho 27,400–57,600	Chum 41,200–116,400	Pink 500–2,000	All salmon
2013	**46,472**	38,351	**25,997**	52,230	650	163,700
2014	**10,270**	47,142	49,175	66,484	2,551	175,622
2015	**16,124**	36,781	33,939	**40,872**	1,168	128,884
2016	**30,693**	51,580	36,816	44,881	4,351	168,321
2017	**16,380**	48,462	37,786	52,589	2,098	157,315
2018	**22,264**	35,448	**19,981**	45,918	1,695	125,306
2019	**37,940**	48,745	31,167	**34,568**	864	153,284
2020	**35,868**	43,531	32,324	**26,992**	866	139,581
2021	**28,643**	44,534	**22,808**	**9,759**	742	106,486

-continued-

Year[a]	Estimated salmon harvest					
	Chinook	Sockeye	Coho	Chum	Pink	All salmon
2022	**34,153**	47,528	**15,241**	**10,825**	923	108,670

Source ADF&G Division of Subsistence, ASFDB 2022 (ADF&G 2022).

a. ANS ranges did not exist for the Kuskokwim River subsistence salmon fishery prior to 1993.

b. In 1993, ANS options were first specified for all salmon in the Kuskokwim River drainage.

c. In 2001, species-specific ANS determinations were made for all species of salmon, except for pink salmon, due to lack of available data.

d. In 2013, ANS determinations for the drainage were revised, and an ANS determination was made for pink salmon.

-- Data not available.

The 2022 sockeye salmon harvest was within its ANS range for the tenth consecutive season since ANS levels were revised in 2013.

Comparison of Needs Met

Regional differences in the harvest patterns may be reflected throughout the historic and contemporary harvest numbers for all species of salmon. For example, subsistence fishers in south Kuskokwim Bay and lower river communities have the first opportunity to harvest Chinook salmon, chum, sockeye, coho, and pink salmon at the beginning of their spawning migration, during a time when the fish are in peak condition. As the run proceeds to the middle and upper river regions, the abundance, availability, and quality of harvested fish are reduced. This naturally occurs as body condition degrades through their migration and many salmon will have either left the mainstem for their spawning grounds in the lower river or have been removed via harvest or predation.

Run dynamics vary between river locations as well as well. Sockeye salmon spawn in the pebbled lakes and streams of the lower and middle Kuskokwim River, but do not travel beyond Stony River. As a result, some communities in the middle river and all upper river communities do not have access to all five species of salmon, and instead focus their harvest on Chinook, chum, and coho salmon.

River morphology should also be considered when looking at the variable harvest numbers in the different areas of the Kuskokwim River. The lower river section of the Kuskokwim River consists of wide sandbars, braided channels, and tidal influences. In contrast, the upper river is more narrow and not influenced by the tides, making its general characteristics more consistent than the lower river region. Harvest site selection and gear type are influenced by these factors. For example, many lower river fishers primarily use driftnets to specifically target salmon near cutbanks, sandbars, braided channels, and confluences. Because the Kuskokwim River's substrate and morphology vary so widely, each region uses a type of fishing gear that will best allow fishers to meet their salmon harvest needs. The driftnet floats alongside a boat as it drifts downstream, harvesting fish as they swim against the current into the net. Driftnets allow fishers to explore fishing locations in the ever-changing channels of the area and allow them greater control in harvesting salmon as they can reposition to suit the changing tides and river morphology. However, nets can be cost-prohibitive, sometimes costing up to one-thousand dollars per net. Subsistence fishers are often protective of their nets and are careful to maintain the gear that allows them to feed their families throughout the winter. In contrast, because of its narrow width and lack of tidal influence, middle and upper river fishers often maintain fish wheels, which are stationary in the river and do not require flexibility in harvest location, because these channels rarely shift far enough within a season to require relocation of the wheel. Fishers in these regions will also use setnets or rod and reel as opposed to driftnet gear.

In addition to environmental and migratory conditions, local socio-economic factors influence harvest. The local economy may also vary by both region and community. The lower river communities, including Bethel, represent approximately 80% of the total population of the KMA (Table 1-2). This region tends to have larger communities which are closer together with better employment infrastructure due to community size. The south Kuskokwim Bay region (7% of the total KMA human population), the middle river region (8%) and the upper river region (4%), contain smaller communities which are more geographically spread out and generally have fewer employment opportunities (Table 1-2). Boats are the key to success for fishers throughout the KMA and repair and maintenance ensure a fisher has access to fishing locations throughout the season. However, access to repair services, parts, skilled labor, and gear isn't always easy, especially in smaller communities of the KMA. This is especially critical during limited fishing openers, or when fishers need to take advantage of specific salmon run timing, weather opportunities, or work schedules.

The current regulatory structure which implements openings and closures on the mainstem of the Kuskokwim River has implications for the harvest levels and efficiency of all Kuskokwim River fishers. Scheduled openings and closures force fishers to participate in a rushed, derby-like environment to ensure that they harvest enough salmon to fulfill their households' needs. Most fishers focus fishing efforts on tidal influences to successfully harvest salmon, which creates an additional time constraint on top of the schedule of openers. Furthermore, channels and cut banks are strategically targeted locations, so many residents will try to arrive at these locations early in the day and, in turn, preempt other users from fishing at these locations. Opening and closure schedules have resulted in increased competition for productive fishing locations, hastened fishing activities, and increased the volume of boat traffic on the river during open fishing periods.

Further complicating harvest opportunity, weather throughout the KMA is unpredictable and may be inclement during any fishing opener. Fishing during inclement weather reduces visibility on a river congested with boat traffic. Due to these reasons, some residents opt to reduce or avoid fishing during openers to mitigate the risks associated with the regulatory structure. In summary, the combined issues stated above reduce salmon harvest for residents of the KMA. In addition to lower harvests, residents have expressed concerns regarding the processing and preservation of salmon harvests. Many residents still maintain fish camps where families and groups of friends harvest fish and collectively share in the processing and preservation processes. Many residents have described that the ability to fish under fairer weather forecasts is imperative to processing and preserving salmon harvests for consumption. The adequate drying of salmon requires ample periods of dry weather to achieve suitable preservation. Local KMA residents have expressed that the current fishing schedules have consequently hastened these practices. While striving to address conservation concerns of Chinook salmon, the Kuskokwim River Salmon Management Plan (5 AAC 07.365) intentionally delays opening the river to subsistence fishing to allow escapement goals to be reached. The time period of this "front-end closure" often coincides with fair weather, which is critical to proper processing and preservation methods of salmon. In addition, residents have expressed that the current regulatory structure greatly reduces the ability to plan and coordinate fish camp activities, leads to increased fish camp theft, and reduces the generational transfer of knowledge of processing and preservation methods.

During times of low salmon runs, subsistence users often engage in resource substitution where they focus their energy on harvesting alternate, but more available resources. For example, households in the lower river region may opt to harvest more sockeye salmon to compensate for poor chum salmon harvests, while households in the middle or upper river regions may harvest moose to compensate for poor salmon harvests. While it is important to consider that resource substitution continues to provide a vital subsistence opportunity during periods of low abundance of other resources, it often fails to provide equal nutritional or cultural value to the harvester.

Sharing is an important component of the subsistence way of life throughout the KMA. Households may share resources among other households and with relatives or friends both inside and outside of the KMA. This sharing proves vital during times of low abundance of salmon or limited harvest opportunities and may ensure that a household's subsistence needs are being met.

In communities throughout the Kuskokwim River drainage, households that harvest salmon for themselves may also harvest salmon for households outside of their own. This can impact how a respondent answers the survey question "did you get enough?" Although a respondent may indicate that they met their own household's harvest goals for a specific species of salmon, it may also be true that the household did not meet harvest goals for the other households they fish for. Additionally, household harvest goals for specific species of salmon may have changed throughout the years for some households. For example, prior to highly regulated management initiatives, households often had more opportunity to harvest a set number of Chinook and sockeye salmon. After not reaching those goals over the course of several seasons, a household may reevaluate its goals and adjust accordingly. Thus, although a household may have indicated that they met their harvest goals for a specific species of salmon in 2022, their answer does not necessarily reflect changes over time in a household's harvest goals.

The ability of Kuskokwim area families to achieve their subsistence salmon harvest goals each season is shaped by a variety of factors. Fishery management actions, equipment issues, and personal circumstances all affect annual salmon harvests. In addition, natural occurrences such as low run abundance, river conditions, or weather events affect harvests. Moreover, many fishers have attributed poor returns and subsequent poor harvests of Chinook and chum salmon to bycatch among high seas commercial fishing operations. Challenges associated with subsistence salmon harvests are not exclusive to families within any one particular portion of the drainage. Rather, these factors are common issues to families throughout much of the Kuskokwim River drainage.

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APPENDIX A–SALMON HARVEST ESTIMATES, 1990–2022

Table A1.–Chinook salmon harvest estimates, surveyed communities, Kuskokwim Management Area,1990–2022.

	Year																
Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Kongiganak[a]	1,559	729	929	680	1,281	1,095	1,108	1,376	1,128	1,153	1,285	1,612	1,349	2,003	2,663	1,536	1,729
North Kuskokwim Bay	**1,559**	**729**	**929**	**680**	**1,281**	**1,095**	**1,108**	**1,376**	**1,128**	**1,153**	**1,285**	**1,612**	**1,349**	**2,003**	**2,663**	**1,536**	**1,729**
Tuntutuliak	4,174	4,156	3,750	3,905	5,019	3,928	4,256	3,159	3,797	3,412	2,826	2,958	3,907	2,657	3,912	4,545	4,469
Eek	4,923	2,617	2,057	2,496	2,976	3,679	2,786	2,009	2,215	1,730	2,140	2,035	2,514	2,075	2,954	3,133	***2,501***
Kasigluk	3,300	2,875	***3,150***	***3,609***	***3,351***	***3,208***	***3,294***	***3,480***	***2,617***	***5,473***	3,857	***5,054***	***4,685***	***4,711***	7,859	***5,242***	***4,905***
Nunapitchuk	4,192	4,004	4,123	3,852	4,580	4,543	3,479	3,605	4,502	4,215	3,425	3,328	4,503	3,179	4,921	4,103	4,121
Atmautluak	2,895	1,661	1,239	1,715	1,856	2,016	1,752	1,648	1,397	1,372	1,191	754	1,479	547	2,153	1,927	***1,758***
Napakiak	4,427	2,573	4,147	3,822	3,355	3,515	3,842	2,908	3,436	2,265	2,073	2,408	2,702	2,438	2,839	3,060	5,125
Napaskiak	6,586	4,008	5,299	5,566	6,521	4,862	5,261	4,756	4,901	3,633	4,175	4,596	3,922	3,390	4,058	4,485	5,877
Oscarville	1,263	1,476	***1,501***	1,496	1,390	1,046	995	***1,056***	754	1,543	***1,259***	1,779	1,115	1,153	1,325	1,069	1,052
Bethel	34,925	18,041	22,220	19,800	31,251	32,463	32,116	20,100	24,877	22,751	20,629	24,684	22,892	24,584	29,443	28,293	27,805
Kwethluk	10,657	7,298	6,949	9,280	9,546	9,907	9,786	6,319	7,502	6,366	5,174	6,460	6,880	4,206	7,157	6,089	7,258
Akiachak	8,395	5,607	8,130	7,678	7,622	6,410	5,689	6,699	6,026	5,210	6,311	6,978	6,946	2,493	7,131	5,411	5,561
Akiak	5,966	3,168	3,452	4,478	4,653	4,401	4,851	3,196	2,943	2,377	2,335	3,528	3,390	3,905	3,775	3,860	4,423
Tuluksak	2,022	3,114	2,330	3,662	4,414	4,175	3,309	5,456	3,554	2,239	2,464	2,520	2,860	3,286	3,766	2,655	2,372
Lower Kuskokwim River	**93,725**	**60,598**	**68,347**	**71,359**	**86,534**	**84,153**	**81,416**	**64,391**	**68,521**	**62,586**	**57,859**	**67,082**	**67,795**	**58,624**	**81,293**	**73,872**	**77,228**
Lower Kalskag	2,946	4,022	2,338	3,603	4,087	4,541	3,513	3,103	1,954	1,726	1,691	2,432	1,535	1,556	1,991	1,417	3,494
Upper Kalskag	1,618	1,031	1,321	1,682	1,297	1,447	1,304	941	1,394	1,670	1,234	1,149	1,545	1,328	2,498	2,533	1,569
Aniak	3,589	3,562	3,976	4,651	3,714	3,506	3,343	3,640	3,466	2,603	3,100	2,684	4,576	1,837	3,022	1,977	2,412
Chuathbaluk	1,718	998	986	1,443	1,013	2,461	914	1,204	730	1,035	281	700	505	405	1,460	913	887
Middle Kuskokwim River	**9,871**	**9,613**	**8,621**	**11,379**	**10,111**	**11,955**	**9,074**	**8,888**	**7,544**	**7,034**	**6,306**	**6,965**	**8,161**	**5,126**	**8,971**	**6,840**	**8,362**

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Table A1.–Page 2 of 4.

Community	Year																
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Crooked Creek	971	916	583	707	1,126	874	890	963	768	702	592	689	859	582	946	948	736
Red Devil	297	154	400	449	409	412	359	404	243	141	95	174	293	31	156	181	232
Sleetmute	777	887	782	1,795	1,295	964	1,265	1,171	978	414	412	505	604	600	906	522	750
Stony River	574	614	247	445	391	534	596	874	***293***	46	***178***	167	415	118	688	***311***	***288***
Lime Village	399	70	***162***	40	195	180	***141***	57	241	145	69	251	***178***	34	69	***171***	***103***
McGrath	896	902	1,586	550	1,026	804	1,223	995	872	1,033	656	444	970	395	587	***910***	689
Takotna	74	0	***6***	0	0	***11***	*7*	***3***	2	0	0	5	10	***0***	16	***8***	0
Nikolai	635	337	818	426	449	938	398	212	380	284	144	280	535	***224***	493	***564***	696
Upper Kuskokwim River	**4,623**	**3,880**	**4,584**	**4,412**	**4,891**	**4,717**	**4,879**	**4,679**	**3,777**	**2,765**	**2,146**	**2,515**	**3,864**	**1,984**	**3,861**	**3,615**	**3,494**
Kuskokwim River Total[b]	**108,219**	**74,091**	**81,552**	**87,150**	**101,536**	**100,826**	**95,369**	**77,958**	**79,841**	**72,385**	**66,311**	**76,562**	**79,820**	**65,734**	**94,125**	**84,327**	**89,083**
Quinhagak	3,881	3,753	4,394	3,634	3,977	2,864	3,506	3,186	3,774	2,815	3,053	3,177	2,649	2,563	4,563	3,505	5,163
Goodnews Bay	358	852	548	590	672	789	392	441	735	759	564	863	723	807	863	869	713
Platinum	202	20	67	75	74	24	***41***	14	***57***	69	99	57	154	45	122	74	45
South Kuskokwim Bay	**4,441**	**4,625**	**5,009**	**4,299**	**4,723**	**3,677**	**3,939**	**3,641**	**4,566**	**3,643**	**3,716**	**4,097**	**3,526**	**3,415**	**5,548**	**4,448**	**5,921**
Kuskokwim Area Total	**114,219**	**79,445**	**87,490**	**92,129**	**107,540**	**105,598**	**100,417**	**82,975**	**85,535**	**77,181**	**71,312**	**82,271**	**84,695**	**71,152**	**102,336**	**90,311**	**96,733**

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Table A1.–Page 3 of 4.

Community	Year																Average	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	5-yr	10-yr
Kongiganak[a]	***1,865***	2,233	1,243	1,456	1,208	***287***	***641***	***964***	–	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**1,865**	**2,233**	**1,243**	**1,456**	**1,208**	**287**	**641**	**964**	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	4,614	***4,266***	3,067	3,261	3,032	1,123	2,448	***574***	1,668	1,963	1,459	2,178	2,102	2,322	2,173	2,361	2,227	1,925
Eek	***2,512***	***2,966***	1,982	1,761	1,378	1,004	1,188	665	850	1,460	825	706	1,323	1,999	1,091	1,281	1,280	1,139
Kasigluk	***5,167***	2,471	2,464	3,014	2,823	552	2,919	205	438	951	791	843	1,628	1,908	917	1,532	1,366	1,213
Nunapitchuk	4,661	***4,234***	3,468	2,548	3,559	845	2,563	287	1,051	1,695	761	1,389	1,975	1,750	1,277	2,493	1,777	1,524
Atmautluak	1,890	***1,298***	1,567	1,088	1,236	234	1,592	108	514	763	195	661	1,135	692	643	728	772	703
Napakiak	3,245	1,903	2,387	1,674	1,963	457	1,588	311	917	1,151	505	842	948	869	755	806	844	869
Napaskiak	6,392	4,555	5,372	4,333	3,360	1,108	2,939	422	816	1,535	858	1,079	2,551	1,036	2,110	1,453	1,646	1,480
Oscarville	1,360	1,351	754	618	694	51	585	68	120	208	122	123	238	360	105	58	177	199
Bethel	30,422	27,800	26,170	26,157	25,093	7,321	17,246	3,089	4,918	9,462	5,336	5,469	12,694	13,578	8,511	12,639	10,578	9,294
Kwethluk	6,466	8,451	7,130	4,440	2,467	1,709	3,192	959	900	1,731	1,019	1,518	2,679	1,869	1,799	1,963	1,966	1,763
Akiachak	7,621	9,719	7,361	4,470	3,852	2,862	3,585	1,033	1,103	3,438	1,415	2,520	3,443	2,516	2,827	2,834	2,828	2,471
Akiak	4,297	4,090	3,247	3,625	2,455	***1,218***	1,449	530	610	1,274	694	1,249	1,454	1,245	2,264	1,321	1,507	1,209
Tuluksak	***3,266***	2,937	3,212	2,057	1,230	651	732	404	231	709	511	705	1,026	919	882	866	880	699
Lower Kuskokwim River	**81,914**	**76,040**	**68,181**	**59,046**	**53,142**	**19,135**	**42,026**	**8,655**	**14,136**	**26,340**	**14,491**	**19,282**	**33,196**	**31,063**	**25,354**	**30,334**	**27,846**	**24,488**
Lower Kalskag	1,937	1,748	2,525	1,030	1,260	459	744	283	351	578	260	474	1,000	685	513	923	719	581
Upper Kalskag	1,383	2,435	1,696	1,496	1,772	562	1,317	258	334	838	190	638	746	860	454	783	696	642
Aniak	3,417	3,100	2,130	2,262	2,214	993	1,440	344	542	1,293	718	803	1,315	1,544	1,325	1,128	1,223	1,045
Chuathbaluk	***973***	772	877	551	409	103	155	90	90	203	100	216	340	317	180	277	266	197
Middle Kuskokwim River	**7,710**	**8,055**	**7,228**	**5,339**	**5,655**	**2,117**	**3,656**	**975**	**1,317**	**2,912**	**1,268**	**2,131**	**3,401**	**3,406**	**2,472**	**3,111**	**2,904**	**2,465**

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Table A1.–Page 4 of 4.

Community	Year																Average	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	5-yr	10-yr
Crooked Creek	***647***	488	608	240	402	124	***145***	35	78	384	110	144	289	238	153	292	223	187
Red Devil	301	148	258	33	186	225	77	83	52	69	38	10	69	45	55	19	40	52
Sleetmute	861	933	693	272	242	132	96	58	137	169	36	76	133	176	140	80	121	110
Stony River	***530***	514	704	189	134	***151***	51	24	25	33	109	53	***90***	***95***	137	0	75	62
Lime Village[a]	***95***	***29***	***75***	***47***	***118***	29	***43***	***32***	_	35	33	10	37	***32***	***12***	***19***	22	28
McGrath	495	288	600	262	829	68	95	173	75	384	118	239	375	439	83	88	245	207
Takotna	***10***	***0***	***8***	***0***	0	***0***	***0***	***0***	3	0	0	2	***4***	7	0	***0***	3	2
Nikolai	***471***	184	298	402	450	276	283	235	301	367	177	317	346	367	237	210	295	284
Upper Kuskokwim River	**3,409**	**2,584**	**3,244**	**1,445**	**2,361**	**1,005**	**790**	**640**	**671**	**1,441**	**621**	**851**	**1,343**	**1,399**	**817**	**708**	**1,024**	**928**
Kuskokwim River Total[b]	**93,033**	**86,679**	**78,653**	**65,830**	**61,158**	**22,257**	**46,472**	**10,270**	**16,124**	**30,693**	**16,380**	**22,264**	**37,940**	**35,868**	**28,643**	**34,153**	**31,774**	**27,881**
Quinhagak	4,686	3,125	3,312	2,793	2,588	2,396	3,143	3,723	3,082	4,822	5,217	3,592	5,690	4,757	2,728	4,004	4,154	4,076
Goodnews Bay	***647***	898	569	480	834	389	413	431	220	654	457	555	864	766	388	963	707	571
Platinum	***66***	42	61	17	62	24	39	46	11	99	96	67	142	84	78	215	117	88
South Kuskokwim Bay	**5,399**	**4,065**	**3,942**	**3,290**	**3,484**	**2,809**	**3,595**	**4,200**	**3,313**	**5,575**	**5,770**	**4,214**	**6,696**	**5,607**	**3,194**	**5,182**	**4,979**	**4,735**
Kuskokwim Area Total	**100,297**	**92,977**	**83,838**	**70,576**	**65,850**	**25,353**	**50,708**	**15,434**	**19,437**	**36,268**	**22,150**	**26,478**	**44,636**	**41,475**	**31,837**	**39,335**	**36,752**	**32,776**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Bold, italic text indicates Bayesian estimates.

a. Dashes indicate that harvest was not estimated and could not be generated using Bayesian imputation due to lack of data.

b. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table A2.–Chum salmon harvest estimates, surveyed communities, Kuskokwim Management Area,1990–2022.

	Year																
Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Kongiganak[a]	1,009	978	1,584	708	1,414	1,269	1,763	753	1,579	1,049	1,839	2,399	3,247	897	2,958	1,960	2,420
North Kuskokwim Bay	**1,009**	**978**	**1,584**	**708**	**1,414**	**1,269**	**1,763**	**753**	**1,579**	**1,049**	**1,839**	**2,399**	**3,247**	**897**	**2,958**	**1,960**	**2,420**
Tuntutuliak	6,592	4,697	6,245	3,325	5,346	3,509	6,119	2,435	3,640	1,709	2,622	2,585	4,150	1,288	2,546	3,568	4,024
Eek	3,014	790	1,324	250	591	899	999	556	795	484	636	402	1,228	578	688	877	***1,075***
Kasigluk	3,877	3,013	***4,076***	***2,522***	***2,663***	***2,774***	***4,047***	***1,951***	***2,543***	***4,777***	4,689	***5,158***	***5,513***	***3,581***	5,064	***4,194***	***5,461***
Nunapitchuk	6,448	5,840	9,195	4,895	4,560	4,264	6,255	2,465	4,885	4,428	4,865	4,724	8,002	2,865	5,053	4,167	5,150
Atmautluak	4,676	2,241	2,614	1,300	1,420	3,768	2,660	1,395	1,875	1,552	1,848	1,397	2,514	849	2,271	1,940	*2,337*
Napakiak	9,714	2,351	5,474	2,269	3,819	2,820	4,352	1,430	3,605	1,495	2,859	1,793	3,421	1,560	2,328	3,238	8,143
Napaskiak	11,334	6,703	7,817	3,653	5,797	4,137	6,200	2,318	3,771	2,529	2,757	2,364	4,010	2,061	2,705	2,205	4,323
Oscarville	1,400	1,147	*1,598*	561	676	740	1,548	*348*	378	1,530	*1,237*	1,831	1,319	804	828	686	1,151
Bethel	34,257	16,781	17,231	8,608	15,722	17,416	21,706	8,078	12,522	9,918	10,149	10,757	17,731	11,452	13,448	14,273	20,953
Kwethluk	11,451	5,714	8,001	3,499	6,340	6,114	12,043	3,266	4,508	3,582	5,232	4,601	8,019	2,294	4,288	4,328	6,328
Akiachak	10,565	5,921	9,532	3,308	5,998	3,992	5,019	1,615	2,218	2,696	4,719	3,170	5,173	2,650	3,880	2,428	4,333
Akiak	9,226	6,575	6,679	7,577	4,483	2,007	4,967	1,639	1,894	1,210	2,617	2,240	2,571	2,928	3,499	3,528	3,095
Tuluksak	5,863	5,454	4,632	3,774	2,395	2,698	3,208	2,790	3,044	1,480	2,492	2,068	3,719	894	2,433	2,183	3,094
Lower Kuskokwim River	**118,417**	**67,227**	**84,418**	**45,541**	**59,810**	**55,138**	**79,123**	**30,286**	**45,678**	**37,390**	**46,722**	**43,090**	**67,370**	**33,804**	**49,031**	**47,615**	**69,466**
Lower Kalskag	4,980	2,958	2,807	2,938	2,856	1,438	4,070	1,298	968	733	1,534	1,498	1,445	1,087	1,316	997	4,703
Upper Kalskag	1,406	3,139	3,040	591	836	1,326	1,565	349	464	649	1,550	1,502	2,460	516	1,656	1,201	2,469
Aniak	10,160	3,511	7,687	2,926	2,538	3,454	8,569	1,678	4,964	1,753	1,933	1,934	4,367	820	2,535	2,952	3,722
Chuathbaluk	4,408	2,138	2,644	2,879	1,495	1,701	2,175	1,135	925	698	654	2,711	1,458	2,502	2,352	530	1,451
Middle Kuskokwim River	**20,954**	**11,746**	**16,178**	**9,334**	**7,725**	**7,919**	**16,379**	**4,460**	**7,321**	**3,833**	**5,671**	**7,645**	**9,730**	**4,925**	**7,859**	**5,680**	**12,345**

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Table A2.–Page 2 of 4.

Community	Year																
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Crooked Creek	2,977	1,326	1,242	664	757	332	355	313	2,527	830	809	1,211	1,417	750	1,583	1,064	1,513
Red Devil	1,613	1,133	1,500	927	1,318	882	727	499	462	169	54	334	384	63	135	214	41
Sleetmute	2,006	1,880	2,961	692	1,520	1,683	1,250	417	870	340	371	379	1,293	468	1,054	422	1,475
Stony River	1,234	638	1,165	775	881	1,311	443	600	*395*	296	***320***	172	696	361	754	***324***	***790***
Lime Village	2,350	830	***1,299***	497	1,600	789	***306***	244	964	1,015	451	651	***869***	110	199	***573***	***316***
McGrath	2,326	1,083	4,472	578	1,264	1,525	211	138	1,510	242	188	247	969	513	290	***470***	999
Takotna	64	0	***15***	0	6	***1***	***0***	***0***	15	0	0	10	1	***0***	0	***4***	0
Nikolai	875	396	914	334	293	297	229	60	519	87	56	53	187	***191***	277	***230***	308
Upper Kuskokwim River	**13,445**	**7,286**	**13,568**	**4,467**	**7,639**	**6,820**	**3,521**	**2,271**	**7,262**	**2,979**	**2,249**	**3,057**	**5,816**	**2,456**	**4,292**	**3,301**	**5,442**
Kuskokwim River Total[b]	**152,816**	**86,259**	**114,164**	**59,342**	**75,174**	**69,877**	**99,023**	**37,017**	**60,261**	**44,202**	**54,641**	**53,792**	**82,916**	**41,185**	**61,182**	**56,595**	**87,254**
Quinhagak	3,161	1,631	2,287	1,053	1,401	669	943	572	1,375	1,587	895	808	2,011	559	1,383	994	2,754
Goodnews Bay	200	136	1,311	177	406	140	221	135	295	232	251	187	349	200	240	192	555
Platinum	149	4	137	0	51	3	*26*	0	*51*	33	82	60	95	19	42	21	108
South Kuskokwim Bay	**3,510**	**1,771**	**3,735**	**1,230**	**1,858**	**812**	**1,190**	**707**	**1,721**	**1,852**	**1,228**	**1,055**	**2,455**	**778**	**1,665**	**1,207**	**3,417**
Kuskokwim Area Total	**157,335**	**89,008**	**119,483**	**61,280**	**78,446**	**71,958**	**101,975**	**38,477**	**63,561**	**47,103**	**57,708**	**57,246**	**88,618**	**42,860**	**65,805**	**59,762**	**93,091**

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Table A2.–Page 3 of 4.

Community	Year																Average	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	5-yr	10-yr
Kongiganak[a]	***2,353***	1,755	1,420	2,522	2,809	***1,638***	***1,397***	***1,915***	–	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**2,353**	**1,755**	**1,420**	**2,522**	**2,809**	**1,638**	**1,397**	**1,915**	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	3,350	***3,375***	3,330	2,439	1,865	2,614	2,180	***2,967***	2,143	1,673	2,158	2,739	2,290	1,261	739	1,015	1,609	1,916
Eek	***783***	***788***	782	721	486	1,552	1,232	1,182	1,023	681	762	809	315	475	316	795	542	759
Kasigluk	***4,309***	1,502	1,857	2,338	2,029	3,261	2,197	3,612	2,080	1,485	2,360	2,312	2,007	2,697	744	653	1,683	2,015
Nunapitchuk	6,619	***4,705***	3,468	3,223	4,257	5,312	2,977	5,213	3,631	2,422	5,035	4,058	2,721	2,384	496	669	2,066	2,961
Atmautluak	2,193	***2,177***	1,665	1,386	1,864	2,701	2,409	3,327	2,165	1,609	2,090	2,509	1,502	957	219	643	1,166	1,743
Napakiak	3,628	1,313	1,638	1,759	1,546	1,711	1,185	2,392	1,508	2,091	1,726	1,959	1,386	879	208	325	951	1,366
Napaskiak	3,032	2,400	1,451	3,110	1,783	3,216	2,589	3,171	2,173	1,901	2,355	2,402	2,045	1,246	766	594	1,411	1,924
Oscarville	932	847	534	352	402	599	490	599	350	240	261	553	386	502	27	110	316	352
Bethel	16,540	15,853	10,055	9,575	15,324	26,872	12,506	18,017	10,958	13,494	17,780	9,385	10,493	7,983	3,153	3,048	6,812	10,682
Kwethluk	6,291	5,729	4,111	3,112	3,484	3,849	3,825	4,318	2,230	2,326	4,501	2,994	1,805	1,703	706	544	1,550	2,495
Akiachak	4,782	6,856	2,872	2,856	3,205	4,150	3,417	4,744	2,085	2,176	3,311	3,897	1,652	1,318	707	554	1,626	2,386
Akiak	4,141	3,522	1,350	1,163	2,421	*2,925*	2,212	2,982	2,348	5,803	3,026	3,299	2,033	1,452	743	493	1,604	2,439
Tuluksak	***3,202***	2,920	1,570	3,180	2,697	***2,585***	3,062	2,274	1,747	2,698	2,408	2,623	1,738	987	349	663	1,272	1,855
Lower Kuskokwim River	**59,803**	**51,988**	**34,683**	**35,214**	**41,363**	**61,347**	**40,281**	**54,798**	**34,441**	**38,599**	**47,773**	**39,539**	**30,373**	**23,844**	**9,173**	**10,105**	**22,607**	**32,893**
Lower Kalskag	1,997	1,004	930	691	1,643	3,284	1,214	1,458	1,233	624	1,019	1,081	369	624	86	250	482	796
Upper Kalskag	294	2,432	329	391	1,599	1,930	1,534	1,038	642	1,055	204	883	147	295	89	193	321	608
Aniak	4,108	2,830	2,602	2,515	2,391	5,667	2,880	4,695	1,395	2,422	1,604	1,822	2,038	658	235	76	966	1,782
Chuathbaluk	*1,541*	593	937	535	686	796	935	805	342	347	606	872	190	291	51	67	294	451
Middle Kuskokwim River	**7,940**	**6,859**	**4,798**	**4,132**	**6,319**	**11,677**	**6,563**	**7,996**	**3,612**	**4,448**	**3,433**	**4,658**	**2,744**	**1,868**	**461**	**585**	**2,063**	**3,637**

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Table A2.–Page 4 of 4.

Community	Year																Average	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	5-yr	10-yr
Crooked Creek	**813**	352	519	539	862	610	***1,803***	391	383	831	374	295	553	179	28	33	218	487
Red Devil	186	188	244	122	434	516	981	284	48	129	121	72	23	25	5	0	25	169
Sleetmute	818	373	367	524	689	1,004	542	633	337	268	147	142	115	25	23	0	61	223
Stony River	***540***	1,247	771	338	516	***491***	27	89	44	14	109	0	***128***	***44***	42	0	43	50
Lime Village[a]	***419***	***297***	***405***	***314***	***499***	419	***909***	***295***	_	232	135	175	90	***112***	***21***	***4***	80	219
McGrath	464	676	825	944	476	885	598	642	7	150	145	706	518	864	0	97	437	373
Takotna	***0***	***0***	***0***	***0***	0	***0***	***12***	***0***	0	5	0	0	***0***	0	0	***0***	0	2
Nikolai	*223*	54	292	440	349	1,044	513	1,356	2,000	205	352	331	24	31	6	0	78	482
Upper Kuskokwim River	**3,464**	**3,187**	**3,423**	**3,221**	**3,825**	**4,970**	**5,386**	**3,690**	**2,819**	**1,834**	**1,383**	**1,721**	**1,451**	**1,280**	**125**	**134**	**942**	**1,982**
Kuskokwim River Total[b]	**71,207**	**62,034**	**42,904**	**42,567**	**51,507**	**77,994**	**52,230**	**66,484**	**40,872**	**44,881**	**52,589**	**45,918**	**34,568**	**26,992**	**9,759**	**10,825**	**25,612**	**38,512**
Quinhagak	2,249	1,794	1,557	1,347	1,255	2,001	1,958	1,959	691	848	1,592	1,575	721	829	842	1,832	1,160	1,285
Goodnews Bay	*395*	586	138	324	349	322	153	268	197	219	90	147	114	146	26	26	92	139
Platinum	*77*	106	28	37	70	76	90	62	16	78	188	203	246	69	63	162	149	118
South Kuskokwim Bay	**2,720**	**2,486**	**1,723**	**1,708**	**1,674**	**2,399**	**2,201**	**2,289**	**904**	**1,145**	**1,870**	**1,925**	**1,081**	**1,044**	**931**	**2,019**	**1,400**	**1,541**
Kuskokwim Area Total	**76,281**	**66,275**	**46,047**	**46,797**	**55,990**	**82,030**	**55,828**	**70,687**	**41,776**	**46,026**	**54,459**	**47,843**	**35,649**	**28,036**	**10,690**	**12,844**	**27,012**	**40,384**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Bold, italic text indicates Bayesian estimates.

a. Dashes indicate that harvest was not estimated and could not be generated using Bayesian imputation due to lack of data.

b. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table A3.–Sockeye salmon harvest estimates, surveyed communities, Kuskokwim Management Area,1990–2022.

	Year																
Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Kongiganak[a]	552	498	923	583	743	658	951	976	878	908	1,770	1,546	1,347	929	1,809	1,103	1,464
North Kuskokwim Bay	**552**	**498**	**923**	**583**	**743**	**658**	**951**	**976**	**878**	**908**	**1,770**	**1,546**	**1,347**	**929**	**1,809**	**1,103**	**1,464**
Tuntutuliak	2,132	1,768	1,846	1,063	3,289	1,082	1,561	1,724	1,227	2,070	1,180	1,702	1,045	1,148	1,620	2,145	1,834
Eek	1,293	479	669	363	452	308	526	503	375	595	883	1,085	759	586	567	1,033	***684***
Kasigluk	843	1,376	***1,690***	***1,608***	***976***	***1,179***	***1,127***	***1,315***	***1,012***	***3,287***	3,805	***3,213***	***2,111***	***2,429***	1,668	***1,634***	***2,248***
Nunapitchuk	1,520	2,193	2,329	2,743	1,633	870	1,877	2,082	2,029	3,258	2,194	2,529	1,500	1,714	1,659	1,821	1,871
Atmautluak	1,696	830	1,193	1,313	837	1,173	1,408	681	982	1,743	1,540	988	1,150	679	1,103	1,444	***1,012***
Napakiak	1,548	1,187	1,663	1,217	1,533	887	1,106	1,526	1,487	2,018	1,916	1,917	1,688	1,453	1,351	2,122	1,845
Napaskiak	1,660	2,850	3,116	3,508	1,933	1,573	3,180	2,209	1,457	1,929	2,525	3,377	1,296	1,643	1,148	1,344	1,784
Oscarville	287	726	***938***	957	398	301	208	***442***	249	1,724	***1,115***	1,451	400	806	436	278	778
Bethel	11,787	11,428	9,225	9,501	11,370	8,802	10,556	10,233	8,464	12,094	11,613	14,264	8,850	12,198	11,679	14,297	12,816
Kwethluk	4,271	3,746	1,958	3,802	3,864	2,536	3,963	3,288	3,785	3,485	3,859	4,191	2,100	1,903	3,302	2,457	2,770
Akiachak	3,461	4,029	3,970	4,990	3,241	1,942	2,767	2,737	2,395	3,066	3,687	4,680	2,507	1,607	3,109	2,372	2,661
Akiak	1,873	1,696	1,769	3,537	1,740	809	1,544	1,327	1,640	1,151	1,036	2,005	1,214	995	1,258	1,920	2,000
Tuluksak	1,225	3,427	2,063	2,452	1,390	1,270	1,108	1,514	1,413	1,412	2,201	1,862	1,205	875	1,670	987	2,247
Lower Kuskokwim River	**33,596**	**35,735**	**32,428**	**37,054**	**32,656**	**22,732**	**30,931**	**29,581**	**26,515**	**37,832**	**37,554**	**43,264**	**25,825**	**28,036**	**30,570**	**33,854**	**34,550**
Lower Kalskag	1,007	1,080	503	2,286	989	679	1,387	1,277	546	583	824	918	347	515	775	439	1,434
Upper Kalskag	284	314	354	346	288	82	284	216	238	586	588	319	508	431	686	945	563
Aniak	1,539	2,073	1,213	1,609	751	955	1,295	1,078	1,132	1,302	1,136	2,167	1,059	756	996	1,015	692
Chuathbaluk	1,157	1,471	497	822	924	465	687	796	223	441	476	614	313	274	526	369	508
Middle Kuskokwim River	**3,987**	**4,938**	**2,567**	**5,063**	**2,952**	**2,181**	**3,653**	**3,367**	**2,139**	**2,912**	**3,024**	**4,018**	**2,227**	**1,976**	**2,983**	**2,768**	**3,197**

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Table A3.–Page 2 of 4.

Community	Year																
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Crooked Creek	1,607	968	738	752	558	177	311	350	717	710	514	640	449	571	732	693	544
Red Devil	455	391	355	662	336	576	914	637	692	497	109	360	109	309	88	272	510
Sleetmute	1,153	1,347	794	1,643	1,120	1,109	1,341	1,458	1,282	879	725	1,008	706	504	980	673	1,181
Stony River	933	1,966	1,389	1,485	758	1,281	1,267	1,626	***1,023***	1,018	***654***	163	602	158	896	***688***	***746***
Lime Village	2,125	1,110	***1,304***	2,743	1,733	857	***1,225***	642	2,782	2,619	1,409	1,453	***1,186***	374	874	***1,368***	***1,216***
McGrath	1,489	416	2,494	1,465	1,501	1,652	111	52	146	0	43	273	407	112	194	***454***	149
Takotna	0	0	***1***	0	0	***2***	***1***	***1***	0	0	0	0	0	***1***	0	***1***	0
Nikolai	0	1	0	5	25	65	23	0	16	43	0	0	22	***2***	1	***10***	20
Upper Kuskokwim River	**7,762**	**6,199**	**7,075**	**8,755**	**6,031**	**5,719**	**5,193**	**4,766**	**6,658**	**5,766**	**3,454**	**3,897**	**3,481**	**2,031**	**3,765**	**4,160**	**4,365**
Kuskokwim River Total[b]	**45,345**	**46,872**	**42,070**	**50,872**	**41,639**	**30,632**	**39,777**	**37,714**	**35,312**	**46,510**	**44,032**	**51,179**	**31,533**	**32,044**	**37,318**	**40,782**	**42,113**
Quinhagak	1,710	1,818	1,448	1,228	962	597	499	460	1,368	1,433	1,368	1,054	909	805	1,375	1,745	3,128
Goodnews Bay	982	1,061	1,293	733	646	202	387	480	499	715	951	908	855	705	873	1,213	995
Platinum	163	134	238	48	90	32	***56***	143	***80***	106	188	83	257	64	183	90	63
South Kuskokwim Bay	**2,855**	**3,013**	**2,979**	**2,009**	**1,698**	**831**	**942**	**1,083**	**1,947**	**2,254**	**2,507**	**2,045**	**2,021**	**1,574**	**2,431**	**3,048**	**4,186**
Kuskokwim Area Total	**48,752**	**50,383**	**45,972**	**53,464**	**44,080**	**32,121**	**41,669**	**39,773**	**38,137**	**49,672**	**48,309**	**54,770**	**34,901**	**34,547**	**41,558**	**44,933**	**47,763**

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Table A3.–Page 3 of 4.

Community	Year																Average	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	5-yr	10-yr
Kongiganak[a]	***960***	1,502	1,018	1,869	1,266	***1,307***	***1,031***	***1,230***	–	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**960**	**1,502**	**1,018**	**1,869**	**1,266**	**1,307**	**1,031**	**1,230**	–	–	–	–	–	–	–	–	–	–
Tuntutuliak	1,763	***2,120***	932	2,068	1,274	1,516	1,183	***1,774***	1,999	1,707	1,438	1,978	1,969	1,839	2,571	2,618	2,195	1,908
Eek	***558***	***834***	1,019	1,241	664	1,490	1,319	1,450	1,111	888	1,266	1,138	1,048	1,422	1,505	2,549	1,532	1,370
Kasigluk	***1,786***	1,041	1,215	1,441	1,269	1,451	1,470	1,990	1,442	1,543	1,703	1,448	2,416	2,701	2,020	2,723	2,262	1,946
Nunapitchuk	2,147	***2,549***	1,538	1,902	2,223	2,396	1,806	2,059	2,851	2,508	1,570	1,532	3,273	2,609	3,166	3,444	2,805	2,482
Atmautluak	1,041	***1,250***	624	731	827	1,623	1,316	1,531	1,173	1,562	1,535	1,621	2,093	1,055	2,394	2,482	1,929	1,676
Napakiak	1,962	1,244	917	1,183	1,351	1,141	1,105	1,573	1,179	2,132	916	1,336	1,688	1,503	1,241	2,013	1,556	1,469
Napaskiak	1,738	2,620	1,579	1,979	1,587	2,065	2,069	2,514	2,022	2,086	1,404	1,980	3,029	1,708	3,968	3,055	2,748	2,384
Oscarville	712	677	332	250	228	323	347	679	282	329	260	234	541	497	212	384	374	377
Bethel	13,902	15,247	11,272	11,103	16,946	18,282	12,616	14,828	11,951	16,730	17,477	8,127	17,608	16,912	13,454	17,249	14,670	14,695
Kwethluk	3,536	4,920	2,432	2,534	2,357	2,884	2,705	5,921	1,955	2,464	3,257	2,233	2,381	2,518	2,309	2,703	2,429	2,845
Akiachak	3,269	4,354	2,407	2,433	2,647	3,443	2,594	3,047	2,551	2,726	3,316	2,848	2,770	2,126	3,836	2,362	2,788	2,818
Akiak	3,695	2,881	1,290	1,161	2,576	***1,818***	1,731	2,418	1,855	3,772	3,398	2,757	2,248	1,595	1,922	1,589	2,022	2,329
Tuluksak	***1,845***	2,133	1,691	2,483	1,699	1,380	1,541	622	1,037	1,249	1,256	1,231	1,074	870	1,110	1,387	1,134	1,138
Lower Kuskokwim River	**37,955**	**41,869**	**27,248**	**30,509**	**35,648**	**39,812**	**31,802**	**40,406**	**31,408**	**39,696**	**38,796**	**28,463**	**42,138**	**37,355**	**39,708**	**44,561**	**38,445**	**37,433**
Lower Kalskag	780	1,583	1,044	507	802	891	977	1,040	487	284	630	695	348	427	521	316	461	572
Upper Kalskag	417	1,000	369	460	938	770	662	839	718	1,176	509	516	426	661	217	562	476	629
Aniak	1,261	1,585	923	1,165	1,168	1,375	1,466	1,578	2,407	8,380	5,277	3,500	3,235	1,723	1,463	1,117	2,208	3,015
Chuathbaluk	***484***	363	564	403	300	297	480	481	382	210	631	466	328	280	274	175	305	371
Middle Kuskokwim River	**2,942**	**4,531**	**2,900**	**2,535**	**3,208**	**3,333**	**3,585**	**3,938**	**3,994**	**10,050**	**7,047**	**5,177**	**4,337**	**3,091**	**2,475**	**2,170**	**3,450**	**4,586**

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Table A3.–Page 4 of 4.

Community	Year																Average	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	5-yr	10-yr
Crooked Creek	***523***	220	329	302	243	234	***514***	391	303	264	508	297	687	678	328	310	460	428
Red Devil	318	359	477	475	502	511	270	151	88	238	206	137	67	118	98	25	89	140
Sleetmute	1,303	1,164	684	1,024	693	715	362	541	497	458	514	511	638	816	687	343	599	537
Stony River	***1,019***	1,476	977	372	303	***469***	447	137	91	95	138	92	***357***	***627***	726	0	360	271
Lime Village[a]	***1,406***	***659***	***1,080***	***932***	***739***	780	***831***	***888***	_	541	325	224	420	***545***	***255***	***96***	308	458
McGrath	375	417	965	650	630	233	538	451	0	199	892	507	71	291	229	24	224	320
Takotna	***1***	***3***	***3***	***2***	0	***2***	***2***	***3***	0	5	1	0	***0***	0	0	***0***	0	1
Nikolai	***14***	13	66	65	13	0	0	236	400	34	35	40	30	10	28	0	22	81
Upper Kuskokwim River	**4,960**	**4,310**	**4,581**	**3,822**	**3,123**	**2,945**	**2,964**	**2,798**	**1,379**	**1,834**	**2,619**	**1,808**	**2,270**	**3,085**	**2,351**	**798**	**2,062**	**2,191**
Kuskokwim River Total[b]	**45,856**	**50,711**	**34,729**	**36,866**	**41,979**	**46,089**	**38,351**	**47,142**	**36,781**	**51,580**	**48,462**	**35,448**	**48,745**	**43,531**	**44,534**	**47,528**	**43,957**	**44,210**
Quinhagak	1,755	2,097	1,960	1,719	1,582	2,015	2,158	2939	1065	1,691	3,850	2,622	2,537	2,000	3,170	4,802	3,026	2,683
Goodnews Bay	***920***	1,739	902	1,093	1,328	1,197	1,113	1370	797	975	677	777	1,201	941	1,684	2,460	1,413	1,199
Platinum	***121***	156	186	175	135	173	181	349	148	381	533	210	409	358	660	452	418	368
South Kuskokwim Bay	**2,796**	**3,992**	**3,048**	**2,987**	**3,045**	**3,385**	**3,452**	**4,658**	**2,010**	**3,047**	**5,060**	**3,609**	**4,147**	**3,299**	**5,514**	**7,714**	**4,857**	**4,251**
Kuskokwim Area Total	**49,613**	**56,205**	**38,795**	**41,722**	**46,290**	**50,781**	**42,834**	**53,030**	**38,791**	**54,627**	**53,522**	**39,057**	**52,892**	**46,830**	**50,048**	**55,242**	**48,814**	**48,687**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Bold, italic text indicates Bayesian estimates.

a. Dashes indicate that harvest was not estimated and could not be generated using Bayesian imputation due to lack of data.

b. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table A4.–Coho salmon harvest estimates, surveyed communities, Kuskokwim Management Area,1990–2022.

	Year																
Community	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Kongiganak[a]	474	490	605	448	569	662	579	514	204	203	339	919	1,138	236	937	740	657
North Kuskokwim Bay	**474**	**490**	**605**	**448**	**569**	**662**	**579**	**514**	**204**	**203**	**339**	**919**	**1,138**	**236**	**937**	**740**	**657**
Tuntutuliak	1,287	733	693	820	364	339	1,335	558	858	277	3,264	335	1,239	2,092	1,189	1,074	948
Eek	1,800	387	502	160	399	387	437	63	314	242	493	241	821	747	1,018	378	***773***
Kasigluk	922	1,723	***1,388***	***372***	***532***	***90***	***519***	***170***	***330***	***3,906***	9,726	***1,058***	***2,195***	***1,762***	5,034	***1,304***	***3,070***
Nunapitchuk	746	1,131	2,242	318	749	629	1,444	732	345	368	355	425	821	627	555	807	692
Atmautluak	398	237	333	380	402	634	534	485	283	190	227	375	612	283	744	530	***254***
Napakiak	1,470	599	1,570	586	871	344	602	161	739	459	453	667	793	992	1,648	742	2,363
Napaskiak	1,139	798	1,108	780	2,016	584	506	592	488	316	836	455	717	983	655	602	1,640
Oscarville	57	147	***151***	0	48	0	15	***0***	0	779	***216***	90	161	19	304	60	175
Bethel	32,988	17,677	24,908	12,310	17,082	22,007	21,982	17,077	12,058	11,565	13,478	14,108	15,489	15,062	17,040	12,994	18,810
Kwethluk	3,928	2,311	2,419	1,809	1,880	1,690	2,995	1,104	1,583	2,883	3,435	1,773	2,706	1,787	3,430	3,048	1,245
Akiachak	1,910	2,337	3,058	1,102	1,281	628	903	383	409	662	2,555	1,912	1,690	1,627	2,397	1,817	1,714
Akiak	1,789	2,193	1,072	1,373	1,099	481	920	798	521	259	479	594	1,136	1,094	1,342	1,847	379
Tuluksak	978	1,854	1,629	408	223	522	1,175	418	812	298	520	1,136	1,349	921	1,007	484	498
Lower Kuskokwim River	**49,412**	**32,127**	**41,074**	**20,418**	**26,946**	**28,335**	**33,367**	**22,541**	**18,740**	**22,204**	**36,037**	**23,169**	**29,729**	**27,996**	**36,363**	**25,687**	**32,561**
Lower Kalskag	445	500	526	823	881	715	1,246	572	345	285	403	597	281	314	368	319	1,415
Upper Kalskag	346	527	972	353	178	257	348	661	834	155	286	536	1,069	462	1,500	594	1,799
Aniak	1,669	1,171	1,933	1,104	1,768	1,244	2,723	1,428	1,284	1,419	1,911	2,006	3,737	1,164	2,355	2,032	1,018
Chuathbaluk	826	87	368	366	741	79	409	196	50	138	462	733	610	259	284	346	727
Middle Kuskokwim River	**3,286**	**2,285**	**3,799**	**2,646**	**3,568**	**2,295**	**4,726**	**2,857**	**2,513**	**1,997**	**3,062**	**3,872**	**5,697**	**2,199**	**4,507**	**3,291**	**4,959**

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Table A4.–Page 2 of 4.

Community	Year																
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Crooked Creek	922	279	712	396	646	358	175	261	394	529	137	97	440	375	713	312	401
Red Devil	914	1,038	1,284	1,673	1,074	1,539	1,135	1,455	504	424	161	426	499	351	65	331	171
Sleetmute	1,036	1,588	937	912	626	1,104	870	419	267	210	525	428	806	731	505	581	671
Stony River	474	513	727	511	477	1,023	529	455	***378***	423	***348***	397	662	214	679	***468***	***322***
Lime Village	486	390	***345***	606	1,467	223	***607***	270	776	701	556	559	***680***	46	231	***372***	***132***
McGrath	466	477	2,146	563	998	604	824	745	734	338	881	436	1,508	997	1,228	***799***	894
Takotna	0	0	***4***	0	0	***6***	***6***	***2***	3	0	20	31	25	***6***	51	***8***	0
Nikolai	90	65	204	285	94	499	36	130	97	73	30	131	93	***379***	171	***166***	407
Upper Kuskokwim River	**4,388**	**4,350**	**6,358**	**4,946**	**5,382**	**5,356**	**4,182**	**3,737**	**3,153**	**2,698**	**2,658**	**2,505**	**4,713**	**3,099**	**3,643**	**3,037**	**2,998**
Kuskokwim River Total[b]	**57,086**	**38,762**	**51,231**	**28,010**	**35,896**	**35,986**	**42,275**	**29,135**	**24,407**	**26,899**	**41,757**	**29,546**	**40,139**	**33,295**	**44,513**	**32,015**	**40,518**
Quinhagak	3,799	3,230	3,291	2,029	2,544	2,480	1,734	1,105	1,537	1,781	1,042	1,719	1,133	1,868	1,435	1,558	1,315
Goodnews Bay	1,630	1,704	1,671	1,118	428	268	330	348	323	421	380	548	198	1,228	1,542	634	605
Platinum	95	36	290	27	87	11	***46***	55	***75***	147	100	118	96	144	266	223	116
South Kuskokwim Bay	**5,524**	**4,970**	**5,252**	**3,174**	**3,059**	**2,759**	**2,110**	**1,508**	**1,935**	**2,349**	**1,522**	**2,385**	**1,427**	**3,240**	**3,243**	**2,415**	**2,036**
Kuskokwim Area Total	**63,084**	**44,222**	**57,088**	**31,632**	**39,524**	**39,407**	**44,964**	**31,157**	**26,546**	**29,451**	**43,618**	**32,850**	**42,704**	**36,771**	**48,693**	**35,170**	**43,211**

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Table A4.–Page 3 of 4.

Community	Year																Average	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	5-yr	10-yr
Kongiganak[a]	***883***	557	561	483	613	***356***	***412***	***561***	–	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**883**	**557**	**561**	**483**	**613**	**356**	**412**	**561**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	703	***1,620***	359	698	250	565	450	***794***	362	456	472	329	163	423	378	465	352	429
Eek	***459***	***661***	176	315	280	612	483	555	629	410	797	298	367	553	652	906	555	565
Kasigluk	***1,753***	867	629	1,043	430	303	418	851	446	394	390	422	436	687	285	513	469	484
Nunapitchuk	1,752	***508***	286	195	407	319	226	1,305	1,154	492	1,103	412	783	614	394	580	557	706
Atmautluak	424	***262***	67	36	263	383	203	176	311	81	415	81	482	425	300	733	404	321
Napakiak	1,244	1,006	420	877	927	402	634	740	1,117	506	379	597	1,073	929	371	617	717	696
Napaskiak	639	903	786	1,029	471	269	772	1,153	1,353	726	1,011	614	566	865	1,776	616	887	945
Oscarville	180	62	67	12	43	38	37	128	25	134	82	58	59	63	81	37	60	70
Bethel	12,972	15,839	12,895	20,426	18,141	13,280	12,662	19,364	12,277	16,801	17,852	8,978	15,596	16,861	11,161	6,814	11,882	13,837
Kwethluk	1,624	7,262	4,333	1,495	1,097	1,013	1,555	4,422	1,677	682	2,361	1,475	1,526	1,968	1,141	824	1,387	1,763
Akiachak	2,355	4,311	1,790	1,181	1,440	714	1,106	1,845	1,924	2,007	1,771	1,343	1,510	1,230	1,613	723	1,284	1,507
Akiak	1,325	1,358	661	475	505	***455***	454	1,501	1,423	2,403	3,566	683	1,768	843	1,218	475	997	1,433
Tuluksak	***1,131***	635	857	330	163	341	473	808	623	482	668	529	453	673	490	423	514	562
Lower Kuskokwim River	**26,561**	**35,293**	**23,326**	**28,112**	**24,417**	**18,694**	**19,473**	**33,642**	**23,321**	**25,574**	**30,867**	**15,819**	**24,782**	**26,134**	**19,860**	**13,726**	**20,064**	**23,320**
Lower Kalskag	515	76	318	96	684	1,107	529	907	419	228	347	430	339	319	80	163	266	376
Upper Kalskag	381	2,350	181	92	998	360	636	938	384	722	188	419	231	390	164	148	270	422
Aniak	3,003	2,883	2,223	2,533	2,215	3,365	3,102	9,566	7,705	7,530	4,883	2,107	2,698	3,139	950	612	1,901	4,229
Chuathbaluk	***419***	525	96	76	109	179	319	291	166	149	149	138	119	126	95	7	97	156
Middle Kuskokwim River	**4,318**	**5,834**	**2,818**	**2,797**	**4,006**	**5,011**	**4,586**	**11,702**	**8,674**	**8,629**	**5,567**	**3,094**	**3,387**	**3,974**	**1,289**	**931**	**2,535**	**5,183**

-continued-

Table A4.–Page 4 of 4.

Community	Year																Average	
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	5-yr	10-yr
Crooked Creek	***289***	952	283	87	297	149	***255***	198	275	298	256	138	238	243	170	68	171	214
Red Devil	193	307	126	88	130	238	318	792	214	166	106	50	117	30	35	0	46	183
Sleetmute	360	228	403	458	426	784	219	993	752	524	61	400	205	307	288	85	257	383
Stony River	***336***	552	634	201	333	***358***	120	177	77	29	86	23	***135***	***208***	135	10	102	100
Lime Village[a]	***443***	***695***	***210***	***146***	***596***	117	***384***	***226***	_	123	81	0	34	***55***	***15***	***2***	21	102
McGrath	279	247	1,175	1,053	1,331	2,257	523	1,189	173	769	663	411	2,260	1,342	901	411	1,065	864
Takotna	***8***	***6***	***28***	***20***	3	***22***	***0***	***0***	53	90	0	0	***2***	0	0	***8***	2	15
Nikolai	***95***	53	203	135	20	214	119	256	400	614	99	46	7	31	115	0	40	169
Upper Kuskokwim River	**2,005**	**3,040**	**3,062**	**2,188**	**3,136**	**4,139**	**1,938**	**3,831**	**1,944**	**2,613**	**1,352**	**1,068**	**2,998**	**2,216**	**1,659**	**584**	**1,705**	**2,020**
Kuskokwim River Total[b]	**32,883**	**44,167**	**29,206**	**33,097**	**31,559**	**27,844**	**25,997**	**49,175**	**33,939**	**36,816**	**37,786**	**19,981**	**31,167**	**32,324**	**22,808**	**15,241**	**24,304**	**30,523**
Quinhagak	1,550	1,869	1,824	1,599	1,369	1,380	1,087	2,240	2,238	2,014	1,734	1,486	1,791	1,395	1,105	1,508	1,457	1,660
Goodnews Bay	***468***	769	261	319	259	382	295	371	552	378	289	201	328	155	222	162	214	295
Platinum	***106***	114	81	197	143	124	50	240	87	180	273	254	142	380	189	113	216	191
South Kuskokwim Bay	**2,124**	**2,752**	**2,166**	**2,115**	**1,771**	**1,886**	**1,432**	**2,851**	**2,877**	**2,572**	**2,296**	**1,941**	**2,261**	**1,930**	**1,516**	**1,783**	**1,886**	**2,146**
Kuskokwim Area Total	**35,890**	**47,476**	**31,933**	**35,695**	**33,943**	**30,086**	**27,841**	**52,587**	**36,816**	**39,388**	**40,082**	**21,922**	**33,428**	**34,254**	**24,324**	**17,024**	**26,190**	**32,767**

Source ADF&G Division of Subsistence household surveys, 2022.

Note Bold, italic text indicates Bayesian estimates.

a. Dashes indicate that harvest was not estimated and could not be generated using Bayesian imputation due to lack of data.

b. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

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APPENDIX B–SURVEY INSTRUMENTS, 2022

Date of Survey: _____ Time: _____ Person Interviewed: _____ **HHID #** **COMMUNITY:**

Relation to HH: _____ Interviewer: _____

CONFIDENTIAL INFORMATION

2022 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 try to harvest salmon or help with harvest? **YES** ☐ **NO** ☐
(includes catching or cutting salmon.)
if NO skip to PART II

Household declined to participate: ☐
Reason: _____

PART I: FISHING HOUSEHOLDS

4. Do you have a CATCH CALENDAR to turn in? YES ☐ NO ☐ Already sent in ☐ *(Is the calendar group or household harvest? Are all salmon recorded on the 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** _____ **Coho** _____ **Chum** _____ **Pink** _____

7a. How many salmon did your household harvest / keep from the group harvest? Where did you go fishing? *(Refer to map)*

Area _____ Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____

Area _____ Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____

7b. If the household fished in these areas -- **Tuluksak down, -- Bethel down -- Below Johnson --** then ask**:**
Did you try for **salmon** in the mouth of the **Johnson**, **Gweek**, **Kialik**, or **Paillek slough?** **YES** ☐ **NO** ☐ **Incidental ONLY** ☐

(if YES OR Incidental)

River _____ ☐ Above 100 yards from mouth ☐ Below 100 yards from mouth Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____

River _____ ☐ Above 100 yards from mouth ☐ Below 100 yards from mouth Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____

What type of gear did you use? Set Net ☐ Mesh Size: mesh size Drift Net ☐ Mesh Size: mesh size
Hook & Line ☐ Dip Net ☐ Other: _____

Already reported on previous page (#7)
YES ☐ **NO** ☐

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

a. Hook & Line…. **YES** ☐ **NO** ☐ Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____ **Included above (#7) YES** ☐ **NO** ☐

a. Fishwheel…..... **YES** ☐ **NO** ☐ Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____ **Included above (#7) YES** ☐ **NO** ☐

a. Dipnet…..... **YES** ☐ **NO** ☐ Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____ **Included above (#7) YES** ☐ **NO** ☐

a. Other Gear Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____ **Included above (#7) YES** ☐ **NO** ☐

a. **Whitefish Net..** **YES** ☐ **NO** ☐ Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____ **Included above (#7) YES** ☐ **NO** ☐

9. Did anyone in your household lose any salmon? *(ie: bears, weather, flies, etc…)* **YES** ☐ **NO** ☐ **If, NO, skip to question 10.**

(if yes) Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____ **Included above (#7) YES** ☐ **NO** ☐

Reason(s) for loss: _____

a. Were any of the **lost** salmon fed to your dogs? *(whole fish only)* **YES** ☐ **NO** ☐
(if yes) Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____

b. Were extra fish harvested to replace those that were lost?..... **YES** ☐ **NO** ☐
(if yes) Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____ **Included above (#7) YES** ☐ **NO** ☐

…continued from previous page

10. Did your household give away any salmon that you harvested? *(not including spoiled fish)* **YES ☐ NO ☐** **If, NO, go to the to question 11.**

(if yes) Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____ **Included above (#7) YES ☐ NO ☐**

Part II - ALL HOUSEHOLDS

Ask these questions for ALL HOUSEHOLDS.

11. Did anyone in your household commercial fish for salmon? YES ☐ NO ☐ **If, NO, skip to question 12.**

(if yes) **Were any salmon retained for home use? YES ☐ NO ☐** **If, NO, skip to question 12.**

(if yes) Area _____ Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____ **Included (#7) YES ☐ NO ☐**

12a. How many dogs does your household have? _____ *(If 0, then skip to question 13.)*

12b. Did you harvest whole salmon for your dogs? YES ☐ NO ☐ Fed only scraps/heads to dogs. ☐

12c. Not including spoiled fish or fish you received, how many whole salmon did your household put up for dogs this year? *(whole fish, not incl. scraps)*

Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____ **Already reported on previous page (#7) YES ☐ NO ☐**

13. Did anyone give you salmon? YES ☐ NO ☐ **If, NO, skip to question 14.**

a. Subsistence caught Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____

b. Commercial caught Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____

c. Test fish Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____

d. Did you feed any of the fish you received to dogs? **YES ☐ NO ☐**

(if yes) Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____

14. <u>FOR NON-SALMON FISHING HOUSEHOLDS</u>: Did you catch any salmon in your summer whitefish net? YES ☐ NO ☐ Already reported on previous page (#7)?

(if yes) Chinook _____ Sockeye _____ Coho _____ Chum _____ Pink _____

15. Did your household meet their subsistence needs for salmon this year? YES ☐ NO ☐

Chinook: YES ☐ NO ☐ No need ☐ Why? _____ Chum: YES ☐ NO ☐ No need ☐ Why? _____

Sockeye: YES ☐ NO ☐ No need ☐ Why? _____ Coho: YES ☐ NO ☐ No need ☐ Why? _____

Pink: YES ☐ NO ☐ No need ☐ Why? _____

16. Additional comments.

_____

_____

_____

Surveyor comments

Completed Survey ☐ Partial Survey ☐ Phone Survey ☐ No Survey ☐ Survey Reviewed for completeness ☐

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APPENDIX C–SUBSISTENCE SALMON HARVEST CALENDAR, 2022

Congratulations 2021 survey & calendar Drawing Winners!

Win A Cash Prize!

$500 (2 households)

$250 (2 households)

$100 (18 households)

Turn in your salmon harvest calendar and/ or complete the postseason salmon survey to be entered into a drawing to win a cash prize. Double your chances of winning by completing both the survey and calendar.

To be entered into the drawing, the survey and/ or calendar must be completed and submitted by December 31, 2021. The drawing and notifications will take place by May 2022.

Quyana, Dogodinh, Tsenanh, Chin'an for your participation!

2022 Kuskokwim Area

Subsistence Salmon Harvest Calendar

How to Record Your Catch

- Record the # of fish kept by your household only, not the total # of fish caught if you fish with other households
- Do not record # of fish from commercial fishing

Circle or write in gear type.

King 10
Chum 6
Sockeye 24
Coho 11

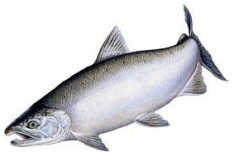
SET (DRIFT) OTHER

Mesh Size: 6”

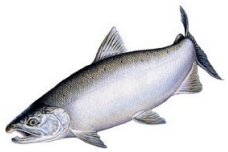
Record number of fish kept, by species.

Record mesh size.

Congratulations!



2021 Photo Contest Winners



Robert Golley Sr., Chuathbaluk

Maribeth Herron, Bethel

Lenora Nicholson, Aniak

Brenda Lindsey, Bethel

Samantha Conrad, Aniak

Helen Pollock, Bethel

2022 SUBSISTENCE FISHING PHOTO CONTEST

Send in your favorite summer 2022 subsistence fishing and fish camp photos for a chance to win 25 gallons of gas or stove oil. Up to 6 winning photos will be selected and featured in the 2023 subsistence salmon harvest calendar.

Please submit your photos by February 28th, 2023.

You can email photos to: dfg.sub.photos@alaska.gov

Questions? Please call 907-328-6103

Drying silvers at a fish camp near Bethel.

Photo: Brenda Lindsey, Bethel

May 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat

Did you catch any whitefish this month? If so, please record them here.
Ciiq (Sheefish)
Cingikeggliq (Humpback Whitefish)
Akakiik/Qaurtuq (Broad Whitefish)
Cev'eq (Round Whitefish)
Imarpinraq (Bering Cisco)
Iituliq (Least Cisco)

1 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	2 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	3 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	4 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	5 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	6 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	7 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
8 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	9 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	10 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	11 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	12 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	13 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	14 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
15 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	16 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	17 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	18 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	19 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	20 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	21 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
22 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	23 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	24 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	25 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	26 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	27 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	28 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
29 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	30 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	31 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	 Katie Basile/KYUK			

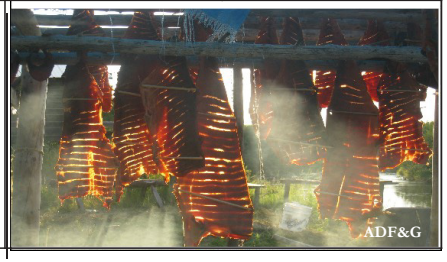
Aubree Nicholson of Aniak proudly displays her family's catch!

Photo: Lenora Nicholson, Aniak

Did you catch any whitefish this month? If so, please record them here.
Ciiq (Sheefish)
Cingikeggliq (Humpback Whitefish)
Akakiik/Qaurtuq (Broad Whitefish)
Cev'eq (Round Whitefish)
Imarpinraq (Bering Cisco)
Iituliq (Least Cisco)

June 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat

			1 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	2 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	3 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	4 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
5 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	6 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	7 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	8 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	9 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	10 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	11 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
12 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	13 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	14 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	15 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	16 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	17 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	18 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
19 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	20 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	21 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	22 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	23 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	24 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	25 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
26 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	27 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	28 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	29 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	30 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:		

Working hard at fish camp!

Photos: Helen Pollock, Bethel

Did you catch any whitefish this month? If so, please record them here.
Ciiq (Sheefish)
Cingikeggliq (Humpback Whitefish)
Akakiik/Qaurtuq (Broad Whitefish)
Cev'eq (Round Whitefish)
Imarpinraq (Bering Cisco)
Iituliq (Least Cisco)

July 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat

			1 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	2 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	1 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	2 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
3 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	4 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	5 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	6 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	7 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	8 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	9 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
10 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	11 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	12 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	13 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	14 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	15 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	16 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
17 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	18 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	19 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	20 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	21 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	22 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	23 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
24 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	25 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	26 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	27 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	28 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	29 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	30 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____

Ryan Lang of Aniak with a nice looking king!

Photo: Samantha Conrad, Aniak

Did you catch any whitefish this month? If so, please record them here.
Ciiq (Sheefish)
Cingikeggliq (Humpback Whitefish)
Akakiik/Qaurtuq (Broad Whitefish)
Cev'eq (Round Whitefish)
Imarpinraq (Bering Cisco)
Iituliq (Least Cisco)

AUGUST 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat

31 (July) King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**1** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**2** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**3** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**4** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**5** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**6** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
7 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**8** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**9** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**10** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**11** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**12** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**13** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
14 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**15** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**16** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**17** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**18** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**19** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**20** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
21 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**22** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**23** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**24** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**25** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**26** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**27** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
28 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**29** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**30** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	**31** King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____			

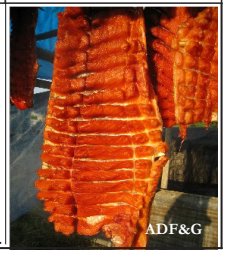
Gorgeous day on the lower Kuskokwim!

Photo: Maribeth Herron, Bethel

September 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat

Did you catch any whitefish this month? If so, please record them here.
Ciiq (Sheefish)
Cingikeggliq (Humpback Whitefish)
Akakiik/Qaurtuq (Broad Whitefish)
Cev'eq (Round Whitefish)
Imarpinraq (Bering Cisco)
Iituliq (Least Cisco)

				1 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	2 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	3 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
4 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	5 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	6 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	7 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	8 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	9 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	10 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
11 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	12 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	13 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	14 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	15 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	16 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	17 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
18 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	19 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	20 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	21 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	22 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	23 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	24 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____
25 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	26 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	27 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	28 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	29 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	30 King_____ Chum_____ Sockeye_____ Coho_____ SET DRIFT OTHER Mesh Size:_____	

James Sakar Jr. of Chuathbaluk having a blast rod and reeling!

Photo: Robert Golley Jr., Chuathbaluk

Did you catch any whitefish this month? If so, please record them here.
Ciiq (Sheefish)
Cingikeggliq (Humpback Whitefish)
Akakiik/Qaurtuq (Broad Whitefish)
Cev'eq (Round Whitefish)
Imarpinraq (Bering Cisco)
Iituliq (Least Cisco)

October 2022

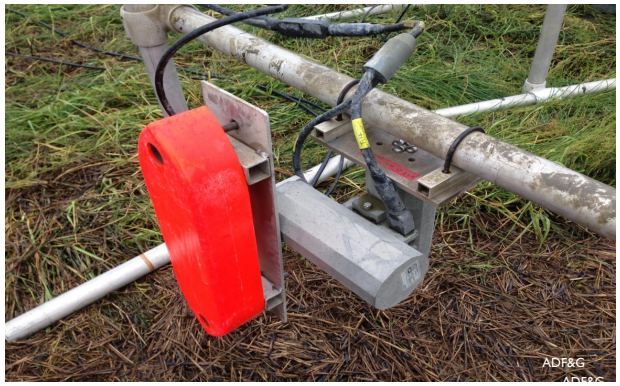
Sun	Mon	Tue	Wed	Thu	Fri	Sat

						1 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
2 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	3 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	4 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	5 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	6 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	7 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	8 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
9 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	10 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	11 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	12 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	13 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	14 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	15 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
16 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	17 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	18 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	19 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	20 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	21 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	22 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
23 King Chum Sockeye Coho	24 King Chum Sockeye Coho	25 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	26 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	27 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	28 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:	29 King Chum Sockeye Coho SET DRIFT OTHER Mesh Size:
30 King Chum Sockeye Coho	31 King Chum Sockeye Coho					

Kuskokwim River Sonar

ADF&G will be estimating salmon and whitefish passage from June 1st to August 26th, just below the "Y" near the up-river end of Napaskiak Slough.

We encourage anyone who wants to learn about sonar operations to stop by the camp between 9am and 8pm for a tour! Please avoid all buoy markers when arriving/passing camp as delicate sonar pods (see photo at right) are submerged at these locations .



Fish Distribution

We will be gillnetting in front of the sonar pods to determine the species of fish that pass the sonar. Any fish harvested will be stored on ice and delivered to the Kwethluk fish tote or local fish camps between 7:30 pm and 8:30 pm. Due to time constraints, we will only be able to make deliveries to nearby locations. If the FREE FISH sign is up on the dock at the sonar camp, please stop by and someone will meet you to help take fish! There are almost always fish available late-June to mid-July.

Please call/text 907-545-1843 after May 24th to join the notification list if you are interested in receiving fish.
Text notifications are sent 15-30 minutes prior to Kwethluk drops.

Tape Here To Close

Tape Here To Close

APPENDIX D–EXPANDED SALMON HARVEST ESTIMATES, 2022

Table D-1.– Estimated harvest of Chinook salmon by household harvest group, surveyed communities, Kuskokwim Management Area, 2022.

Community	Household harvest groups: Light harvester				Medium harvester				High harvester				Does not usually harvest				Unknown				Combined harvest groups			
	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Estimated total	95% CI
Kongiganak[a]	62	0	–	–	12	0	–	–	2	0	–	–	14	0	–	–	0	0	–	–	90	0	–	–
North Kuskokwim Bay	**62**	**0**	**–**	**–**	**12**	**0**	**–**	**–**	**2**	**0**	**–**	**–**	**14**	**0**	**–**	**–**	**0**	**0**	**–**	**–**	**90**	**0**	**–**	**–**
Tuntutuliak	43	10	14	214	22	12	33	122	13	10	58	121	35	3	3	112	13	4	14	102	126	39	2,361	646
Eek[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	98	29	13	260	98	29	1,281	532
Kasigluk	40	18	5	64	25	11	30	116	6	4	65	113	35	12	5	86	3	3	6	0	109	48	1,532	408
Nunapitchuk	43	11	13	189	21	12	38	79	21	14	51	135	42	13	0	0	4	4	22	0	131	54	2,493	507
Atmautluak	13	2	8	90	20	12	16	61	8	4	38	80	21	3	0	0	0	0	0	0	69	21	728	369
Napakiak[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	111	27	7	194	111	27	806	398
Napaskiak	28	6	16	139	22	10	7	46	10	7	47	66	35	2	8	170	21	7	4	48	116	32	1,453	697
Oscarville	0	0	0	0	7	5	5	8	0	0	0	0	4	3	5	10	4	3	1	2	21	11	58	34
Bethel	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,795	369	7	1,511	1,795	369	12,639	2,972
Kwethluk	59	23	6	86	23	15	26	100	19	10	45	105	64	17	1	34	17	9	4	25	182	74	1,963	352
Akiachak	61	11	17	363	33	13	29	141	13	8	50	84	64	3	3	208	0	0	0	0	177	35	2,834	958
Akiak	31	6	17	108	18	7	11	65	14	6	42	173	28	5	0	5	0	0	0	0	92	24	1,321	476
Tuluksak	36	15	2	21	14	11	19	53	11	9	42	55	36	6	2	45	8	5	1	1	105	46	866	188
Lower Kuskokwim River	**354**	**102**	**11**	**514**	**205**	**108**	**23**	**278**	**115**	**72**	**48**	**328**	**364**	**67**	**3**	**309**	**2,074**	**460**	**7**	**1,550**	**3,132**	**809**	**30,334**	**3,373**
Lower Kalskag	39	5	16	361	8	6	17	20	2	2	70	0	37	6	0	6	10	3	0	0	96	22	923	1,000
Upper Kalskag	21	5	6	54	3	1	25	0	6	3	56	152	22	6	8	106	3	1	23	0	55	16	783	505
Aniak	72	15	7	230	13	6	15	73	6	4	50	84	57	10	2	59	14	5	0	0	162	40	1,128	545
Chuathbaluk	20	12	1	12	6	6	13	0	1	1	170	0	3	1	0	0	0	0	0	0	30	20	277	26
Middle Kuskokwim River	**152**	**37**	**9**	**431**	**30**	**19**	**16**	**75**	**15**	**10**	**63**	**174**	**119**	**23**	**3**	**121**	**27**	**9**	**3**	**0**	**343**	**98**	**3,111**	**1,062**
Crooked Creek	11	8	7	17	5	5	36	0	2	2	13	0	13	5	0	0	6	5	0	0	37	25	292	40
Red Devil	5	4	4	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	4	19	27

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Table D-1.–Page 2 of 2.

Community	Household harvest groups: Light harvester				Medium harvester				High harvester				Does not usually harvest				Unknown				Combined harvest groups			
	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Estimated total	95% CI
Sleetmute	18	8	1	8	0	0	0	0	2	1	25	0	8	5	1	6	0	0	0	0	34	14	80	21
Stony River	7	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	4	0	0
Lime Village[a]	2	0	–	–	0	0	–	–	2	0	–	–	1	0	–	–	0	0	–	–	5	0	–	–
McGrath[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	94	32	1	41	94	32	88	83
Takotna	5	1	–	–	0	0	–	–	0	0	–	–	19	4	–	–	0	0	–	–	24	5	–	–
Nikolai[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	31	21	7	50	31	21	210	104
Upper Kuskokwim River	**48**	**24**	**3**	**20**	**6**	**6**	**30**	**0**	**6**	**3**	**19**	**0**	**41**	**14**	**0**	**6**	**131**	**58**	**2**	**64**	**246**	**105**	**689**	**136**
Kuskokwim River Total[c]	**554**	**163**	**10**	**671**	**241**	**133**	**23**	**288**	**136**	**85**	**49**	**371**	**524**	**104**	**2**	**332**	**2,232**	**527**	**7**	**1,551**	**3,721**	**1,012**	**34,134**	**3,509**
Quinhagak	77	23	18	219	35	25	30	97	22	13	47	178	43	8	9	226	18	7	9	58	195	76	4,004	767
Goodnews Bay	41	7	15	206	8	5	26	66	2	2	72	0	0	0	0	0	8	2	0	0	83	16	963	509
Platinum	10	6	3	21	3	2	4	7	2	1	85	0	0	0	0	0	2	1	0	0	18	10	215	55
South Kuskokwim Bay	**128**	**36**	**16**	**301**	**46**	**32**	**28**	**117**	**26**	**16**	**52**	**178**	**43**	**8**	**9**	**226**	**28**	**10**	**6**	**58**	**296**	**102**	**5,182**	**881**
Kuskokwim Area Total	**744**	**199**	**11**	**736**	**299**	**165**	**23**	**311**	**164**	**101**	**49**	**411**	**581**	**112**	**3**	**401**	**2,260**	**537**	**7**	**1,552**	**4,107**	**1,114**	**39,316**	**3,612**

Source ADF&G Division of Subsistence household surveys, 2022.

Note This table depicts only expanded harvest estimates by community. It does not include Bayesian estimates for unsurveyed communities and communities for which the sample was too limited. For full annual harvest estimate see Table 3-2 and Appendix Table-A1.

Note Dashes indicate that data are unavailable or not applicable for this year.

Note Household pre-season use-group classifications were evaluated based on 2022 harvests. Twenty-one households were re-classified into higher-harvesting use groups based on 2022 harvest levels if 1) their harvest was more then two standard deviations above the mean for the strata group and 2) sampling goals for the strata group were not met. New households or households classified as having 'Unknown' harvest levels were not reclassified.

a. No surveys were conducted in these communities.

b. ANOVA means tests from use-group classification were not significant at the 95% level. Estimates were derived from a single community mean.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table D-2.– Estimated harvest of chum salmon by household harvest group, surveyed communities, Kuskokwim Management Area, 2022.

Community	Household harvest groups: Light harvester				Medium harvester				High harvester				Does not usually harvest				Unknown				Combined harvest groups			
	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Estimated total	95% CI
Kongiganak[a]	62	0	–	–	12	0	–	–	2	0	–	–	14	0	–	–	0	0	–	–	90	0	–	–
North Kuskokwim Bay	**62**	**0**	**–**	**–**	**12**	**0**	**–**	**–**	**2**	**0**	**–**	**–**	**14**	**0**	**–**	**–**	**0**	**0**	**–**	**–**	**90**	**0**	**–**	**–**
Tuntutuliak	43	10	6	91	22	12	13	68	13	10	26	67	35	3	1	33	13	4	6	51	126	39	1,015	296
Eek[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	98	29	8	218	98	29	795	448
Kasigluk	40	18	2	27	25	11	16	100	6	4	16	27	35	12	2	37	3	3	9	0	109	48	653	240
Nunapitchuk	43	11	5	100	21	12	10	34	21	14	11	45	42	13	0	8	4	4	1	0	131	54	669	243
Atmautluak	13	2	21	251	20	12	7	33	8	4	30	91	21	3	0	0	0	0	0	0	69	21	643	1,988
Napakiak[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	111	27	3	103	111	27	325	212
Napaskiak	28	6	6	72	22	10	9	129	10	7	12	21	35	2	2	51	21	7	3	44	116	32	594	346
Oscarville	0	0	0	0	7	5	10	24	0	0	0	0	4	3	10	20	4	3	0	0	21	11	110	77
Bethel	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,795	369	2	405	1,795	369	3,048	797
Kwethluk	59	23	3	57	23	15	4	22	19	10	15	83	64	17	0	6	17	9	1	9	182	74	544	216
Akiachak	61	11	4	132	33	13	5	65	13	8	8	35	64	3	1	42	0	0	0	0	177	35	554	329
Akiak	31	6	7	133	18	7	1	5	14	6	18	174	28	5	0	0	0	0	0	0	92	24	493	492
Tuluksak	36	15	3	46	14	11	13	36	11	9	19	31	36	6	5	66	8	5	0	0	105	46	663	197
Lower Kuskokwim River	**354**	**102**	**5**	**357**	**205**	**108**	**9**	**200**	**115**	**72**	**16**	**235**	**364**	**67**	**1**	**108**	**2,074**	**460**	**2**	**477**	**3,132**	**809**	**10,105**	**1,367**
Lower Kalskag	39	5	3	29	8	6	4	2	2	2	53	0	37	6	0	6	10	3	0	0	96	22	250	80
Upper Kalskag	21	5	6	53	3	1	10	0	6	3	1	3	22	6	2	18	3	1	0	0	55	16	193	146
Aniak	72	15	0	13	13	6	2	16	6	4	2	5	57	10	0	16	14	5	0	0	162	40	76	54
Chuathbaluk	20	12	2	20	6	6	5	0	1	1	5	0	3	1	0	0	0	0	0	0	30	20	67	44
Middle Kuskokwim River	**152**	**37**	**2**	**65**	**30**	**19**	**4**	**16**	**15**	**10**	**9**	**5**	**119**	**23**	**0**	**24**	**27**	**9**	**0**	**0**	**343**	**98**	**585**	**157**
Crooked Creek	11	8	1	4	5	5	3	0	2	2	3	0	13	5	0	0	6	5	0	0	37	25	33	9
Red Devil	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	4	0	0

-continued-

Table D-2.–Page 2 of 2.

Community	Household harvest groups: Light harvester				Medium harvester				High harvester				Does not usually harvest				Unknown				Combined harvest groups			
	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Estimated total	95% CI
Sleetmute	18	8	0	0	0	0	0	0	2	1	0	0	8	5	0	0	0	0	0	0	34	14	0	0
Stony River	7	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	4	0	0
Lime Village[a]	2	0	–	–	0	0	–	–	2	0	–	–	1	0	–	–	0	0	–	–	5	0	–	–
McGrath[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	94	32	1	72	94	32	97	146
Takotna	5	1	–	–	0	0	–	–	0	0	–	–	19	4	–	–	0	0	–	–	24	5	–	–
Nikolai[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	31	21	0	0	31	21	0	0
Upper Kuskokwim River	**48**	**24**	**0**	**4**	**6**	**6**	**3**	**0**	**6**	**3**	**2**	**0**	**41**	**14**	**0**	**0**	**131**	**58**	**1**	**72**	**246**	**105**	**130**	**146**
Kuskokwim River Total[c]	**554**	**163**	**4**	**363**	**241**	**133**	**8**	**201**	**136**	**85**	**15**	**235**	**524**	**104**	**1**	**111**	**2,232**	**527**	**2**	**482**	**3,721**	**1,012**	**10,821**	**1,381**
Quinhagak	77	23	5	80	35	25	10	54	22	13	42	234	43	8	1	39	18	7	7	49	195	76	1,832	548
Goodnews Bay	41	7	0	5	8	5	1	4	2	2	6	0	0	0	0	0	8	2	0	0	83	16	26	15
Platinum	10	6	1	7	3	2	0	0	2	1	75	0	0	0	0	0	2	1	0	0	18	10	162	19
South Kuskokwim Bay	**128**	**36**	**3**	**80**	**46**	**32**	**8**	**55**	**26**	**16**	**41**	**234**	**43**	**8**	**1**	**39**	**28**	**10**	**5**	**49**	**296**	**102**	**2,019**	**549**
Kuskokwim Area Total	**190**	**199**	**4**	**372**	**299**	**165**	**8**	**208**	**164**	**101**	**19**	**332**	**581**	**112**	**1**	**117**	**2,260**	**537**	**2**	**485**	**4,107**	**1,114**	**12,840**	**1,470**

Source ADF&G Division of Subsistence household surveys, 2022.

Note This table depicts only expanded harvest estimates by community. It does not include Bayesian estimates for unsurveyed communities and communities for which the sample was too limited. For full annual harvest estimate see Table 3-2 and Appendix Table-A2.

Note Dashes indicate that data are unavailable or not applicable for this year.

Note Household pre-season use-group classifications were evaluated based on 2022 harvests. Twenty-one households were re-classified into higher-harvesting use groups based on 2022 harvest levels if 1) their harvest was more then two standard deviations above the mean for the strata group and 2) sampling goals for the strata group were not met. New households or households classified as having 'Unknown' harvest levels were not reclassified.

a. No surveys were conducted in these communities.

b. ANOVA means tests from use-group classification were not significant at the 95% level. Estimates were derived from a single community mean.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table D-3.– Estimated harvest of sockeye salmon by household harvest group, surveyed communities, Kuskokwim Management Area, 2022.

Community	Household harvest groups																							
	Light harvester				Medium harvester				High harvester				Does not usually harvest				Unknown				Combined harvest groups			
	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Estimated total	95% CI
Kongiganak[a]	62	0	–	–	12	0	–	–	2	0	–	–	14	0	–	–	0	0	–	–	90	0	–	–
North Kuskokwim Bay	**62**	**0**	**–**	**–**	**12**	**0**	**–**	**–**	**2**	**0**	**–**	**–**	**14**	**0**	**–**	**–**	**0**	**0**	**–**	**–**	**90**	**0**	**–**	**–**
Tuntutuliak	43	10	14	153	22	12	54	264	13	10	37	70	35	3	8	257	13	4	6	39	126	39	2,618	904
Eek[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	98	29	26	605	98	29	2,549	1,239
Kasigluk	40	18	6	66	25	11	54	175	6	4	109	287	35	12	13	142	3	3	14	0	109	48	2,723	856
Nunapitchuk	43	11	27	410	21	12	43	130	21	14	63	182	42	13	1	27	4	4	10	0	131	54	3,444	989
Atmautluak	13	2	20	239	20	12	41	136	8	4	175	468	21	3	0	0	0	0	0	0	69	21	2,482	1,444
Napakiak[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	111	27	18	681	111	27	2,013	1,400
Napaskiak	28	6	34	469	22	10	38	233	10	7	71	113	35	2	13	68	21	7	5	63	116	32	3,055	1,237
Oscarville	0	0	0	0	7	5	49	77	0	0	0	0	4	3	8	17	4	3	2	4	21	11	384	211
Bethel	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,795	369	10	2,063	1,795	369	17,249	4,056
Kwethluk	59	23	12	134	23	15	36	118	19	10	55	168	64	17	2	66	17	9	3	25	182	74	2,703	517
Akiachak	61	11	8	218	33	13	26	245	13	8	53	165	64	3	5	312	0	0	0	0	177	35	2,362	1,074
Akiak	31	6	19	154	18	7	25	166	14	6	37	121	28	5	1	20	0	0	0	0	92	24	1,589	546
Tuluksak	36	15	2	28	14	11	17	27	11	9	46	70	36	6	16	317	8	5	0	1	105	46	1,387	812
Lower Kuskokwim River	**354**	**102**	**14**	**750**	**205**	**108**	**38**	**546**	**115**	**72**	**64**	**653**	**364**	**67**	**6**	**542**	**2,074**	**460**	**11**	**2,256**	**3,132**	**809**	**44,561**	**5,077**
Lower Kalskag	39	5	2	35	8	6	25	37	2	2	16	0	37	6	0	0	10	3	0	0	96	22	316	115
Upper Kalskag	21	5	9	102	3	1	35	0	6	3	23	55	22	6	3	39	3	1	20	0	55	16	562	290
Aniak	72	15	4	146	13	6	24	112	6	4	68	183	57	10	2	67	14	5	0	0	162	40	1,117	586
Chuathbaluk	20	12	2	16	6	6	7	0	1	1	100	0	3	1	0	0	0	0	0	0	30	20	175	36
Middle Kuskokwim River	**152**	**37**	**4**	**183**	**30**	**19**	**22**	**118**	**15**	**10**	**45**	**192**	**119**	**23**	**1**	**78**	**27**	**9**	**2**	**0**	**343**	**98**	**2,170**	**633**
Crooked Creek	11	8	2	4	5	5	32	0	2	2	63	0	13	5	0	0	6	5	0	0	37	25	310	9
Red Devil	5	4	5	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	4	25	36

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Table D-3.–Page 2 of 2.

Community	Household harvest groups: Light harvester				Medium harvester				High harvester				Does not usually harvest				Unknown				Combined harvest groups			
	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Estimated total	95% CI
Sleetmute	18	8	10	52	0	0	0	0	2	1	75	0	8	5	1	7	0	0	0	0	34	14	343	123
Stony River	7	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	4	0	0
Lime Village[a]	2	0	–	–	0	0	–	–	2	0	–	–	1	0	–	–	0	0	–	–	5	0	–	–
McGrath[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	94	32	0	19	94	32	24	39
Takotna	5	1	–	–	0	0	–	–	0	0	–	–	19	4	–	–	0	0	–	–	24	5	–	–
Nikolai[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	31	21	0	0	31	21	0	0
Upper Kuskokwim River	**48**	**24**	**5**	**53**	**6**	**6**	**27**	**0**	**6**	**3**	**69**	**0**	**41**	**14**	**0**	**7**	**131**	**58**	**0**	**19**	**246**	**105**	**702**	**127**
Kuskokwim River Total[c]	**554**	**163**	**11**	**774**	**241**	**133**	**36**	**558**	**136**	**85**	**62**	**681**	**524**	**104**	**5**	**548**	**2,232**	**527**	**10**	**2,256**	**3,721**	**1,012**	**47,432**	**5,112**
Quinhagak	77	23	15	201	35	25	30	92	22	13	96	389	43	8	6	102	18	7	12	112	195	76	4,802	974
Goodnews Bay	41	7	40	311	8	5	48	106	2	2	229	0	0	0	0	0	8	2	0	0	83	16	2,460	770
Platinum	10	6	8	24	3	2	40	69	2	1	125	0	0	0	0	0	2	1	0	0	18	10	452	593
South Kuskokwim Bay	**128**	**36**	**22**	**371**	**46**	**32**	**34**	**157**	**26**	**16**	**109**	**389**	**43**	**8**	**6**	**102**	**28**	**10**	**7**	**112**	**296**	**102**	**7,714**	**1,183**
Kuskokwim Area Total	**744**	**199**	**13**	**858**	**299**	**165**	**35**	**580**	**164**	**101**	**69**	**784**	**581**	**112**	**5**	**557**	**2,260**	**537**	**10**	**2,259**	**4,107**	**1,114**	**55,146**	**5,237**

Source ADF&G Division of Subsistence household surveys, 2022.

Note This table depicts only expanded harvest estimates by community. It does not include Bayesian estimates for unsurveyed communities and communities for which the sample was too limited. For full annual harvest estimate see Table 3-2 and Appendix Table-A3.

Note Dashes indicate that data are unavailable or not applicable for this year.

Note Household pre-season use-group classifications were evaluated based on 2022 harvests. Twenty-one households were re-classified into higher-harvesting use groups based on 2022 harvest levels if 1) their harvest was more then two standard deviations above the mean for the strata group and 2) sampling goals for the strata group were not met. New households or households classified as having 'Unknown' harvest levels were not reclassified.

a. No surveys were conducted in these communities.

b. ANOVA means tests from use-group classification were not significant at the 95% level. Estimates were derived from a single community mean.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table D-4.– Estimated harvest of coho salmon by household harvest group, surveyed communities, Kuskokwim Management Area, 2022.

Community	Household harvest groups																							
	Light harvester				Medium harvester				High harvester				Does not usually harvest				Unknown				Combined harvest groups			
	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Estimated total	95% CI
Kongiganak[a]	62	0	–	–	12	0	–	–	2	0	–	–	14	0	–	–	0	0	–	–	90	0	–	–
North Kuskokwim Bay	**62**	**0**	**–**	**–**	**12**	**0**	**–**	**–**	**2**	**0**	**–**	**–**	**14**	**0**	**–**	**–**	**0**	**0**	**–**	**–**	**90**	**0**	**–**	**–**
Tuntutuliak	43	10	4	67	22	12	8	59	13	10	3	13	35	3	1	45	13	4	3	27	126	39	465	217
Eek[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	98	29	9	211	98	29	906	433
Kasigluk	40	18	0	0	25	11	12	91	6	4	3	10	35	12	5	89	3	3	4	0	109	48	513	265
Nunapitchuk	43	11	5	115	21	12	5	46	21	14	11	62	42	13	1	40	4	4	0	0	131	54	580	298
Atmautluak	13	2	11	126	20	12	2	17	8	4	69	259	21	3	0	0	0	0	0	0	69	21	733	805
Napakiak[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	111	27	6	201	111	27	617	414
Napaskiak	28	6	5	83	22	10	1	8	10	7	11	38	35	2	10	340	21	7	0	0	116	32	616	3,310
Oscarville	0	0	0	0	7	5	3	9	0	0	0	0	4	3	3	7	4	3	1	1	21	11	37	27
Bethel	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,795	369	4	944	1,795	369	6,814	1,856
Kwethluk	59	23	1	26	23	15	9	50	19	10	28	150	64	17	0	13	17	9	0	0	182	74	824	351
Akiachak	61	11	2	85	33	13	5	61	13	8	16	56	64	3	3	208	0	0	0	0	177	35	723	706
Akiak	31	6	6	53	18	7	7	51	14	6	13	101	28	5	0	0	0	0	0	0	92	24	475	276
Tuluksak	36	15	2	46	14	11	5	20	11	9	16	28	36	6	0	11	8	5	9	45	105	46	423	153
Lower Kuskokwim River	**354**	**102**	**3**	**231**	**205**	**108**	**6**	**153**	**115**	**72**	**18**	**330**	**364**	**67**	**2**	**413**	**2,074**	**460**	**4**	**990**	**3,132**	**809**	**13,726**	**2,294**
Lower Kalskag	39	5	2	73	8	6	2	2	2	2	33	0	37	6	0	0	10	3	0	0	96	22	163	202
Upper Kalskag	21	5	6	73	3	1	0	0	6	3	0	0	22	6	1	19	3	1	0	0	55	16	148	201
Aniak	72	15	7	318	13	6	3	32	6	4	5	16	57	10	1	26	14	5	0	0	162	40	612	686
Chuathbaluk	20	12	0	2	6	6	0	0	1	1	0	0	3	1	0	0	0	0	0	0	30	20	7	5
Middle Kuskokwim River	**152**	**37**	**5**	**334**	**30**	**19**	**2**	**32**	**15**	**10**	**6**	**16**	**119**	**23**	**0**	**32**	**27**	**9**	**0**	**0**	**343**	**98**	**931**	**711**
Crooked Creek	11	8	0	0	5	5	13	0	2	2	0	0	13	5	0	0	6	5	0	0	37	25	68	0
Red Devil	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	4	0	0

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Table D-4.–Page 2 of 2.

Community	Household harvest groups: Light harvester				Medium harvester				High harvester				Does not usually harvest				Unknown				Combined harvest groups			
	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Estimated total	95% CI
Sleetmute	18	8	4	37	0	0	0	0	2	1	2	0	8	5	1	7	0	0	0	0	34	14	85	87
Stony River	7	3	0	0	1	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	14	4	10	0
Lime Village[a]	2	0	–	–	0	0	–	–	2	0	–	–	1	0	–	–	0	0	–	–	5	0	–	–
McGrath[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	94	32	4	222	94	32	411	453
Takotna	5	1	–	–	0	0	–	–	0	0	–	–	19	4	–	–	0	0	–	–	24	5	–	–
Nikolai[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	31	21	0	0	31	21	0	0
Upper Kuskokwim River	**48**	**24**	**2**	**37**	**6**	**6**	**13**	**0**	**6**	**3**	**1**	**0**	**41**	**14**	**0**	**7**	**131**	**58**	**3**	**222**	**246**	**105**	**574**	**458**
Kuskokwim River Total[c]	**554**	**163**	**3**	**408**	**241**	**133**	**6**	**157**	**136**	**85**	**16**	**331**	**524**	**104**	**2**	**414**	**2,232**	**527**	**4**	**1,014**	**3,721**	**1,012**	**15,231**	**2,426**
Quinhagak	77	23	7	134	35	25	10	48	22	13	22	214	43	8	2	48	18	7	4	23	195	76	1,508	541
Goodnews Bay	41	7	3	56	8	5	2	7	2	2	10	0	0	0	0	0	8	2	0	0	83	16	162	136
Platinum	10	6	1	5	3	2	5	9	2	1	20	0	0	0	0	0	2	1	25	0	18	10	113	48
South Kuskokwim Bay	**128**	**36**	**5**	**145**	**46**	**32**	**8**	**50**	**26**	**16**	**21**	**214**	**43**	**8**	**2**	**48**	**28**	**10**	**4**	**23**	**296**	**102**	**1,783**	**551**
Kuskokwim Area Total	**744**	**199**	**4**	**433**	**299**	**165**	**6**	**164**	**164**	**101**	**17**	**394**	**581**	**112**	**2**	**417**	**2,260**	**537**	**4**	**1,014**	**4,107**	**1,114**	**17,014**	**2,482**

Source ADF&G Division of Subsistence household surveys, 2022.

Note This table depicts only expanded harvest estimates by community. It does not include Bayesian estimates for unsurveyed communities and communities for which the sample was too limited. For full annual harvest estimate see Table 3-2 and Appendix Table-A4.

Note Dashes indicate that data are unavailable or not applicable for this year.

Note Household pre-season use-group classifications were evaluated based on 2022 harvests. Twenty-one households were re-classified into higher-harvesting use groups based on 2022 harvest levels if 1) their harvest was more then two standard deviations above the mean for the strata group and 2) sampling goals for the strata group were not met. New households or households classified as having 'Unknown' harvest levels were not reclassified.

a. No surveys were conducted in these communities.

b. ANOVA means tests from use-group classification were not significant at the 95% level. Estimates were derived from a single community mean.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

Table D-5.– Estimated harvest of chum salmon by household harvest group, surveyed communities, Kuskokwim Management Area, 2022.

Community	Household harvest groups: Light harvester				Medium harvester				High harvester				Does not usually harvest				Unknown				Combined harvest groups			
	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Estimated total	95% CI
Kongiganak[a]	62	0	–	–	12	0	–	–	2	0	–	–	14	0	–	–	0	0	–	–	90	0	–	–
North Kuskokwim Bay	**62**	**0**	**–**	**–**	**12**	**0**	**–**	**–**	**2**	**0**	**–**	**–**	**14**	**0**	**–**	**–**	**0**	**0**	**–**	**–**	**90**	**0**	**–**	**–**
Tuntutuliak	43	10	0	0	22	12	0	2	13	10	0	0	35	3	0	0	13	4	0	0	126	39	14	5
Eek[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	98	29	0	10	98	29	18	21
Kasigluk	40	18	0	0	25	11	0	0	6	4	1	2	35	12	0	2	3	3	1	0	109	48	8	6
Nunapitchuk	43	11	2	84	21	12	0	1	21	14	0	5	42	13	0	0	4	4	0	0	131	54	109	188
Atmautluak	13	2	2	18	20	12	0	1	8	4	2	8	21	3	0	0	0	0	0	0	69	21	33	122
Napakiak[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	111	27	0	16	111	27	25	32
Napaskiak	28	6	0	0	22	10	1	8	10	7	0	0	35	2	0	0	21	7	0	0	116	32	14	18
Oscarville	0	0	0	0	7	5	0	0	0	0	0	0	4	3	0	0	4	3	0	0	21	11	0	0
Bethel	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,795	369	0	73	1,795	369	240	143
Kwethluk	59	23	0	16	23	15	1	9	19	10	1	14	64	17	0	0	17	9	0	0	182	74	68	47
Akiachak	61	11	0	0	33	13	0	0	13	8	1	5	64	3	0	21	0	0	0	0	177	35	29	83
Akiak	31	6	2	56	18	7	0	0	14	6	0	2	28	5	0	0	0	0	0	0	92	24	79	143
Tuluksak	36	15	2	46	14	11	1	6	11	9	4	9	36	6	0	0	8	5	0	0	105	46	123	100
Lower Kuskokwim River	**354**	**102**	**1**	**114**	**205**	**108**	**0**	**14**	**115**	**72**	**1**	**21**	**364**	**67**	**0**	**21**	**2,074**	**460**	**0**	**75**	**3,132**	**809**	**760**	**281**
Lower Kalskag	39	5	1	27	8	6	1	3	2	2	0	0	37	6	0	0	10	3	0	0	96	22	53	74
Upper Kalskag	21	5	5	92	3	1	0	0	6	3	0	0	22	6	0	0	3	1	0	0	55	16	105	254
Aniak	72	15	0	0	13	6	0	0	6	4	0	0	57	10	0	0	14	5	0	0	162	40	0	0
Chuathbaluk	20	12	0	0	6	6	0	0	1	1	0	0	3	1	0	0	0	0	0	0	30	20	1	0
Middle Kuskokwim River	**152**	**37**	**1**	**95**	**30**	**19**	**0**	**3**	**15**	**10**	**0**	**0**	**119**	**23**	**0**	**0**	**27**	**9**	**0**	**0**	**343**	**98**	**159**	**251**
Crooked Creek	11	8	0	0	5	5	0	0	2	2	0	0	13	5	0	0	6	5	0	0	37	25	0	0
Red Devil	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	4	0	0

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Table D-5.–Page 2 of 2.

Community	Household harvest groups: Light harvester				Medium harvester				High harvester				Does not usually harvest				Unknown				Combined harvest groups			
	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Mean	Standard error	Total households	Surveyed households	Estimated total	95% CI
Sleetmute	18	8	0	0	0	0	0	0	2	1	0	0	8	5	0	0	0	0	0	0	34	14	0	0
Stony River	7	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	4	0	0
Lime Village[a]	2	0	–	–	0	0	–	–	2	0	–	–	1	0	–	–	0	0	–	–	5	0	–	–
McGrath[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	94	32	0	2	94	32	3	5
Takotna	5	1	–	–	0	0	–	–	0	0	–	–	19	4	–	–	0	0	–	–	24	5	–	–
Nikolai[b]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	31	21	0	0	31	21	0	0
Upper Kuskokwim River	**48**	**24**	**0**	**0**	**6**	**6**	**0**	**0**	**6**	**3**	**0**	**0**	**41**	**14**	**0**	**0**	**131**	**58**	**0**	**2**	**246**	**105**	**3**	**5**
Kuskokwim River Total[c]	**554**	**163**	**1**	**148**	**241**	**133**	**0**	**15**	**136**	**85**	**1**	**21**	**524**	**104**	**0**	**21**	**2,232**	**527**	**0**	**75**	**3,721**	**1,012**	**923**	**345**
Quinhagak	77	23	1	28	35	25	0	0	22	13	1	11	43	8	0	0	18	7	0	0	195	76	107	62
Goodnews Bay	41	7	0	11	8	5	1	5	2	2	8	0	0	0	0	0	8	2	0	0	83	16	41	28
Platinum	10	6	0	0	3	2	0	0	2	1	2	0	0	0	0	0	2	1	0	0	18	10	4	0
South Kuskokwim Bay	**128**	**36**	**1**	**30**	**46**	**32**	**0**	**5**	**26**	**16**	**2**	**11**	**43**	**8**	**0**	**0**	**28**	**10**	**0**	**0**	**296**	**102**	**152**	**66**
Kuskokwim Area Total	**744**	**199**	**1**	**151**	**299**	**165**	**0**	**15**	**164**	**101**	**1**	**23**	**581**	**112**	**0**	**21**	**2,260**	**537**	**0**	**75**	**4,107**	**1,114**	**1,074**	**350**

Source ADF&G Division of Subsistence household surveys, 2022.

Note This table depicts only expanded harvest estimates by community. It does not include Bayesian estimates for unsurveyed communities and communities for which the sample was too limited. For full annual harvest estimate see Table 3-2 and Appendix A1.

Note Dashes indicate that data are unavailable or not applicable for this year.

Note Household pre-season use-group classifications were evaluated based on 2022 harvests. Twenty-one households were re-classified into higher-harvesting use groups based on 2022 harvest levels if 1) their harvest was more then two standard deviations above the mean for the strata group and 2) sampling goals for the strata group were not met. New households or households classified as having 'Unknown' harvest levels were not reclassified.

a. No surveys were conducted in these communities.

b. ANOVA means tests from use-group classification were not significant at the 95% level. Estimates were derived from a single community mean.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

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APPENDIX E–SUBSISTENCE SALMON NEEDS, 2022

Table E1.–Comments provided by survey participants regarding whether or not their subsistence needs for Chinook salmon were met, surveyed communities, Kuskokwim Management Area, 2022.

Community	Total households	Valid responses	Percentage of households: Needs met	No need	Needs not met
Kongiganak[a]	90	–	–	–	–
North Kuskokwim Bay	**90**	**–**	**–**	**–**	**–**
Tuntutuliak	126	39	54%	0%	46%
Eek	98	29	55%	3%	41%
Kasigluk	109	48	38%	0%	63%
Nunapitchuk	131	53	38%	4%	58%
Atmautluak	69	21	38%	0%	62%
Napakiak	111	25	24%	0%	76%
Napaskiak	116	31	42%	6%	52%
Oscarville	21	11	27%	18%	55%
Bethel	1,795	350	44%	9%	46%
Kwethluk	182	73	34%	3%	63%
Akiachak	177	34	56%	6%	38%
Akiak	92	24	33%	0%	67%
Tuluksak	105	46	22%	7%	72%
Lower Kuskokwim River	**3,132**	**784**	**41%**	**6%**	**53%**
Lower Kalskag	96	21	24%	5%	71%
Upper Kalskag	55	16	50%	0%	50%
Aniak	162	40	18%	23%	60%
Chuathbaluk	30	19	47%	11%	42%
Middle Kuskokwim River	**343**	**96**	**30%**	**13%**	**57%**
Crooked Creek	37	24	33%	13%	54%
Red Devil	7	4	25%	50%	25%
Sleetmute	34	14	21%	29%	50%
Stony River	14	4	50%	0%	50%
Lime Village[a]	5	–	–	–	–
McGrath	94	32	19%	22%	59%
Takotna	24	5	0%	20%	80%
Nikolai	31	21	19%	10%	71%
Upper Kuskokwim River[b]	**246**	**104**	**23%**	**18%**	**59%**
Kuskokwim River Total[b,c]	**3,721**	**984**	**38%**	**8%**	**54%**
Quinhagak	195	75	71%	1%	28%
Goodnews Bay	83	15	60%	0%	40%
Platinum	18	10	30%	20%	50%
South Kuskokwim Bay	**296**	**100**	**65%**	**3%**	**32%**
Kuskokwim Area Total[b]	**4,017**	**1,084**	**41%**	**7%**	**52%**

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Table E1.–Page 2 of 4.

Community	Percentage of household reasons for not meeting needs						
	Did Not Fish	Personal	Equipment	Expenses	Management	Run Dynamics	River Conditions
Kongiganak[a]	–	–	–	–	–	–	–
North Kuskokwim Bay	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	0%	22%	6%	0%	56%	11%	0%
Eek	0%	50%	0%	0%	17%	25%	0%
Kasigluk	7%	37%	10%	3%	17%	7%	0%
Nunapitchuk	0%	19%	23%	3%	16%	19%	0%
Atmautluak	15%	38%	23%	0%	15%	23%	0%
Napakiak	0%	21%	11%	0%	32%	21%	0%
Napaskiak	6%	19%	0%	0%	50%	19%	0%
Oscarville	0%	0%	33%	0%	17%	33%	0%
Bethel	14%	20%	16%	1%	13%	13%	0%
Kwethluk	2%	24%	17%	0%	39%	7%	2%
Akiachak	0%	8%	0%	0%	77%	15%	0%
Akiak	0%	25%	13%	0%	25%	0%	6%
Tuluksak	0%	30%	21%	3%	33%	15%	6%
Lower Kuskokwim River	**7%**	**24%**	**15%**	**1%**	**25%**	**13%**	**1%**
Lower Kalskag	0%	53%	33%	0%	7%	20%	0%
Upper Kalskag	0%	38%	50%	0%	25%	13%	0%
Aniak	13%	17%	25%	0%	21%	17%	0%
Chuathbaluk	0%	25%	13%	13%	38%	0%	0%
Middle Kuskokwim River	**5%**	**31%**	**29%**	**2%**	**20%**	**15%**	**0%**
Crooked Creek	0%	31%	15%	8%	15%	31%	0%
Red Devil	0%	100%	0%	0%	0%	0%	0%
Sleetmute	14%	43%	43%	0%	14%	14%	0%
Stony River	50%	50%	0%	0%	50%	0%	0%
Lime Village[a]	–	–	–	–	–	–	–
McGrath	16%	21%	5%	0%	32%	5%	0%
Takotna	0%	75%	0%	0%	25%	0%	0%
Nikolai	7%	27%	0%	0%	13%	67%	0%
Upper Kuskokwim River[b]	**10%**	**33%**	**10%**	**2%**	**21%**	**26%**	**0%**
Kuskokwim River Total[b,c]	**7%**	**25%**	**16%**	**1%**	**24%**	**15%**	**1%**
Quinhagak	10%	29%	10%	5%	0%	33%	0%
Goodnews Bay	0%	17%	17%	17%	0%	17%	0%
Platinum	20%	40%	0%	0%	0%	0%	0%
South Kuskokwim Bay	**9%**	**28%**	**9%**	**6%**	**0%**	**25%**	**0%**
Kuskokwim Area Total[b]	**7%**	**26%**	**15%**	**2%**	**23%**	**16%**	**1%**

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Table E1.–Page 3 of 4.

Community	Percentage of household reasons for not meeting needs								
	Weather	Conservation	Human	Animal	Environmental	COVID	Not Enough Sharing	Other	Reason Unknown[d]
Kongiganak[a]	–	–	–						
North Kuskokwim Bay	**–**	**–**	**–**						
Tuntutuliak	6%	0%	0%	0%	0%	6%	0%	6%	83%
Eek	0%	0%	8%	0%	0%	0%	8%	0%	75%
Kasigluk	3%	0%	7%	0%	0%	0%	3%	10%	87%
Nunapitchuk	0%	0%	3%	0%	3%	0%	10%	6%	84%
Atmautluak	0%	0%	0%	0%	0%	0%	0%	8%	77%
Napakiak	5%	0%	0%	0%	0%	0%	5%	5%	95%
Napaskiak	0%	0%	0%	0%	0%	0%	0%	0%	81%
Oscarville	17%	0%	0%	0%	0%	0%	0%	17%	83%
Bethel	**1%**	**0%**	**1%**	**1%**	**0%**	**0%**	**2%**	**5%**	**90%**
Kwethluk	0%	2%	2%	2%	0%	0%	2%	4%	89%
Akiachak	0%	0%	0%	0%	0%	0%	0%	0%	92%
Akiak	0%	0%	0%	0%	0%	0%	0%	0%	94%
Tuluksak	0%	0%	6%	3%	0%	0%	0%	3%	70%
Lower Kuskokwim River	**1%**	**0%**	**2%**	**1%**	**0%**	**0%**	**3%**	**5%**	**87%**
Lower Kalskag	0%	0%	0%	0%	0%	0%	0%	0%	87%
Upper Kalskag	0%	0%	0%	0%	0%	0%	0%	0%	75%
Aniak	0%	8%	0%	0%	0%	0%	4%	0%	83%
Chuathbaluk	0%	0%	0%	0%	0%	0%	13%	0%	100%
Middle Kuskokwim River	**0%**	**4%**	**0%**	**0%**	**0%**	**0%**	**4%**	**0%**	**85%**
Crooked Creek	15%	0%	0%	0%	0%	0%	8%	0%	77%
Red Devil	0%	0%	0%	0%	0%	0%	0%	0%	100%
Sleetmute	0%	0%	0%	0%	0%	0%	14%	0%	57%
Stony River	0%	0%	0%	0%	0%	0%	0%	0%	50%
Lime Village[a]	–	–	–	–	–	–	–	–	–
McGrath	0%	5%	0%	0%	0%	0%	16%	0%	84%
Takotna	0%	0%	0%	0%	0%	0%	0%	0%	100%
Nikolai	7%	0%	0%	0%	0%	0%	0%	0%	80%
Upper Kuskokwim River[b]	**5%**	**2%**	**0%**	**0%**	**0%**	**0%**	**8%**	**0%**	**79%**
Kuskokwim River Total[b,c]	**2%**	**1%**	**2%**	**1%**	**0%**	**0%**	**3%**	**4%**	**85%**
Quinhagak	0%	0%	5%	0%	0%	0%	0%	0%	95%
Goodnews Bay	0%	0%	0%	0%	0%	0%	0%	17%	83%
Platinum	0%	0%	0%	0%	20%	0%	0%	0%	100%
South Kuskokwim Bay	**0%**	**0%**	**3%**	**0%**	**3%**	**0%**	**0%**	**3%**	**94%**
Kuskokwim Area Total[b]	**1%**	**1%**	**2%**	**1%**	**0%**	**0%**	**3%**	**4%**	**86%**

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Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are unavailable.

a. No surveys were conducted in these communities.

b. Percentages in subtotals only include communities where data is available.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

d. Reason Unknown includes irrelevant responses, such as "Didn't get enough." Most respondents provided comments on reasons for not getting enough, but they were non-specific and could not be coded into categorical responses; these have been coded as "Unknown reason."

Table E2.–Comments provided by survey participants regarding whether or not their subsistence needs for chum salmon were met, surveyed communities, Kuskokwim Management Area, 2022

Community	Total households	Valid responses	Percentage of households: Needs met	No need	Needs not met
Kongiganak[a]	90	–	–	–	–
North Kuskokwim Bay	**90**	**–**	**–**	**–**	**–**
Tuntutuliak	126	39	44%	3%	54%
Eek	98	27	33%	7%	59%
Kasigluk	109	48	29%	2%	69%
Nunapitchuk	131	53	42%	6%	53%
Atmautluak	69	21	33%	0%	67%
Napakiak	111	26	27%	4%	69%
Napaskiak	116	31	23%	13%	65%
Oscarville	21	11	27%	36%	36%
Bethel	1,795	348	36%	18%	46%
Kwethluk	182	70	17%	9%	74%
Akiachak	177	34	26%	12%	62%
Akiak	92	24	29%	4%	67%
Tuluksak	105	46	22%	4%	74%
Lower Kuskokwim River	**3,132**	**778**	**32%**	**12%**	**56%**
Lower Kalskag	96	22	9%	23%	68%
Upper Kalskag	55	16	38%	19%	44%
Aniak	162	40	5%	35%	60%
Chuathbaluk	30	19	37%	21%	42%
Middle Kuskokwim River	**343**	**97**	**18%**	**27%**	**56%**
Crooked Creek	37	24	8%	29%	63%
Red Devil	7	4	25%	25%	50%
Sleetmute	34	14	7%	71%	21%
Stony River	14	4	50%	0%	50%
Lime Village[a]	5	–	–	–	–
McGrath	94	32	22%	16%	63%
Takotna	24	5	0%	60%	40%
Nikolai	31	21	5%	71%	24%
Upper Kuskokwim River[b]	**246**	**104**	**13%**	**39%**	**47%**
Kuskokwim River Total[b,c]	**3,721**	**979**	**28%**	**16%**	**55%**
Quinhagak	195	75	52%	23%	25%
Goodnews Bay	83	13	23%	46%	31%
Platinum	18	10	30%	60%	10%
South Kuskokwim Bay	**296**	**98**	**46%**	**30%**	**24%**
Kuskokwim Area Total[b]	**4,107**	**1,077**	**30%**	**18%**	**52%**

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Table E2.–Page 2 of 4.

Community	Did Not Fish	Personal	Equipment	Expenses	Management	Run Dynamics	River Conditions
	Percentage of household reasons for not meeting needs						
Kongiganak[a]	–	–	–	–	–	–	–
North Kuskokwim Bay	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	0%	5%	5%	0%	43%	5%	0%
Eek	0%	25%	0%	6%	13%	13%	0%
Kasigluk	6%	33%	9%	3%	12%	3%	0%
Nunapitchuk	0%	18%	25%	4%	14%	14%	0%
Atmautluak	14%	29%	14%	0%	7%	7%	0%
Napakiak	6%	17%	6%	0%	11%	6%	0%
Napaskiak	5%	5%	5%	0%	25%	10%	0%
Oscarville	0%	0%	25%	0%	25%	0%	0%
Bethel	13%	18%	14%	1%	11%	9%	0%
Kwethluk	0%	17%	13%	0%	23%	4%	2%
Akiachak	0%	14%	5%	0%	33%	10%	5%
Akiak	0%	25%	13%	0%	19%	0%	6%
Tuluksak	0%	35%	21%	6%	29%	12%	3%
Lower Kuskokwim River	**6%**	**20%**	**13%**	**1%**	**18%**	**8%**	**1%**
Lower Kalskag	0%	53%	27%	0%	7%	20%	0%
Upper Kalskag	0%	29%	29%	0%	14%	14%	0%
Aniak	13%	13%	21%	0%	21%	17%	0%
Chuathbaluk	0%	25%	0%	0%	13%	38%	0%
Middle Kuskokwim River	**6%**	**28%**	**20%**	**0%**	**15%**	**20%**	**0%**
Crooked Creek	0%	27%	0%	7%	13%	20%	7%
Red Devil	0%	50%	0%	0%	0%	0%	0%
Sleetmute	33%	0%	67%	0%	0%	0%	0%
Stony River	50%	50%	0%	0%	50%	0%	0%
Lime Village[a]	–	–	–	–	–	–	–
McGrath	20%	20%	5%	0%	30%	5%	0%
Takotna	0%	50%	0%	0%	0%	0%	0%
Nikolai	0%	0%	0%	0%	40%	0%	0%
Upper Kuskokwim River[b]	**12%**	**22%**	**6%**	**2%**	**22%**	**8%**	**2%**
Kuskokwim River Total[b,c]	**7%**	**25%**	**16%**	**1%**	**24%**	**15%**	**1%**
Quinhagak	11%	21%	0%	5%	0%	5%	0%
Goodnews Bay	0%	25%	0%	25%	0%	0%	0%
Platinum	0%	100%	0%	0%	0%	0%	0%
South Kuskokwim Bay	**8%**	**25%**	**0%**	**8%**	**0%**	**4%**	**0%**
Kuskokwim Area Total[b]	**7%**	**21%**	**12%**	**2%**	**17%**	**9%**	**1%**

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Table E2.–Page 3 of 4.

Community	Percentage of household reasons for not meeting needs: Weather	Conservation	Human	Animal	Environmental	COVID	Not Enough Sharing	Other	Reason Unknown[d]
Kongiganak[a]	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	14%	0%	0%	0%	0%	5%	0%	5%	76%
Eek	0%	0%	6%	0%	0%	0%	6%	6%	81%
Kasigluk	3%	0%	3%	0%	0%	0%	3%	9%	88%
Nunapitchuk	0%	0%	0%	0%	4%	0%	11%	7%	86%
Atmautluak	0%	0%	0%	0%	0%	0%	0%	0%	86%
Napakiak	6%	0%	0%	0%	0%	0%	6%	0%	100%
Napaskiak	0%	0%	0%	0%	0%	0%	0%	0%	90%
Oscarville	25%	0%	0%	0%	0%	0%	0%	25%	75%
Bethel	**1%**	**0%**	**1%**	**1%**	**0%**	**0%**	**3%**	**4%**	**92%**
Kwethluk	0%	0%	2%	2%	0%	0%	2%	0%	96%
Akiachak	0%	0%	0%	0%	0%	0%	0%	0%	95%
Akiak	0%	0%	0%	0%	0%	0%	0%	0%	94%
Tuluksak	0%	0%	6%	3%	0%	0%	0%	3%	68%
Lower Kuskokwim River	**2%**	**0%**	**2%**	**1%**	**0%**	**0%**	**3%**	**3%**	**89%**
Lower Kalskag	0%	0%	0%	0%	0%	0%	0%	0%	59%
Upper Kalskag	0%	0%	0%	0%	0%	0%	0%	0%	38%
Aniak	0%	5%	0%	0%	0%	0%	0%	0%	48%
Chuathbaluk	0%	0%	0%	0%	0%	0%	5%	0%	42%
Middle Kuskokwim River	**0%**	**2%**	**0%**	**0%**	**0%**	**0%**	**1%**	**0%**	**47%**
Crooked Creek	20%	0%	0%	0%	0%	0%	7%	0%	73%
Red Devil	0%	0%	0%	0%	0%	0%	0%	50%	100%
Sleetmute	0%	0%	0%	0%	0%	0%	33%	0%	67%
Stony River	0%	0%	0%	0%	0%	0%	0%	0%	50%
Lime Village[a]	–	–	–	–	–	–	–	–	–
McGrath	0%	0%	0%	0%	0%	0%	15%	0%	80%
Takotna	0%	0%	0%	0%	0%	0%	0%	0%	100%
Nikolai	0%	0%	0%	0%	0%	0%	0%	0%	100%
Upper Kuskokwim River[b]	**6%**	**0%**	**0%**	**0%**	**0%**	**0%**	**10%**	**2%**	**80%**
Kuskokwim River Total[b,c]	**2%**	**0%**	**1%**	**1%**	**0%**	**0%**	**3%**	**3%**	**88%**
Quinhagak	0%	0%	5%	0%	0%	0%	0%	0%	95%
Goodnews Bay	0%	0%	0%	0%	0%	0%	0%	0%	75%
Platinum	0%	0%	0%	0%	0%	0%	0%	0%	100%
South Kuskokwim Bay	**0%**	**0%**	**4%**	**0%**	**0%**	**0%**	**0%**	**0%**	**92%**
Kuskokwim Area Total[b]	**2%**	**0%**	**1%**	**1%**	**0%**	**0%**	**3%**	**3%**	**88%**

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Table E2.–Page 4 of 4.

Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are unavailable.

a. No surveys were conducted in these communities.

b. Percentages in subtotals only include communities where data is available.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

d. Reason Unknown includes irrelevant responses, such as "Didn't get enough." Most respondents provided comments on reasons for not getting enough, but they were non-specific and could not be coded into categorical responses; these have been coded as "Unknown reason."

Table E3.–Comments provided by survey participants regarding whether or not their subsistence needs for sockeye salmon were met, surveyed communities, Kuskokwim Management Area, 2022.

Community	Total households	Valid responses	Percentage of households: Needs met	No need	Needs not met
Kongiganak[a]	90	–	–	–	–
North Kuskokwim Bay	**90**	**–**	**–**	**–**	**–**
Tuntutuliak	126	39	64%	0%	36%
Eek	98	29	48%	7%	45%
Kasigluk	109	48	42%	0%	58%
Nunapitchuk	131	53	43%	4%	53%
Atmautluak	69	21	62%	0%	38%
Napakiak	111	26	50%	0%	50%
Napaskiak	116	31	65%	0%	35%
Oscarville	21	11	36%	27%	36%
Bethel	1,795	**350**	**47%**	**9%**	**43%**
Kwethluk	182	71	35%	4%	61%
Akiachak	177	34	50%	6%	44%
Akiak	92	24	42%	0%	58%
Tuluksak	105	46	24%	4%	72%
Lower Kuskokwim River	**3,132**	**783**	**46%**	**6%**	**48%**
Lower Kalskag	96	22	18%	5%	77%
Upper Kalskag	55	16	63%	0%	38%
Aniak	162	40	18%	30%	53%
Chuathbaluk	30	19	32%	16%	53%
Middle Kuskokwim River	**343**	**97**	**28%**	**16%**	**56%**
Crooked Creek	37	24	21%	21%	58%
Red Devil	7	4	25%	25%	50%
Sleetmute	34	14	36%	14%	50%
Stony River	14	4	50%	0%	50%
Lime Villagea	5	–	–	–	–
McGrath	94	32	22%	19%	59%
Takotna	24	5	0%	80%	20%
Nikolai	31	21	5%	76%	19%
Upper Kuskokwim River[b]	**246**	**104**	**20%**	**33%**	**47%**
Kuskokwim River Total[b,c]	**3,721**	**984**	**42%**	**10%**	**49%**
Quinhagak	195	75	75%	4%	21%
Goodnews Bay	83	15	80%	0%	20%
Platinum	18	10	40%	10%	50%
South Kuskokwim Bay	**296**	**100**	**72%**	**4%**	**24%**
Kuskokwim Area Total[b]	**4,107**	**1,084**	**44%**	**9%**	**46%**

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Table E3.–Page 2 of 4.

Community	Percentage of household reasons for not meeting needs						
	Did Not Fish	Personal	Equipment	Expenses	Management	Run Dynamics	River Conditions
Kongiganak[a]	–	–	–	–	–	–	–
North Kuskokwim Bay	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	0%	14%	7%	0%	64%	7%	0%
Eek	0%	38%	0%	8%	15%	15%	0%
Kasigluk	7%	39%	11%	4%	14%	7%	0%
Nunapitchuk	0%	18%	25%	4%	18%	18%	0%
Atmautluak	25%	50%	25%	0%	13%	13%	0%
Napakiak	8%	23%	8%	0%	15%	15%	0%
Napaskiak	9%	18%	9%	0%	55%	18%	0%
Oscarville	0%	0%	50%	0%	25%	0%	0%
Bethel	14%	22%	17%	1%	13%	11%	0%
Kwethluk	0%	28%	21%	0%	30%	7%	2%
Akiachak	0%	13%	7%	0%	53%	20%	7%
Akiak	0%	29%	14%	0%	21%	0%	7%
Tuluksak	0%	36%	21%	6%	30%	15%	3%
Lower Kuskokwim River	**7%**	**25%**	**17%**	**2%**	**22%**	**11%**	**1%**
Lower Kalskag	0%	47%	29%	6%	6%	24%	0%
Upper Kalskag	0%	50%	33%	0%	17%	17%	0%
Aniak	14%	14%	24%	0%	33%	19%	0%
Chuathbaluk	0%	20%	0%	0%	30%	30%	0%
Middle Kuskokwim River	**6%**	**30%**	**22%**	**2%**	**22%**	**22%**	**0%**
Crooked Creek	0%	43%	7%	7%	14%	21%	7%
Red Devil	0%	50%	0%	0%	0%	0%	0%
Sleetmute	29%	43%	43%	0%	0%	14%	0%
Stony River	50%	50%	0%	0%	50%	0%	0%
Lime Village[a]	–	–	–	–	–	–	–
McGrath	21%	21%	5%	0%	32%	5%	0%
Takotna	0%	100%	0%	0%	0%	0%	0%
Nikolai	0%	0%	0%	0%	50%	50%	0%
Upper Kuskokwim River[b]	**14%**	**33%**	**10%**	**2%**	**22%**	**14%**	**2%**
Kuskokwim River Total[b,c]	**8%**	**27%**	**17%**	**2%**	**22%**	**13%**	**1%**
Quinhagak	13%	38%	0%	6%	0%	19%	0%
Goodnews Bay	0%	33%	33%	33%	0%	0%	0%
Platinum	20%	40%	0%	0%	0%	0%	0%
South Kuskokwim Bay	**13%**	**38%**	**4%**	**8%**	**0%**	**13%**	**0%**
Kuskokwim Area Total[b]	**8%**	**27%**	**16%**	**2%**	**21%**	**13%**	**1%**

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Table E3.–Page 3 of 4.

Community	Percentage of household reasons for not meeting needs: Weather	Conservation	Human	Animal	Environmental	COVID	Not Enough Sharing	Other	Reason Unknown[d]
Kongiganak[a]	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	21%	0%	0%	0%	0%	7%	0%	7%	64%
Eek	0%	0%	8%	0%	0%	0%	8%	8%	77%
Kasigluk	4%	0%	4%	0%	0%	0%	4%	11%	86%
Nunapitchuk	0%	0%	4%	0%	4%	0%	11%	7%	82%
Atmautluak	0%	0%	0%	0%	0%	0%	0%	0%	75%
Napakiak	8%	0%	0%	0%	0%	0%	8%	8%	100%
Napaskiak	0%	0%	0%	0%	0%	0%	0%	0%	82%
Oscarville	25%	0%	0%	0%	0%	0%	0%	25%	75%
Bethel	**1%**	**0%**	**1%**	**1%**	**0%**	**0%**	**3%**	**4%**	**90%**
Kwethluk	0%	0%	2%	2%	0%	0%	2%	0%	95%
Akiachak	0%	0%	0%	0%	0%	0%	0%	0%	93%
Akiak	0%	0%	0%	0%	0%	0%	0%	0%	93%
Tuluksak	0%	0%	6%	3%	0%	0%	0%	3%	67%
Lower Kuskokwim River	**2%**	**0%**	**2%**	**1%**	**0%**	**0%**	**3%**	**4%**	**86%**
Lower Kalskag	0%	0%	0%	0%	0%	0%	0%	0%	88%
Upper Kalskag	0%	0%	0%	0%	0%	0%	0%	0%	83%
Aniak	0%	10%	0%	0%	0%	0%	0%	0%	76%
Chuathbaluk	0%	0%	0%	0%	0%	0%	10%	0%	100%
Middle Kuskokwim River	**0%**	**4%**	**0%**	**0%**	**0%**	**0%**	**2%**	**0%**	**85%**
Crooked Creek	21%	0%	0%	0%	0%	0%	7%	0%	71%
Red Devil	0%	0%	0%	0%	0%	0%	0%	50%	100%
Sleetmute	0%	0%	0%	0%	0%	0%	14%	0%	57%
Stony River	0%	0%	0%	0%	0%	0%	0%	0%	50%
Lime Village[a]	–	–	–	–	–	–	–	–	–
McGrath	0%	0%	0%	0%	0%	0%	16%	0%	79%
Takotna	0%	0%	0%	0%	0%	0%	0%	0%	100%
Nikolai	0%	0%	0%	0%	0%	0%	0%	0%	100%
Upper Kuskokwim River[b]	**6%**	**0%**	**0%**	**0%**	**0%**	**0%**	**10%**	**2%**	**76%**
Kuskokwim River Total[b,c]	**2%**	**0%**	**2%**	**1%**	**0%**	**0%**	**4%**	**4%**	**85%**
Quinhagak	6%	0%	6%	0%	0%	0%	0%	0%	94%
Goodnews Bay	0%	0%	0%	0%	0%	0%	0%	0%	67%
Platinum	0%	0%	0%	0%	20%	0%	0%	0%	100%
South Kuskokwim Bay	**4%**	**0%**	**4%**	**0%**	**4%**	**0%**	**0%**	**0%**	**92%**
Kuskokwim Area Total[b]	**2%**	**0%**	**2%**	**1%**	**0%**	**0%**	**3%**	**3%**	**85%**

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Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are unavailable.

a. No surveys were conducted in these communities.

b. Percentages in subtotals only include communities where data is available.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

d. Reason Unknown includes irrelevant responses, such as "Didn't get enough." Most respondents provided comments on reasons for not getting enough, but they were non-specific and could not be coded into categorical responses; these have been coded as "Unknown reason."

Table E4.–Comments provided by survey participants regarding whether or not their subsistence needs for coho salmon were met, surveyed communities, Kuskokwim Management Area, 2022.

Community	Total households	Valid responses	Percentage of households: Needs met	No need	Needs not met
Kongiganak[a]	90	–	–	–	–
North Kuskokwim Bay	**90**	**–**	**–**	**–**	**–**
Tuntutuliak	126	39	28%	13%	59%
Eek	98	27	37%	15%	48%
Kasigluk	109	48	23%	2%	75%
Nunapitchuk	131	53	36%	13%	51%
Atmautluak	69	21	29%	19%	52%
Napakiak	111	26	35%	15%	50%
Napaskiak	116	31	16%	32%	52%
Oscarville	21	11	36%	36%	27%
Bethel	1,795	**350**	**40%**	**11%**	**49%**
Kwethluk	182	69	20%	14%	65%
Akiachak	177	34	41%	6%	53%
Akiak	92	24	25%	0%	75%
Tuluksak	105	46	20%	15%	65%
Lower Kuskokwim River	**3,132**	**779**	**33%**	**12%**	**55%**
Lower Kalskag	96	22	0%	36%	64%
Upper Kalskag	55	16	56%	6%	38%
Aniak	162	40	18%	23%	60%
Chuathbaluk	30	19	37%	26%	37%
Middle Kuskokwim River	**343**	**97**	**24%**	**24%**	**53%**
Crooked Creek	37	24	13%	17%	71%
Red Devil	7	4	25%	25%	50%
Sleetmute	34	14	29%	43%	29%
Stony River	14	4	50%	0%	50%
Lime Villagea	5	–	–	–	–
McGrath	94	32	19%	16%	66%
Takotna	24	5	0%	40%	60%
Nikolai	31	21	5%	86%	10%
Upper Kuskokwim River[b]	**246**	**104**	**16%**	**35%**	**49%**
Kuskokwim River Total[b,c]	**3,721**	**980**	**30%**	**16%**	**54%**
Quinhagak	195	75	40%	31%	29%
Goodnews Bay	83	11	27%	36%	36%
Platinum	18	10	40%	20%	40%
South Kuskokwim Bay	**296**	**96**	**39%**	**30%**	**31%**
Kuskokwim Area Total[b]	**4,107**	**1,076**	**31%**	**17%**	**52%**

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Table E4.–Page 2 of 4.

Community	Percentage of household reasons for not meeting needs						
	Did Not Fish	Personal	Equipment	Expenses	Management	Run Dynamics	River Conditions
Kongiganak[a]	–	–	–	–	–	–	–
North Kuskokwim Bay	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	0%	4%	4%	0%	30%	0%	0%
Eek	0%	31%	0%	0%	8%	15%	0%
Kasigluk	6%	31%	8%	3%	11%	6%	0%
Nunapitchuk	0%	15%	22%	0%	15%	15%	0%
Atmautluak	18%	36%	18%	0%	9%	9%	0%
Napakiak	8%	23%	8%	0%	15%	0%	0%
Napaskiak	6%	13%	6%	0%	25%	13%	0%
Oscarville	0%	0%	33%	0%	33%	0%	0%
Bethel	**13%**	**17%**	**13%**	**1%**	**11%**	**9%**	**0%**
Kwethluk	0%	24%	13%	0%	24%	7%	2%
Akiachak	0%	11%	6%	0%	39%	17%	0%
Akiak	0%	22%	11%	0%	17%	0%	6%
Tuluksak	0%	37%	23%	7%	27%	10%	0%
Lower Kuskokwim River	**7%**	**20%**	**13%**	**1%**	**17%**	**8%**	**0%**
Lower Kalskag	0%	50%	29%	0%	7%	21%	0%
Upper Kalskag	0%	33%	33%	0%	17%	17%	0%
Aniak	13%	8%	21%	0%	25%	17%	0%
Chuathbaluk	0%	14%	0%	0%	29%	29%	0%
Middle Kuskokwim River	**6%**	**24%**	**22%**	**0%**	**20%**	**20%**	**0%**
Crooked Creek	0%	41%	6%	6%	12%	18%	6%
Red Devil	0%	50%	0%	0%	0%	0%	0%
Sleetmute	25%	25%	50%	0%	0%	0%	0%
Stony River	50%	50%	0%	0%	50%	0%	0%
Lime Village[a]	–	–	–	–	–	–	–
McGrath	19%	19%	5%	0%	29%	5%	0%
Takotna	0%	33%	0%	0%	0%	0%	0%
Nikolai	0%	0%	0%	0%	50%	0%	0%
Upper Kuskokwim River[b]	**12%**	**29%**	**8%**	**2%**	**20%**	**8%**	**2%**
Kuskokwim River Total[b,c]	**7%**	**22%**	**13%**	**1%**	**17%**	**9%**	**1%**
Quinhagak	9%	18%	0%	5%	0%	14%	0%
Goodnews Bay	0%	25%	0%	25%	0%	0%	0%
Platinum	25%	50%	0%	0%	0%	0%	0%
South Kuskokwim Bay	**10%**	**23%**	**0%**	**7%**	**0%**	**10%**	**0%**
Kuskokwim Area Total[b]	**7%**	**22%**	**12%**	**1%**	**17%**	**10%**	**1%**

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Table E4.–Page 3 of 4.

Community	Percentage of household reasons for not meeting needs: Weather	Conservation	Human	Animal	Environmental	COVID	Not Enough Sharing	Other	Reason Unknown[d]
Kongiganak[a]	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	13%	0%	0%	0%	0%	4%	0%	0%	83%
Eek	0%	0%	0%	0%	0%	0%	8%	0%	85%
Kasigluk	3%	0%	3%	0%	0%	0%	3%	8%	89%
Nunapitchuk	0%	0%	0%	0%	4%	0%	11%	7%	89%
Atmautluak	0%	0%	0%	0%	0%	0%	0%	0%	82%
Napakiak	8%	0%	0%	0%	0%	0%	0%	8%	100%
Napaskiak	0%	0%	0%	0%	0%	0%	0%	0%	88%
Oscarville	33%	0%	0%	0%	0%	0%	0%	33%	67%
Bethel	**1%**	**0%**	**1%**	**1%**	**0%**	**0%**	**2%**	**3%**	**92%**
Kwethluk	0%	0%	2%	2%	0%	0%	2%	0%	96%
Akiachak	0%	0%	0%	0%	0%	0%	0%	0%	94%
Akiak	0%	0%	0%	0%	0%	0%	0%	0%	94%
Tuluksak	0%	0%	7%	3%	0%	0%	0%	3%	67%
Lower Kuskokwim River	**2%**	**0%**	**1%**	**1%**	**0%**	**0%**	**2%**	**3%**	**89%**
Lower Kalskag	0%	0%	0%	0%	0%	0%	0%	0%	86%
Upper Kalskag	0%	0%	0%	0%	0%	0%	0%	0%	83%
Aniak	0%	8%	0%	0%	0%	0%	0%	0%	79%
Chuathbaluk	0%	0%	0%	0%	0%	0%	14%	0%	100%
Middle Kuskokwim River	**0%**	**4%**	**0%**	**0%**	**0%**	**0%**	**2%**	**0%**	**84%**
Crooked Creek	18%	0%	0%	0%	0%	0%	6%	0%	76%
Red Devil	0%	0%	0%	0%	0%	0%	0%	50%	100%
Sleetmute	0%	0%	0%	0%	0%	0%	25%	0%	75%
Stony River	0%	0%	0%	0%	0%	0%	0%	0%	50%
Lime Village[a]	–	–	–	–	–	–	–	–	–
McGrath	0%	0%	0%	0%	0%	0%	14%	0%	81%
Takotna	0%	0%	0%	0%	0%	0%	0%	0%	100%
Nikolai	0%	0%	0%	0%	0%	0%	0%	0%	100%
Upper Kuskokwim River[b]	**6%**	**0%**	**0%**	**0%**	**0%**	**0%**	**10%**	**2%**	**80%**
Kuskokwim River Total[b,c]	**2%**	**0%**	**1%**	**1%**	**0%**	**0%**	**3%**	**3%**	**88%**
Quinhagak	0%	0%	5%	0%	0%	0%	0%	0%	91%
Goodnews Bay	0%	0%	0%	0%	0%	0%	0%	0%	75%
Platinum	0%	0%	0%	0%	0%	0%	0%	0%	100%
South Kuskokwim Bay	**0%**	**0%**	**3%**	**0%**	**0%**	**0%**	**0%**	**0%**	**90%**
Kuskokwim Area Total[b]	**2%**	**0%**	**1%**	**1%**	**0%**	**0%**	**3%**	**3%**	**88%**

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Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are unavailable.

a. No surveys were conducted in these communities.

b. Percentages in subtotals only include communities where data is available.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

d. Reason Unknown includes irrelevant responses, such as "Didn't get enough." Most respondents provided comments on reasons for not getting enough, but they were non-specific and could not be coded into categorical responses; these have been coded as "Unknown reason."

Table E5.–Comments provided by survey participants regarding whether or not their subsistence needs for pink salmon were met, surveyed communities, Kuskokwim Management Area, 2022.

Community	Total households	Valid responses	Percentage of households: Needs met	No need	Needs not met
Kongiganak[a]	90	–	–	–	–
North Kuskokwim Bay	**90**	–	**–**	**–**	**–**
Tuntutuliak	126	39	8%	74%	18%
Eek	98	25	0%	96%	4%
Kasigluk	109	48	6%	69%	25%
Nunapitchuk	131	53	28%	43%	28%
Atmautluak	69	21	5%	86%	10%
Napakiak	111	24	0%	88%	13%
Napaskiak	116	31	10%	77%	13%
Oscarville	21	11	0%	91%	9%
Bethel	1,795	**344**	**23%**	**39%**	**38%**
Kwethluk	182	68	10%	69%	21%
Akiachak	177	31	3%	87%	10%
Akiak	92	24	8%	58%	33%
Tuluksak	105	46	7%	65%	28%
Lower Kuskokwim River	**3,132**	**765**	**15%**	**57%**	**28%**
Lower Kalskag	96	21	5%	48%	48%
Upper Kalskag	55	16	0%	94%	6%
Aniak	162	40	0%	80%	20%
Chuathbaluk	30	19	21%	53%	26%
Middle Kuskokwim River	**343**	**96**	**5%**	**70%**	**25%**
Crooked Creek	37	24	4%	83%	13%
Red Devil	7	4	25%	50%	25%
Sleetmute	34	14	7%	79%	14%
Stony River	14	4	50%	25%	25%
Lime Village[a]	5	–	–	–	–
McGrath	94	32	19%	25%	56%
Takotna	24	5	0%	80%	20%
Nikolai	31	21	5%	95%	0%
Upper Kuskokwim River[b]	**246**	**104**	**12%**	**63%**	**25%**
Kuskokwim River Total[b,c]	**3,721**	**965**	**14%**	**59%**	**27%**
Quinhagak	195	75	7%	91%	3%
Goodnews Bay	83	13	15%	85%	0%
Platinum	18	10	30%	70%	0%
South Kuskokwim Bay	**296**	**98**	**10%**	**88%**	**2%**
Kuskokwim Area Total[b]	**4,107**	**1,063**	**13%**	**62%**	**25%**

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Table E5.–Page 2 of 4.

Community	Percentage of household reasons for not meeting needs						
	Did Not Fish	Personal	Equipment	Expenses	Management	Run Dynamics	River Conditions
Kongiganak[a]	–	–	–	–	–	–	–
North Kuskokwim Bay	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	0%	14%	14%	0%	14%	0%	0%
Eek	0%	100%	0%	0%	0%	0%	0%
Kasigluk	8%	50%	17%	0%	8%	0%	0%
Nunapitchuk	0%	27%	20%	0%	13%	20%	0%
Atmautluak	0%	0%	50%	0%	0%	0%	0%
Napakiak	0%	33%	33%	0%	0%	0%	0%
Napaskiak	0%	25%	0%	0%	50%	0%	0%
Oscarville	0%	0%	100%	0%	0%	0%	0%
Bethel	**15%**	**18%**	**15%**	**1%**	**10%**	**9%**	**0%**
Kwethluk	0%	29%	14%	0%	36%	7%	0%
Akiachak	0%	67%	0%	0%	33%	0%	0%
Akiak	0%	38%	13%	0%	38%	0%	13%
Tuluksak	0%	54%	38%	8%	8%	15%	0%
Lower Kuskokwim River	**10%**	**25%**	**17%**	**1%**	**14%**	**8%**	**0%**
Lower Kalskag	0%	50%	30%	0%	10%	20%	0%
Upper Kalskag	0%	0%	100%	0%	0%	0%	0%
Aniak	25%	0%	25%	0%	50%	38%	0%
Chuathbaluk	0%	40%	0%	0%	20%	20%	0%
Middle Kuskokwim River	**8%**	**29%**	**25%**	**0%**	**25%**	**25%**	**0%**
Crooked Creek	0%	33%	0%	0%	67%	33%	0%
Red Devil	0%	100%	0%	0%	0%	0%	0%
Sleetmute	50%	0%	50%	0%	0%	0%	0%
Stony River	0%	0%	0%	0%	100%	0%	0%
Lime Village[a]	–	–	–	–	–	–	–
McGrath	17%	17%	6%	0%	33%	6%	0%
Takotna	0%	100%	0%	0%	0%	0%	0%
Nikolai	0%	0%	0%	0%	0%	0%	0%
Upper Kuskokwim River[b]	**15%**	**23%**	**8%**	**0%**	**35%**	**8%**	**0%**
Kuskokwim River Total[b,c]	**10%**	**25%**	**17%**	**1%**	**17%**	**10%**	**0%**
Quinhagak	50%	0%	0%	0%	0%	0%	0%
Goodnews Bay	0%	0%	0%	0%	0%	0%	0%
Platinum	0%	0%	0%	0%	0%	0%	0%
South Kuskokwim Bay	**50%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Kuskokwim Area Total[b]	**11%**	**25%**	**17%**	**1%**	**17%**	**10%**	**0%**

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Table E5.–Page 3 of 4.

Community	Percentage of household reasons for not meeting needs: Weather	Conservation	Human	Animal	Environmental	COVID	Not Enough Sharing	Other	Reason Unknown[d]
Kongiganak[a]	–	–	–	–	–	–	–	–	–
North Kuskokwim Bay	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Tuntutuliak	0%	0%	0%	0%	0%	0%	0%	14%	86%
Eek	0%	0%	0%	0%	0%	0%	0%	0%	100%
Kasigluk	0%	0%	0%	0%	0%	0%	8%	8%	83%
Nunapitchuk	0%	0%	0%	0%	0%	0%	13%	7%	87%
Atmautluak	0%	0%	0%	0%	0%	0%	0%	0%	100%
Napakiak	0%	0%	0%	0%	0%	0%	0%	0%	100%
Napaskiak	0%	0%	0%	0%	0%	0%	0%	0%	100%
Oscarville	0%	0%	0%	0%	0%	0%	0%	0%	100%
Bethel	**1%**	**0%**	**1%**	**1%**	**0%**	**0%**	**2%**	**4%**	**92%**
Kwethluk	0%	0%	7%	7%	0%	0%	0%	0%	86%
Akiachak	0%	0%	0%	0%	0%	0%	0%	0%	100%
Akiak	0%	0%	0%	0%	0%	0%	0%	0%	88%
Tuluksak	0%	0%	0%	0%	0%	0%	0%	0%	77%
Lower Kuskokwim River	**0%**	**0%**	**1%**	**1%**	**0%**	**0%**	**3%**	**4%**	**90%**
Lower Kalskag	100%	10%	0%	50%	30%	0%	10%	0%	0%
Upper Kalskag	100%	0%	0%	0%	100%	0%	0%	0%	0%
Aniak	100%	0%	25%	0%	25%	0%	50%	0%	13%
Chuathbaluk	100%	80%	0%	40%	0%	0%	20%	0%	0%
Middle Kuskokwim River	**100%**	**21%**	**8%**	**29%**	**25%**	**0%**	**25%**	**0%**	**4%**
Crooked Creek	0%	0%	0%	0%	0%	0%	0%	0%	67%
Red Devil	0%	0%	0%	0%	0%	0%	0%	0%	100%
Sleetmute	0%	0%	0%	0%	0%	0%	50%	0%	50%
Stony River	0%	0%	0%	0%	0%	0%	0%	0%	100%
Lime Village[a]	–	–	–	–	–	–	–	–	–
McGrath	0%	0%	0%	0%	0%	0%	17%	0%	83%
Takotna	0%	0%	0%	0%	0%	0%	0%	0%	100%
Nikolai	0%	0%	0%	0%	0%	0%	0%	0%	0%
Upper Kuskokwim River[b]	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**15%**	**0%**	**81%**
Kuskokwim River Total[b,c]	**0%**	**0%**	**1%**	**1%**	**0%**	**0%**	**4%**	**3%**	**88%**
Quinhagak	0%	0%	0%	0%	0%	0%	0%	0%	100%
Goodnews Bay	0%	0%	0%	0%	0%	0%	0%	0%	0%
Platinum	0%	0%	0%	0%	0%	0%	0%	0%	0%
South Kuskokwim Bay	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**100%**
Kuskokwim Area Total[b]	**0%**	**0%**	**1%**	**1%**	**0%**	**0%**	**4%**	**3%**	**88%**

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Source ADF&G Division of Subsistence household surveys, 2022.

Note Dashes indicate that data are unavailable.

a. No surveys were conducted in these communities.

b. Percentages in subtotals only include communities where data is available.

c. Kuskokwim River Total includes the lower Kuskokwim River, middle Kuskokwim River, and upper Kuskokwim River.

d. Reason Unknown includes irrelevant responses, such as "Didn't get enough." Most respondents provided comments on reasons for not getting enough, but they were non-specific and could not be coded into categorical responses; these have been coded as "Unknown reason."