Fishery Management Report No. 16-06

Inseason Subsistence Salmon Harvest Monitoring, Lower Kuskokwim River, 2014

Annual Report for Study 14-353

USFWS Office of Subsistence Management

Fisheries Resource Monitoring Program

by

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and

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

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure 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.
etalii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
idest (that is)	i.e.
latitude or longitude	lat or long
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

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

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The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/. This publication has undergone regional peer review.

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ABSTRACT

The *Kuskokwim inseason subsistence catch monitoring* project has been a collaborative effort between Orutsararmiut Native Council (ONC) and the Alaska Department of Fish and Game (ADF&G) in the Kuskokwim River since 2001. The objective of the project is to provide local input on salmon management decision making during the fishing season. ONC conducted weekly interviews of Bethel area subsistence fishermen at their fish camps from May 27 to July 13, 2014. The survey collected data on a family's weekly fishing methods; mesh sizes used; relative run timing; relative fishing success for Chinook (*Oncorhynchus tshawytscha*), chum (*O. keta*) and sockeye (*O. nerka*) salmon; salmon harvest goals; whether salmon subsistence needs were being met; and comments on other factors that play a role in salmon harvest and processing. Data collected were used to qualitatively assess salmon run and harvest timing, gear usage, fishing activity, and fishermen's success in achieving their subsistence harvest goals. Weekly summaries of surveys were shared with fishery managers and the Kuskokwim River Salmon Management Working Group. Fishery managers reviewed and compiled survey information with data from fisheries monitoring projects to provide an early indication of salmon run timing and subsistence harvest trends. The inseason survey also provided a venue for local users to have input into the evaluation of salmon abundance and corresponding management actions. In 2014 ONC fisheries technicians interviewed an average of 28 subsistence fishing families each week at fish camps in the Bethel area, with a total of 197 surveys conducted.

Key words: Chinook, *Oncorhynchus tshawytscha*, sockeye, *O. nerka*, chum, *O. keta*, coho, *O. kisutch*, salmon, subsistence, Bethel, Kuskokwim River, Orutsararmiut Native Council, Kuskokwim River Salmon Management Working Group.

INTRODUCTION

This report describes the findings of a collaborative project conducted by Orutsararmiut Native Council (ONC) and the Alaska Department of Fish and Game (ADF&G) in the Kuskokwim River (Figure 1). Researchers collected information from fishermen about their subsistence salmon catches during a 7-week period in June and July of 2014 and presented the information at meetings of the Kuskokwim River Salmon Management Working Group (Working Group). Members of the Working Group give input to fishery managers on management decisions for the salmon fisheries in the Kuskokwim River drainage (Peeks and Shelden 2015). Study activities were coordinated through the *Kuskokwim inseason subsistence catch monitoring program* at ONC. Participants were families using fish camps in the Bethel area between the mouth of the Gweek River and the village of Napaskiak (Figure 2).

People residing in the Kuskokwim River drainage rely on salmon as the mainstay of their diet. Fish account for up to 85% of the wild resources harvested for subsistence, in pounds of usable weight, in Kuskokwim River drainage communities, with salmon specifically accounting for up to 65% of total wild resources consumed (Fall et al. 2014). The annual harvest of salmon for home use, or subsistence, is as much as 650 pounds per capita in some of these communities (Coffing 1991).

There are 3 types of salmon fisheries in the Kuskokwim River drainage: subsistence, commercial, and a much smaller sport fishery. Although some non-resident sport fishermen do visit the Kuskokwim River each year, the majority of salmon resource users reside in the drainage. The focus of this project is the subsistence fishery.

This subsistence harvest monitoring program was initiated in 2001 in response to local public and fishery management staff concerns about below average salmon returns to the Kuskokwim River between 1997 and 2001 (Whitmore et al. 2008; Estensen et al. 2009; Brazil et al. 2013). Runs rebounded to near record abundance between 2004 and 2008, followed by a sharp decline in Chinook salmon *Oncorhynchus tshawytscha* abundance beginning in 2010. The harvest

monitoring program has remained an important assessment tool and mechanism for outreach and communications with fishermen particularly during poor runs.

Since 2004 the project has been limited to the Bethel area subsistence fishery, focusing on the peak Chinook salmon migration. This reflects the priority of assessing the harvest effort and timing of Chinook salmon over other salmon species. The project is managed and conducted by staff from ONC (the Bethel Indian Reorganization Act tribal council) in collaboration with the ADF&G Division of Commercial Fisheries office in Bethel.

In 2014, the Kuskokwim River salmon fisheries were managed according to the *Kuskokwim River Salmon Management Plan* (hereafter referred to as Management Plan; 5 AAC 07.365) adopted by the Alaska Board of Fisheries in 2013. This plan guides the management of salmon fisheries that result in the sustained yield of salmon stocks large enough to meet escapement goals, provide amounts reasonably necessary for subsistence uses, and allow for commercial and sport fisheries. Management of the Kuskokwim River is based on the best available data including the Bethel test fishery (BTF) index, subsistence harvest reports, commercial catch statistics, escapement estimates, and age and sex composition.

Both the Alaska legislature and U.S. Congress have passed laws to protect customary and traditional uses of fish and wildlife in Alaska. Therefore, inseason fisheries management in the Kuskokwim Management Area must ensure that "reasonable opportunity" to meet subsistence needs will be provided each year prior to providing opportunity for commercial and sport fishing interests.

Kuskokwim River commercial fisheries concentrate effort on coho salmon *O. kisutch* with some catches of Chinook, chum *O. keta*, and sockeye *O. nerka* salmon late in the chum season. Due to Chinook salmon conservation concerns and resulting subsistence fishing restrictions to conserve Chinook salmon in 2010–2014, processors agreed not to buy Chinook salmon. Those caught incidentally by commercial fishermen were retained for the fisherman's personal use. In 2014, the commercial fishery was postponed nearly 3 weeks to ensure ongoing Chinook salmon conservation and began well after the end of the Chinook salmon run and the majority of the chum and sockeye salmon runs. A total of 8 commercial fishery openings occurred on the Kuskokwim River in 2014 from July 14 through August 26 (none occurring during the survey period). Subsistence fishing is closed by emergency order from 6 hours before to 3 hours after each commercial salmon fishing opening.

2014 SUBSISTENCE RESTRICTIONS

The 2014 Chinook salmon forecast indicated there would not be enough fish to meet escapement goals and provide for average subsistence harvest. The conservation concern surrounding Chinook salmon prompted both preseason and inseason subsistence restrictions that affected fishermen and therefore survey results.

In 2014, preseason management actions included a closure on subsistence Chinook salmon fishing with rod and reel gear, and a restriction on gillnet use to a mesh size of 4.0 inches or less and net length no greater than 60 feet in lower river tributaries. On April 17, the Federal Subsistence Board adopted a special action to close the Kuskokwim River Chinook salmon fishery to non-federally qualified users within the boundaries of the Yukon Delta National Wildlife refuge. This created a situation in which the United States Fish and Wildlife Service (USFWS) managed the Kuskokwim River drainage within the Yukon Delta National Wildlife

Refuge from the mouth of the Kuskokwim River to a line just upriver of the village of Aniak, with state management of marine waters outside the river mouth and the balance of the Kuskokwim River drainage from the village of Aniak to the headwaters. Restrictions were implemented beginning on May 20 from the mouth of the Kuskokwim River to the village of Tuluksak, and May 27 from Tuluksak to the boundary above Aniak. In each conservation section, gillnets were restricted to 4.0 inch or less mesh size to harvest nonsalmon fish species and rod and reel fishing for Chinook salmon was closed.

The State of Alaska implemented similar restrictions in waters above Aniak beginning on June 1. In addition, the State of Alaska also closed an area below the mouth of the Kuskokwim River to further conserve Chinook salmon entering the river. Dip nets were allowed as legal subsistence fishing gear in the Kuskokwim River beginning on June 15 to allow selective harvest of salmon species other than Chinook salmon. All Chinook salmon caught in a dip net were required to be returned immediately to the water unharmed.

OBJECTIVES

The overall goals of this project were to contribute information for the management of Chinook, chum, and sockeye salmon fisheries in the Kuskokwim River drainage and to increase ONC's capacity to participate in fisheries research and management. The objectives for this project were as follows:

1. describe salmon run timing as observed through subsistence fishing activity in the Bethel area;
2. describe subsistence users' inseason assessment of whether they were meeting their subsistence salmon needs;
3. describe subsistence fishing activity and gear usage through weekly inseason interviews with Bethel area subsistence salmon fishermen in May, June, and July; and
4. provide local input into the management process for the salmon subsistence fishery through the presentation of weekly summaries of interviews with Bethel Area subsistence salmon fishermen at Working Group meetings inseason.

METHODS

The primary method of data collection was a weekly census survey conducted in each occupied fish camp in an area from the village of Napaskiak to the mouth of the Gweek River, approximately 24 river miles (Figure 2). This study area represented the primary fishing area for Bethel residents and included the overlapping fishing areas for the nearby villages of Oscarville and Napaskiak.

A survey instrument, or questionnaire, was used to collect information during survey interviews (Appendix A1). The survey instrument was developed collaboratively with staff from ADF&G, USFWS, and ONC, and has undergone only minor changes since 2001. All information was compiled by ONC and presented in a summarized format to state and federal fishery managers and Working Group participants, and via local radio news stations to the general public. Interview questions included family name, community of residence, date the family began fishing this year, fish camp location, and fishing area. Participation in the survey was voluntary

and the results were kept confidential. Results were reported for the entire project area and individuals were not identified in the findings.

Fishermen were specifically asked, "Compared with this time in a normal year, how were your catch rates for salmon this week?" Answers were categorized as "Very good," "Normal," or "Poor," and the summarized answers were viewed as an index of relative salmon abundance. In order to provide a general characterization of salmon run timing, fishermen were asked the question: "Does the salmon run appear to be running early, late, or normal?" Fishermen were also asked whether they were fishing with setnet, gillnet, or hook and line; and in the case of gillnet, they were asked whether they were using mesh sizes greater or less than 6.0 inches. Responses to all questions were recorded by week. Additional interviewee comments on the health, condition and behavior of the fish, weather patterns and other factors influencing fishing effort and success, were also included in a weekly written report (Appendix B).

Preferably participants were interviewed at seasonal fish camps in the areas of Gweek River, Church Slough, Steamboat Slough, Straight Slough, Old Bethel Airport, Oscarville Slough, Napaskiak Slough, the mainstem Kuskokwim River, and adjacent to Bethel (Figure 2). When the program began, subsistence fishing families were contacted at their camps, informed about the goals and objectives of the program, and asked if they were interested in participating. Subsequently, for each week of the survey period, technicians attempted to contact each family on the participant list. The contact list changed over time as new families were contacted and decided to participate in the program or people on the list moved away, discontinued fishing at their fish camp, or declined to participate. Many families have been participating in the survey each year for the duration of the program. People who wished to participate in the program were included if their salmon processing sites were within the study area, and they self-identified as long-term subsistence fishermen.

In 2014, many fish camps were empty because of fishing restrictions. Therefore, surveyors sought out known subsistence users by phone as an alternative means of survey. Subsistence fishermen were also interviewed opportunistically at the Bethel boat ramp when they returned from fishing. Some Bethel fishermen who had long been a part of the survey program were contacted by phone at their homes if not encountered at their fish camp or the boat ramp. The number of interviews reported each week was variable and included everyone who was interviewed whether at their fish camp, at the boat harbor, or in town. Most fishermen who were interviewed represented a larger extended family group participating in salmon harvesting, processing, and preserving. Others who processed the fish contributed information on fish health, drying conditions, or other important environmental details.

In addition to the traditional questions evident on the survey instrument, ONC technicians began asking about the use of dip nets during the third survey week.

In 2014, field season preparations began on May 24 and subsistence catch monitoring interviews began on May 27. Interviews were conducted by 3 technicians Thursday through Sunday of every week from May 24 through July 13. Weekly written reports summarizing the responses of the subsistence fishermen were completed by ONC and sent to ADF&G staff the Monday following the interview week.

RESULTS

On average, 28 families were interviewed weekly regarding their subsistence fishing activities, and a total of 197 interviews were conducted in 2014. In all, 7 weekly interview summaries were compiled for Working Group packets and presented by ONC staff at Working Group meetings during June and July 2013 (Appendices B1–B7).

Weekly summaries of the catch rates are presented as the way in which respondents categorized their fishing success (Table 1). The chum and sockeye salmon runs typically begin to pass Bethel after the Chinook salmon run is well underway, and families will normally decline to comment on these later species until later in the season. However, in 2014, families were restricted from taking Chinook salmon, and with initial catches of chum and sockeye considered more important, families did provide comments.

For each species, assessment of the run was fairly consistent from week to week. Except during the first week, Chinook salmon catches were generally considered "Poor" throughout the survey. Chum salmon were considered "Poor" to "Normal." Sockeye salmon catches were generally considered "Good" (Table 1).

WEEKLY CHARACTERIZATION OF SALMON RUN TIMING

Averaged across the survey weeks, the majority of respondents reported that the Chinook, chum, and sockeye salmon run timings were "Normal" (Table 2).

WEEKLY FISHING ACTIVITY AND GEAR USE

In the first week of the surveys, of 17 families contacted at fish camps, 10 families were fishing. 8 families reported using a setnet, 2 families reported rod and reel. Mesh size was restricted during this period and all families fishing with gillnets reported using mesh size of 6.0 inch or less. At the time, users were restricted to using 4.0 inch mesh size or less to conserve salmon.

In the first 3 weeks of the survey, families reported using primarily smaller mesh set gillnets with decreasing numbers of families using rod and reel. In the fourth week of the survey, the use of drift gillnets became apparent. In the third week of the survey, surveyors began asking if families were taking advantage of the opportunity to fish with dip nets for chum and sockeye salmon. Some dip net use was noted in this week, though none reported using this gear in subsequent weeks. It appeared that few families tried out dip net gear, which was adopted as legal subsistence gear in 2014 during times of Chinook salmon conservation. Proportions of families fishing with both set and drift gillnet gear increased through the 4 later weeks of the survey (Table 3).

REPORTS TO THE KUSKOKWIM SALMON MANAGEMENT WORKING GROUP

The ONC subsistence fisheries biologist and technicians composed and presented 7 summary reports of the survey results during the project operational period (Appendices B1–B7). These reports were presented via email and teleconference to state and federal fisheries managers and other Working Group participants, including both members and other interested parties. Oral reports were delivered during inseason meetings of the Working Group. Oral reports provided an opportunity to present the data publically, allow for questions and answers, and encourage additional discussion and feedback from subsistence fishermen.

DISCUSSION

This project relies on voluntary participation by Bethel-area subsistence fishermen, and most respondents have participated since 2001. The majority of participants are lifelong residents of the Kuskokwim Area, representing some of the most experienced and knowledgeable fishermen. Most of these families are of Alaska Native descent and harvest and process salmon at seasonal fish camps that have been maintained across generations. Interviewees typically have between 10 and 50 years of adult experience fishing in the region. Both ONC technicians who participated in this project have many years of local subsistence fishing experience. Their family relations and community connections on the Kuskokwim River foster trust and familiarity that is essential to the success of the program.

Information used to manage the Kuskokwim River fisheries early in the season consisted of BTF indices of salmon abundance (e.g., Bue and Brazil 2012) and subsistence harvest reports like those provided through this project. Later in the season, data from fisheries monitoring projects augmented this information. The inseason catch monitoring interviews provided an early indication of salmon run timing, harvest effort and relative success of catch rates in the subsistence fishery, and an indication of whether families' subsistence salmon harvest goals were being met for the season.

During the first survey week of the 2014 survey, subsistence fishermen were restricted to using 4.0-inch mesh set gillnets, rod and reel, or dip nets, in order to harvest species other than Chinook salmon. A large number of set gillnets were observed within the survey area, but relatively few fishing families agreed to be surveyed. Some surveys were conducted at the Bethel boat harbor. In subsequent weeks, survey rates increased. During weeks 5–7, opportunity was allowed for set or drift gillnets with 6.0 inch or less mesh size. Effort increased at this time and a number of families reported setting harvest goals for the season. Over the next 2 weeks most families appeared to have caught as much chum, sockeye, and incidental Chinook salmon as they could, and though harvest goals had largely not been met, fishermen were suspending subsistence fishing activity in anticipation of the coming coho salmon run. This project concluded before the bulk of the coho salmon run and associated subsistence fishing was underway (Appendices B1–B7).

Assessment of run timing was fairly consistent. Most families indicated that runs of Chinook, chum, and sockeye salmon had "Normal" run timing character (Table 2).

Assessment of catch performance was also consistent (Table 1). The vast majority of families considered the Chinook salmon catch to be "Poor" in 2014. Assessment of chum and sockeye salmon catches were mostly considered "Very Good."

Regarding discussions of gear usage, specifically mesh size, project leaders discussed the possibility of changing the questions on the survey instrument. With fishermen restricted to using 4.0-inch mesh set gillnets in early June to target nonsalmon fish species such as whitefish, the questions about mesh size appeared inadequate to track use of that gear type. Ultimately, no change was made, in hopes of preserving relationships with fishermen. There was a significant amount of anger and distrust in the community and ONC felt that asking too probing questions about harvest of salmon in 4.0-inch mesh gillnets might be a poor choice. Throughout the survey, fishermen always reported fishing with mesh size of 6.0 inches or less. It was assumed that as long as mesh size was restricted to 4.0 inches or less, that fishermen were in compliance.

ACKNOWLEDGEMENTS

We wish to thank the many subsistence fishermen and families who generously volunteered time from their busy fishing schedule to provide the detailed local information that is critical to making inseason management decisions for the Kuskokwim River fisheries. We extend great appreciation and regard for the Working Group members, many of whom have volunteered years of dedicated service to facilitating this local cooperative management process.

In addition to the normal project objectives, the ONC survey crew provided a public service by helping the distribute salmon caught in the ADF&G BTF project to community members. A list of elders and families in crisis was maintained, and salmon were provided on a rotating basis. A total of 162 Chinook salmon, 46 chum salmon, 18 sockeye salmon, and 9 sheefish were distributed among 209 Bethel households. ONC also helped 2 households from outside Bethel (1 in Tuntatuliak and the other in Akiak) by provided 1 Chinook salmon to each from the BTF. ONC cooperated with the USFWS to share 31 additional BTF caught Chinook salmon with the villages of Tuluksak, Napaskiak, Tuntatuliak, and Akiachak.

We wish to thank ONC fishery technician, Iyana Dull, for his fourth year on this project and role as the project crew leader, and especially his contribution sharing his work experiences on weir and Bethel test fish projects with subsistence fishermen interested in this information used in fishery management. ONC would also like to thank inseason fisheries technician Alissa Joseph for her successful fifth year on the project. The ONC fishery technicians' knowledge of families and fish camps in the Bethel area and excellent interviewing skills have greatly facilitated the involvement of subsistence families and the fisheries management process. We would also like to thank Daniel Bergstrom (ADF&G), Greg Roczicka (ONC), and Pippa Kenner (Office of Subsistence Management), who reviewed this document.

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TABLES AND FIGURES

Table 1.–Number of Lower Kuskokwim River area subsistence fishermen characterizing their weekly salmon catch rates as: "Very Good," "Normal," and "Poor" in 2014.

	Number of families			Number of fishing respondents								
				Chinook			Chum			Sockeye		
Week ending	Interviewed	Fishing	Not fishing	Very good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 01	17	10	7	0	6	0	0	6	0	0	6	0
Jun 08	22	22	0	2	1	12	3	9	10	12	6	4
Jun 15	24	11	13	2	0	4	0	5	1	3	2	1
Jun 22	29	22	7	2	1	12	3	9	10	12	6	4
Jun 28	42	37	5	0	3	18	23	6	3	20	6	6
Jul 06	30	5	25	0	1	3	1	2	1	1	3	0
Jul 13	33	2	31	0	0	2	1	0	1	1	0	1
Total	197	109	88									
Average	28	16	13									

Note: Represents responses (from those fishing) to the question "Compared with this time in a 'Normal' year how were catch rates for salmon this week?"

Table 2.–Number of Lower Kuskokwim River area subsistence fishermen characterizing the salmon run timing (by species) as "Early," "Normal," or "Late" in 2014.

	Number of families			Number of fishing respondents								
				Chinook			Chum			Sockeye		
Week ending	Interviewed	Fishing	Not fishing	Early	Normal	Late	Early	Normal	Late	Early	Normal	Late
Jun 01	17	10	7	0	6	0	0	5	1	0	5	1
Jun 08	22	22	0	3	2	2	1	5	1	1	5	1
Jun 15	24	11	13	1	3	1	1	4	1	2	3	1
Jun 22	29	22	7	4	5	3	5	12	4	6	12	2
Jun 28	42	37	5	4	11	5	6	20	6	6	20	6
Jul 06	30	5	25	0	0	4	1	2	1	0	2	2
Jul 13	33	2	31	0	1	1	0	1	1	0	0	2
Total	197	109	88									
Average	28	16	13									

Note: Represents responses (from those fishing) to the question "Compared with this time in a 'Normal' year how was salmon run timing this week?"

Table 3.–Number of Lower Kuskokwim River area subsistence fishermen, by week, that indicated which type of salmon fishing gear they were using in 2014.

	Number of families		Gear type fishing with:					Mesh size		
Week ending	Interviewed	Fishing	Only driftnet	Only setnet	Both set and drift	Rod and reel	Dip nets	Only >6.0 inch mesh	Only ≤6 inch mesh	Both >6.0 inch and ≤6.0 inch
Jun 01	17	10	0	8	0	2	ND	0	8	0
Jun 08	22	22	0	8	0	1	ND	0	8	0
Jun 15	24	11	0	9	0	1	2	0	9	0
Jun 22	29	22	0	19	3	0	0	0	22	0
Jun 28	42	37	12	12	9	0	0	0	33	0
Jul 06	30	5	4	1	0	0	0	0	5	0
Jul 13	33	2	1	0	1	0	0	0	2	0
Total	197	109								
Average	28	16								

Note: Represents responses (from those fishing) to questions regarding gear type usage.

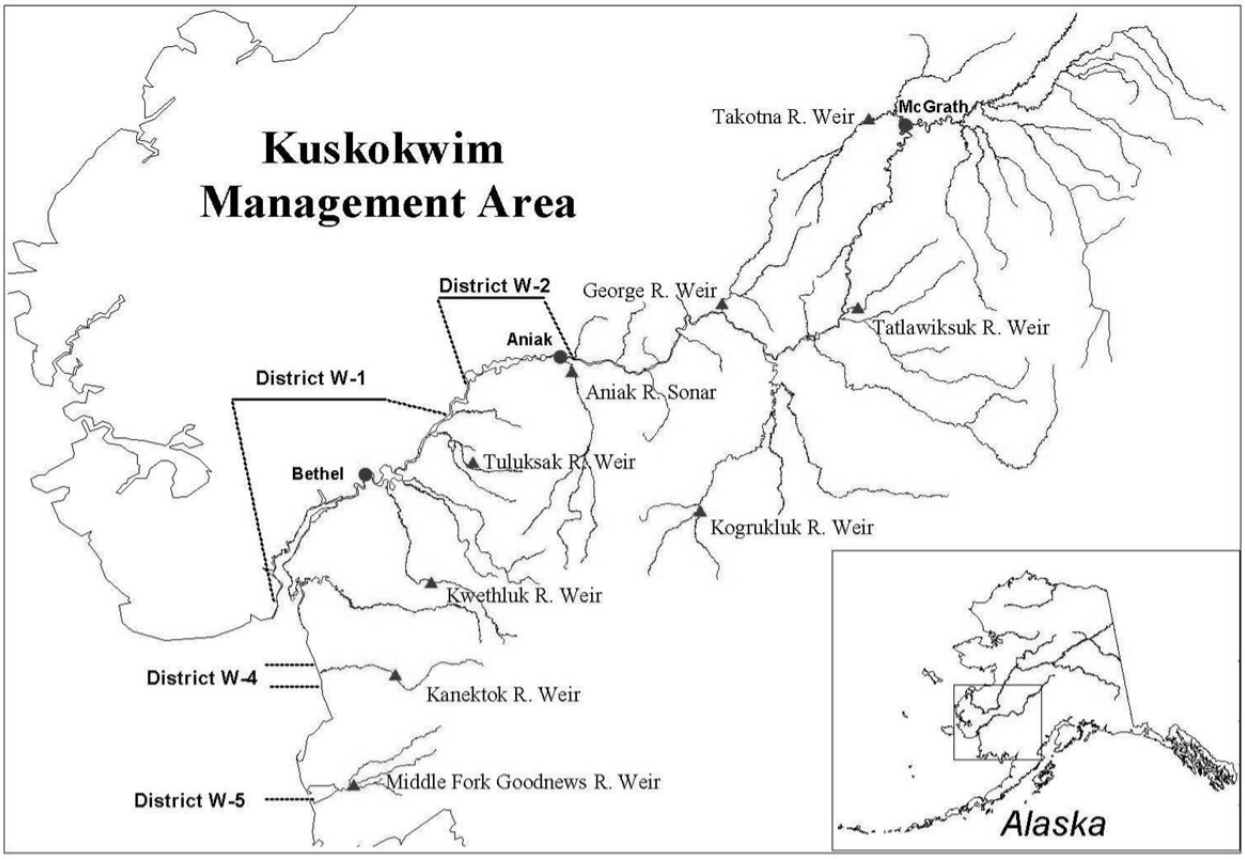

Figure 1.–Kuskokwim Management Area.

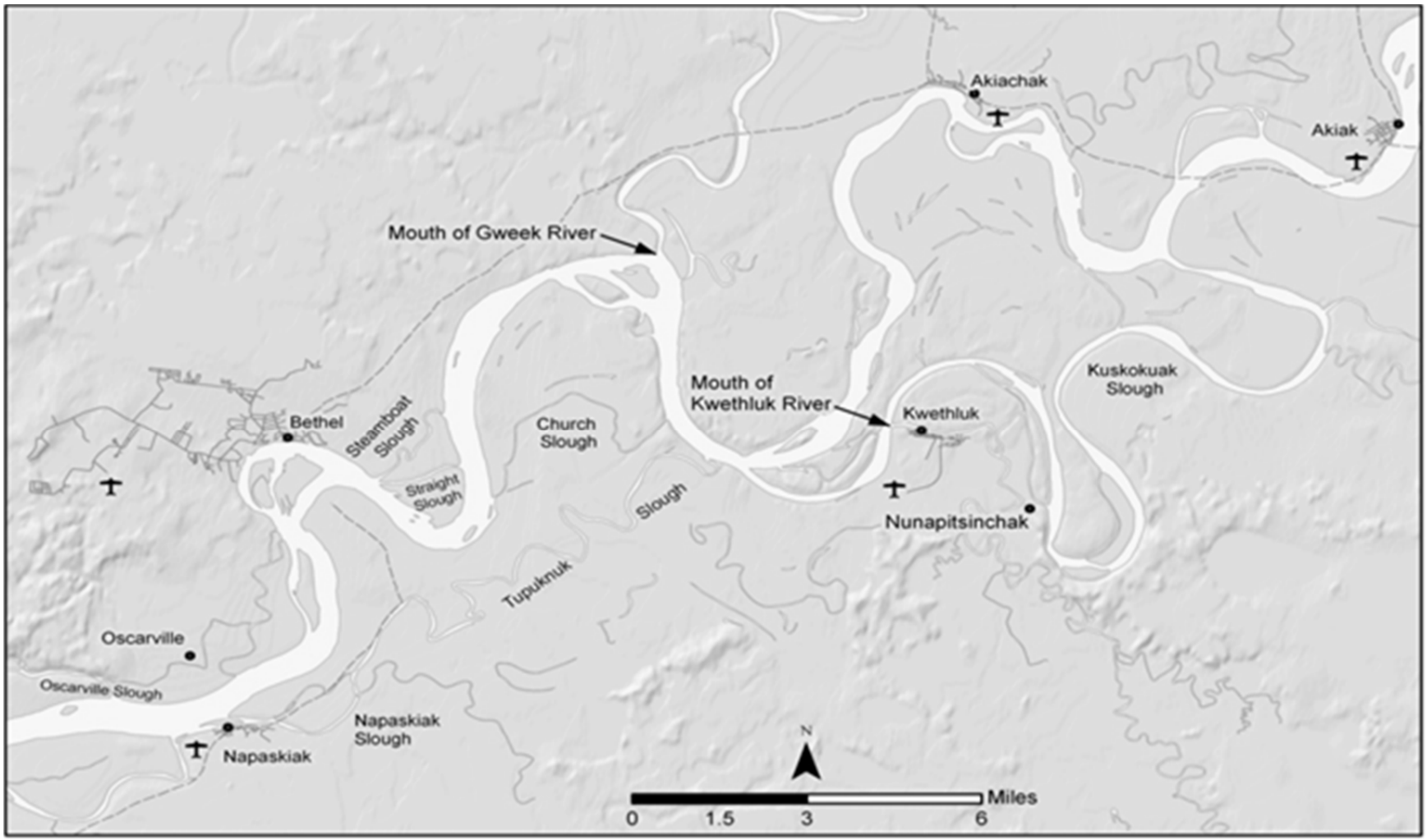

Figure 2.–Inseason subsistence harvest monitoring survey area, 2014.

Note: Survey fish camps are located along the main channel of the Kuskokwim River and numerous sloughs located between the mouth of the Gweek River and the village of Napaskiak.

APPENDIX A. EXAMPLE OF SURVEY INSTRUMENT

Appendix A1.–Example of Lower Kuskokwim River subsistence salmon fishing survey form.

Family Name: Lastname Firstname Community

Fishcamp Location

Date family started salmon fishing this year (month, day)

Primary Subsistence Salmon Fishing Areas

What are your family's salmon harvest goals this year ? (number of salmon) King _____, (Chinook) Chum _____, Sockeye _____, (" Red ")

		Salmon Fishing Gear Used This Week						Compared with this time in a "NORMAL" year, how were catch rates for salmon this week?									Does the salmon run appear to be running early, late, or normal?								
		Net Type		Mesh ?				King Salmon			Chum Salmon			Sockeye Salmon			King Salmon			Chum Salmon			Sockeye Salmon		
Staff initials	Week Ending	Drift Net	Set Net	6" or Less	More than 6"	Rod Reel	Fish Wheel	Very Good	OK Normal	Poor	Very Good	OK Normal	Poor	Very Good	OK Normal	Poor	Early	Normal	Late	Early	Normal	Late	Early	Normal	Late
	28-May																								
	4-Jun																								
	11-Jun																								
	18-Jun																								
	25-Jun																								
	2-Jul																								
	9-Jul																								
	16-Jul																								
	31-Jul																								

Comments

Staff initials	Week Ending	Few fish ? Lot of fish ? Weather affecting fishing? Water levels? Size of Fish ? Fish look healthy ? Fishing harder this year ? Drying condidtions? Fishing in more places/areas than usual
	28-May	
	4-Jun	
	11-Jun	
	18-Jun	
	25-Jun	
	2-Jul	
	9-Jul	
	16-Jul	
	31-Jul	

Were your family's salmon harvest goals achieved ? Kings _____, Chum _____, Sockeye_____.

When did your family stop subsistence fishing for: King Salmon_____, (month, day) Chum Salmon_____, (month, day) Sockeye Salmon_____, (month, day)

APPENDIX B. LOWER KUSKOKWIM RIVER INSEASON SUBSISTENCE SALMON CATCH MONITORING WEEKLY REPORTS, 2014

Appendix B1.–Lower Kuskokwim River inseason subsistence catch monitoring weekly report, Orutsararmiut Native Council, June 1, 2014.

Fishing reports from May 27-June 1, 2014

Families Surveyed	Families Fishing	Driftnets	Setnets	Both Nets	Larger than 6" mesh	6" mesh and smaller	Both Sizes	Rod &Reel
17	**10**	0	8	0	0	8	0	2
		0%	80%	0%	0%	80%	0%	20%

Percentages are based on the number of families fishing each week.

Compared with this time in a normal year, how are catch rates for salmon this week?

CHINOOK			CHUM			SOCKEYE		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	6	0	0	6	0	0	6	0
0%	60%	0%	0%	60%	0%	0%	60%	0%

Percentages are based on the number of families fishing each week.

Does the salmon run timing appear to be early, late, or normal?

CHINOOK			CHUM			SOCKEYE		
Early	Normal	Late	Early	Normal	Late	Early	Normal	Late
0	6	0	0	5	1	0	5	1
0%	60%	0%	0%	50%	10%	0%	50%	10%

Percentages are based on the number of families fishing each week.

Harvest Goal Summary:

Four families were unsure about their salmon harvest goals this year. One family commented that in a normal year, they would harvest between 40-100 Chinook salmon to feed 3 families and numerous relatives.

Chinook:

Three families were unsure whether they would target Chinook salmon and 3 families said that they would not harvest Chinook salmon this year.

Chum:

Seven families said that they planned to harvest chum salmon this year. Harvest goals ranged from 5-200, or more.

Sockeye: Seven families said that they planned to harvest sockeye salmon this year. Harvest goals ranged from 30-200.

-continued-

Other species of fish:

Five families said they planned to harvest between 15-50 coho salmon.

Three families reported actively targeting whitefish. Goals ranged between 15-200.

There are a few families that commented on harvesting and catching a range of other fish species such as Sheefish, whitefish, pike, lush, and trout

Comments:

Out of 8 families fishing, 4 families reported using 4-inch mesh set gillnet; 2 families reported using 3.5-inch mesh set gillnet; and 2 families did not comment. Two families reported using only rod-n-reel, and 2 families reported using 2 different mesh size nets.

Four families declined to comment on run timing and catch rates for salmon.

Chinook:

Six families commented that the Chinook catch rate and run timing were normal.

Chum:

Six families commented that the chum salmon catch rate was normal for this time of year and 5 families commented that the run timing was normal. One family said they were running late.

Sockeye:

Six families commented that the sockeye salmon catch rate was normal and 1 family commented that the run timing was late.

Surveyor comments:

This week the ONC Subsistence Fishery Survey Crew counted a total of 22 setnets between Bethel to the mouth of Church Slough, and a total of 10 setnets from Bethel downriver to Napakiak.

To date the ONC Subsistence Crew distributed a total of 2 Chinook ASL kits. Due to the Chinook restrictions and closures, many fish camps were empty during this week's survey. The ONC Subsistence Survey Crew also observed a lot of fish camps with whitefish and Sheefish on the drying racks.

This year the ONC Subsistence Survey Crew has been collecting Bethel Test Fish catches to be distributed to elders in Bethel. We have distributed a total of 10 Chinook, 2 Sockeye, 1 Chum, 5 Sheefish, and 1 Cisco. The ONC crew has brought salmon to the following locations: Senior Center, Lulu Herron Apartments, and 3 elders. We are keeping a distribution list of elders. If you know of any elders that need fish, please contact the ONC Subsistence Survey Crew to be added to this list.

Appendix B2.–Lower Kuskokwim River inseason subsistence catch monitoring weekly report, Orutsararmiut Native Council, June 8, 2014.

Families Surveyed	Families Fishing	Driftnets	Setnets	Both Nets	Larger than 6" mesh	6" mesh and smaller	Both Sizes	Rod &Reel
22	**9**	0	8	0	0	8	0	1
		0%	89%	0%	0%	89%	0%	11%

Percentages are based on the number of families fishing each week.

Compared with this time in a normal year, how are catch rates for salmon this week?

CHINOOK			CHUM			SOCKEYE		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
1	4	2	0	5	2	0	5	2
11%	44%	22%	0%	56%	22%	0%	56%	22%

Percentages are based on the number of families fishing each week.

Does the salmon run timing appear to be early, late, or normal?

CHINOOK			CHUM			SOCKEYE		
Early	Normal	Late	Early	Normal	Late	Early	Normal	Late
3	2	2	1	5	1	1	5	1
33%	22%	22%	11%	56%	11%	11%	56%	11%

Percentages are based on the number of families fishing each week.

Harvest Goal Summary:

Seven families reported Chum salmon harvest goals to range from 50 to over 100 this season. Seven families are expecting to harvest a range of 30-200 Sockeye salmon.

A few families set a goal of 400 salmon (all species) to be harvested this year to meet their needs. Two families declined to report harvest goals this year.

Eight families are harvesting more whitefish this week than previous years at this time. One family reported a whitefish harvest goal of 50 or more this season. Five families are expecting to harvest 50-100 Coho salmon this season.

Chinook:

One family reported the catch rate for Chinook salmon to be very good. Four families reported the run timing to be normal for early June. Two families reported the Chinook salmon run timing as late. Three families reported the run timing as normal.

Chum:

Five families reported the chum salmon catch rate to be normal, and two families reported it to be poor. One family reported the run timing as early, five families reported it as normal, and one family reported it to be late.

-continued-

Sockeye:

Five families reported the catch rate as normal and two families reported it to be poor. One family reported the run timing as early, five families reported it as normal, and one family reported it to be late.

Comments:

Families reported waiting until restrictions are lifted to harvest salmon.

Four families suggested a Chinook salmon moratorium (similar to the moose moratorium). One family suggested a seven year Chinook salmon moratorium. Two families suggested closing international and high-seas fishing; and stronger enforcement of by-catch restrictions. One family suggested an international Chinook salmon conservation act or agreement.

Surveyor comments:

For the week ending of June 9th, ONC surveyed 22 families from the mouth of Church Slough downriver to Napaskiak Slough.

Some families were unable to comment on the catch rate or the run timing this week.

So far there are two ASL subsistence samplers for this season, but we have yet to receive any samples.

No families reported using gillnets with mesh size bigger than 4" or directly targeting Chinook salmon. From the mouth of the Gweek River down to Napaskiak Slough, we observed a total of 129 set nets.

ONC, USFWS, and ADFG distributed 150 fish this week to Tuluksak, Napaskiak, Tuntutuliak, Akiachak, Kwethluk and Bethel.

Appendix B3.–Lower Kuskokwim River inseason subsistence catch monitoring weekly report, Orutsararmiut Native Council, June 15, 2014.

Fishing reports from June 10-15, 2014

Families Surveyed	Families Fishing	Driftnets	Setnets	Both Nets	Larger than 6" mesh	6" mesh and smaller	Both Sizes	Rod &Reel	Dipnet
24	**11**	0	9	0	0	9	0	1	2
		0%	82%	0%	0%	82%	0%	11%	18%

Percentages are based on the number of families fishing each week.

Compared with this time in a normal year, how are catch rates for salmon this week?

CHINOOK			CHUM			SOCKEYE		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
2	0	4	0	5	1	3	2	1
18%	0%	36%	0%	45%	9%	27%	18%	9%

Percentages are based on the number of families fishing each week.

Does the salmon run timing appear to be early, late, or normal?

CHINOOK			CHUM			SOCKEYE		
Early	Normal	Late	Early	Normal	Late	Early	Normal	Late
1	3	1	1	4	1	2	3	1
9%	27%	9%	9%	36%	9%	18%	27%	9%

Percentages are based on the number of families fishing each week.

Harvest Goal Summary:

Three families set harvest goals of mixed salmon ranging from 20-100 with no direct target on a specific salmon species. Two families had not set harvest goals, because they have not started fishing yet.

Two families planned to harvest 15-200 whitefish this season. One family reported a plan to harvest 50 or more whitefish.

One family reported to have met their Chum and Sockeye harvest goals this week and are done fishing. Three families reported being half-way done to meeting their harvest goals and plan on being done in the next couple of days.

Chinook:

Five families commented on their Chinook harvest goals this week. Three families were undecided about whether they would directly target Chinook, but planned to keep incidental harvest of that species. Two families expressed strong belief in conservation of Chinook and planned to delay fishing until July.

Families have reported that the incidental catches of Chinook are healthy and showed no signs of disease or parasites. One family reported catching spawning Chinook.

-continued-

Chum:

Seven families reported Chum harvest goals this week. Three families reported a harvest goal of 20, two families reported 30, one family reported 100, and one family reported over 200 needed to reach their subsistence harvest goals this year.

Two families reported catching more chum than reds at the beginning of the week.

Sockeye:

Seven families reported Sockeye harvest goals this week. One family reported a harvest goal of 20, two families reported 30, two families reported 40, one family reported 150, and one family reported over 200 needed to reach their subsistence harvest goals this year.

This week families were catching big, healthy, and bright sockeye. One family reported catching a red that had pus under the skin. There was no trace of an open wound. Four families reported catching more reds at the end of the week.

Coho:

Two families planned to target 20-30 Coho salmon instead of targeting Chinook salmon.

Comments:

Two families that had not started fishing this week were getting salmon from Bethel Test Fish.

Two families commented on sharing nets with other families to reach harvest goals. One family reported a push of salmon on the 13th of this week. Respondents indicated that they had caught 20 salmon in a 24 hour period, checking the net twice in that time. Another family reported catching 5 salmon daily in 24 hour sets in Steamboat Slough.

One family reported dip netting for 3-5 hours above Bethel and didn't catch anything.

One family reported while cutting fish that the brains of the salmon were getting smaller.

Surveyor comments:

For the week ending in June 15th, ONC surveyed 24 families from the mouth of Church Slough to Napaskiak Slough. The number of families that are supported per fish camps ranged from one to ten families.

Surveyors observed 132 setnets from Church Slough to Napaskiak this week. On the first dip net opening, a total of three boats were counted from Bethel on down river.

Surveyors have distributed 3 ASL kits to date this year.

Appendix B3.–Lower Kuskokwim River inseason subsistence catch monitoring weekly report, Orutsararmiut Native Council, June 22, 2014.

Fishing reports from June 16-22, 2014

Families Surveyed	Families Fishing	Driftnets	Setnets	Both Nets	Larger than 6" mesh	6" mesh and smaller	Both Sizes	Rod &Reel	Dipnet
2	**22**	0	19	3	0	22	0	0	0
		0%	86%	14%	0%	100%	0%	0%	0%

Percentages are based on the number of families fishing each week.

Compared with this time in a normal year, how are catch rates for salmon this week?

CHINOOK			CHUM			SOCKEYE		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
2	1	12	3	9	10	12	6	4
9%	5%	55%	14%	41%	45%	55%	27%	18%

Percentages are based on the number of families fishing each week.

Does the salmon run timing appear to be early, late, or normal?

CHINOOK			CHUM			SOCKEYE		
Early	Normal	Late	Early	Normal	Late	Early	Normal	Late
4	5	3	5	12	4	6	12	2
18%	23%	14%	23%	55%	18%	27%	55%	9%

Percentages are based on the number of families fishing each week.

Harvest Goal Summary: This week 12 families discussed harvest goals for this season.

Three families planned to harvest 15-200 whitefish this season.

Two families reported having met their Chum and Sockeye harvest goals for the season and are done fishing. Three families reported being half-way to meeting their harvest goals and plan on finishing within the next couple of days.

Chinook:

Four families said they are not targeting Chinook salmon this year. Two families said they are keeping incidental catches of Chinook. Two families did not comment on harvest goals for Chinook salmon. One family commented that they hadn't caught Chinook in their setnet two days in a row. Two families commented on releasing live Chinook salmon from their setnets this week. Two families reported that they have not met their goals but are done fishing until coho's arrive. Some families reported catching Chinook in spawning colors.

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Chum:

This week 11 families reported Chum harvest goals ranging from 10-200 salmon. One family reported catching Chum in spawning colors.

Sockeye:

This week 11 families reported sockeye salmon harvest goals of 5-200. One family reported catching more reds than normal, this week. Two families reported some of the reds they caught had parasites.

Coho:

Six families reported harvest goals ranging from 15-30 salmon.

Comments:

Three families reported having gone fishing below the Johnson River to take advantage of the subsistence opening to 6-inch mesh driftnets. Five families have not started fishing this year and two families have stopped fishing.

Two families reported Chinook salmon catch rates dropping off. One family commented that a group of fisherman went fishing for them. One family reported catching small Chinook without reproductive organs. One family reported witnessing salmon floating down the river. One family reported catching Arctic Char, and one reported to releasing a live Arctic Char from their net. One family reported catching Dolly Varden that was bigger than Sockeye and Chum. One family reported that the Kuskokwim water is too swift for dipnetting.

Surveyor comments:

For the week ending of June 22th, ONC surveyed 29 families from the mouth of Church Slough to Napaskiak slough. The number of families that are supported per fish camp ranged from 1 to 20. Surveyors observed 148 setnets from Church Slough to Napaskiak this week. One boat was observed dip netting.

Seven families did not comment on catch rate

Ten families did not comment on run timing.

Surveyors have distributed 5 ASL kits to date this year with no ASL samples returned so far.

Appendix B4.–Lower Kuskokwim River inseason subsistence catch monitoring weekly report, Orutsararmiut Native Council, June 28, 2014.

Fishing reports from June 22-28, 2014

Families Surveyed	Families Fishing	Driftnets	Setnets	Both Nets	Larger than 6" mesh	6" mesh and smaller	Both Sizes	Rod &Reel	Dipnet
42	**37**	12	12	9	0	33	0	0	0
		32%	32%	24%	0%	89%	0%	0%	0%

Percentages are based on the number of families fishing each week.

Compared with this time in a normal year, how are catch rates for salmon this week?

CHINOOK			CHUM			SOCKEYE		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	3	18	23	6	3	20	6	6
0%	8%	49%	62%	16%	8%	54%	16%	16%

Percentages are based on the number of families fishing each week.

Does the salmon run timing appear to be early, late, or normal?

CHINOOK			CHUM			SOCKEYE		
Early	Normal	Late	Early	Normal	Late	Early	Normal	Late
4	11	5	6	20	6	6	20	6
11%	32%	14%	16%	54%	16%	16%	54%	16%

Percentages are based on the number of families fishing each week.

Harvest Goal Summary:

This week 19 families set harvest goals. One family reported a trout and whitefish harvest goal of 20 each, as well as one full drying rack of mixed salmon species. Three families reported a harvest goal of 40-300 mixed species of salmon. One family was still unsure about setting harvest goals because this was the first year they will be harvesting salmon other than Chinook.

Thirteen families reported to being done fishing this week and all reported not to having met their Chinook salmon subsistence needs. Eleven families reported to having met their sockeye and chum salmon seasonal needs and two families reported not having met their needs.

Five families were not willing to comment on the catch rate and run timing. Two families had not started fishing this year and one family had been given salmon. Another family this week reported to stop fishing abruptly, because they were moving.

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Chinook:

Eleven families did not want to comment on the catch rate and twelve families did not want to comment on run timing, these are not included into the table.

Six families said they would not be targeting Chinook salmon this year. Twelve families reported traditional harvest goals for Chinook salmon, but were not directly targeting that species.

Many families that are fishing stated that catch rates for Chinook salmon have slowed down and a majority of the run has passed.

Chum:

Sixteen families reported chum salmon harvest goals ranging from 2-200+ salmon. Many families reported catching spawning or spawned chum salmons. One family reported catching one chum salmon that had already began deteriorating flesh. Families have been reporting chum salmon having a white-milky looking puss in the meat.

Sockeye:

Eleven families reported to having harvest goals ranging from 5-200 salmon. One family reported catching more sockeye salmon, this week, than normal. Two families reported some of the sockeye salmon they caught had parasites.

Coho:

Four families reported harvest goals ranging from 20-300 salmon.

Comments:

One family had reported seeing dead chum salmon floating down the river.

No families reported using a dip net.

Surveyor comments:

Five families did not comment this week. One family didn't comment on run timing or catch rate.

For the week ending on June 29th, ONC surveyed 42 families from the mouth of Gweek River to Napaskiak Slough.

Surveyors observed 64 set nets from the mouth of the Gweek River to Napaskiak this week.

Surveyors have distributed 5 ASL kits and one family turned in their subsistence samples.

Appendix B5.–Lower Kuskokwim River inseason subsistence catch monitoring weekly report, Orutsararmiut Native Council, July 6, 2014.

Fishing reports from July 1-6, 2014

Families Surveyed	Families Fishing	Driftnets	Setnets	Both Nets	Larger than 6" mesh	6" mesh and smaller	Both Sizes	Rod &Reel	Dipnet
30	**5**	4	1	0	0	5	0	0	0
		80%	20%	%	%	100%	%	%	%

Percentages are based on the number of families fishing each week.

Compared with this time in a normal year, how are catch rates for salmon this week?

CHINOOK			CHUM			SOCKEYE		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	1	3	1	2	1	1	3	0
0%	20%	60%	20%	40%	20%	20%	60%	0%

Percentages are based on the number of families fishing each week.

Does the salmon run timing appear to be early, late, or normal?

CHINOOK			CHUM			SOCKEYE		
Early	Normal	Late	Early	Normal	Late	Early	Normal	Late
0	0	4	1	2	1	0	2	2
0%	0%	80%	20%	40%	20%	%	40%	40%

Percentages are based on the number of families fishing each week.

Harvest Goal Summary:

24 families reported being done fishing. No families met their King harvest goals this year. 13 families met harvest goals for chum and 5 did not. 12 families met harvest goals for sockeye and 6 did not. 6 families did not comment on meeting harvest goals but are done fishing. 1 family reported a harvest goal of 53 mixed salmon species.

Chinook:

All families that were surveyed this week reported not to have met their harvest goals for Chinook. Some families are reporting catching a few Chinook when driftnet fishing and small jacks are still being caught in set nets

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Chum:

1 family reported that they only targeted chum. 1 family reported a chum having different color eggs. 1 family reported seeing dead chum floating down river.

Sockeye:

1 family reported a harvest goal of 100 sockeye. The catch rate for sockeye is slowing down and in set nets big reds getting caught by their lower jaw. More spawning reds are being caught that are headed toward lower tributaries.

Comments:

Fisherman reported drifting with 5 ¾" and 6" mesh. All set nets being used are 4" mesh. One family has not started fishing and one family is fishing for those who aren't.

Surveyor comments:

For the week ending of July 7th surveyors observed 10 set nets from Napaskiak to Gweek River and 4 drift net fisherman.

Appendix B6.–Lower Kuskokwim River inseason subsistence catch monitoring weekly report, Orutsararmiut Native Council, July 13, 2014.

Fishing reports from July 6-13, 2014

Families Surveyed	Families Fishing	Driftnets	Setnets	Both Nets	Larger than 6" mesh	6" mesh	4" mesh	Rod &Reel	Dipnet
33	**2**	1	0	1	0	1	1	0	0
		50%	0%	50%	0%	50%	50%	0%	0%

Percentages are based on the number of families fishing each week.

Compared with this time in a normal year, how are catch rates for salmon this week?

CHINOOK			CHUM			SOCKEYE		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	0	2	1	0	1	1	0	1
0%	0%	100%	50%	0%	50%	50%	0%	50%

Percentages are based on the number of families fishing each week.

Does the salmon run timing appear to be early, late, or normal?

CHINOOK			CHUM			SOCKEYE		
Early	Normal	Late	Early	Normal	Late	Early	Normal	Late
0	1	1	0	1	1	0	0	2
0%	50%	50%	0%	50%	50%	0%	0%	100%

Percentages are based on the number of families fishing each week.

Harvest Goal Summary:

Thirty families reported being done fishing. No families met their king salmon harvest goals this year. Twenty-one families met their harvest goals for chum salmon and 9 did not. Twenty families met their harvest goals for sockeye salmon and 10 did not. Seven families did not comment on meeting their harvest goals but were done fishing.

Chinook:

Families that were fishing didn't report catching any king salmon.

Chum:

It was reported that people were catching more chum salmon downriver.

Sockeye: It was reported that people going up river for fishing were catching more sockeye salmon.

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Comments:

People were done fishing because the bugs and rainy season had arrived.

Surveyor comments:

Surveyors observed three drifters from the Gweek River to Napaskiak.

ONC coordinated with the Bethel Test Fishery to deliver caught fish to Kuskokwim River communities. ONC Fisheries began delivering of fish to Bethel community members on May 30, 2014 and made their last delivery on June 15, 2014. A total of 211 households received fish. Fish caught during the late night/early morning tide went to the USFWS to distribute to the surrounding villages. The second drift of BTF was distributed by ONC's Natural Resources Department. Approximately, 195 king salmon, 46 chum salmon, 20 sockeye salmon, 11 Sheefish, 2 Cisco, and 11 Humpback whitefish were distributed. A total of 285 fish were distributed by the ONC Natural Resources staff.