Fishery Management Report No. 05-27

Lower Kuskokwim River Inseason Subsistence Salmon Catch Monitoring, 2004

Final Report for Study 04-353
USFWS Office of Subsistence Management
Fisheries Information Services Division

by

Michael Martz

and

Craig Whitmore

April 2005

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.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

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

FISHERY MANAGEMENT REPORT NO. 05-27

LOWER KUSKOKWIM RIVER INSEASON SUBSISTENCE SALMON CATCH MONITORING, 2004

by

Michael Martz and Craig Whitmore,
Division of Commercial Fisheries, Bethel

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1599

April 2005

The Division of Sport Fish Fishery Management Reports series was established in 1989 for the publication of an overview of Division of Sport Fish management activities and goals in a specific geographic area. Since 2004, the Division of Commercial Fisheries has also used the Fishery Management Report series. 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.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm. This publication has undergone regional peer review.

Michael Martz and Craig Whitmore
Alaska Department of Fish and Game, Division of Commercial Fisheries,
PO Box 1467 Bethel, AK 99559-1467, USA

This document should be cited as:
Martz, M., and C. Whitmore. 2005. Lower Kuskokwim River inseason subsistence salmon catch monitoring, 2004. Alaska Department of Fish and Game, Fishery Management Report No. 05-27, Anchorage.

The Alaska Department of Fish and Game administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility, or if you desire further information please write to ADF&G, P.O. Box 25526, Juneau, AK 99802-5526; U.S. Fish and Wildlife Service, 4040 N. Fairfax Drive, Suite 300 Webb, Arlington, VA 22203 or O.E.O., U.S. Department of the Interior, Washington DC 20240.

For information on alternative formats for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-6077, (TDD) 907-465-3646, or (FAX) 907-465-6078.

TABLE OF CONTENTS

Page

LIST OF TABLES ii

LIST OF FIGURES ii

LIST OF APPENDICES ii

ABSTRACT 1

INTRODUCTION 1

Outlook and Management Strategies 3
Fishery Management 4
Objectives 5

METHODS 5

Interviews 5

RESULTS 7

DISCUSSION 8

CONCLUSIONS 9

RECOMMENDATIONS 11

Objectives 11

ACKNOWLEDGEMENTS 11

REFERENCES CITED 12

TABLES AND FIGURES 13

APPENDIX A. EXAMPLE OF SURVEY INSTURMENT 29

APPENDIX B. KUSKOKWIM RIVER INSEASON SUBSISTENCE SALMON CATCH MONITORING WEEKLY REPORTS 31

APPENDIX C. KUSKOKWIM RIVER INSEASON SUBSISTENCE SALMON SUMMARY OF FISHING REPORTS 45

LIST OF TABLES

Table **Page**

1. Historical utilization of Chinook salmon in the Kuskokwim River. 14
2. Historical utilization of chum salmon in the Kuskokwim River. 15
3. Historical utilization of sockeye salmon in the Kuskokwim River. 16
4. Historical utilization of coho salmon in the Kuskokwim River. 17
5. District 1, Kuskokwim River, commercial fishing and subsistence closure hours, 2004. 18
6. Kuskokwim River inseason subsistence summary report, summary of salmon fishing, 2004. 19
7. Kuskokwim River Chinook and chum salmon subsistence summary, quality of fishing report, 2004. 20
8. Kuskokwim River sockeye and coho salmon subsistence summary, quality of fishing report 2004. 21
9. Kuskokwim River inseason subsistence survey fishing gear use summary, 2004. 22

LIST OF FIGURES

Figure **Page**

1. Composition of subsistence harvest by species as reported by postseason harvest surveys, Kuskokwim Area, 10-year average, 1994–2003. 23
2. Subsistence Chinook salmon harvest as reported by postseason harvest surveys, Kuskokwim River, 1994–2003. 24
3. Subsistence chum salmon harvest as reported by postseason harvest surveys, Kuskokwim River, 1994–2003. 24
4. Subsistence sockeye salmon harvest as reported by postseason harvest surveys, Kuskokwim River, 1994–2003. 25
5. Subsistence coho salmon harvest as reported by postseason harvest surveys, Kuskokwim River, 1994–2003. 25
6. Kuskokwim Management Area. 26
7. District 1, Subdistricts 1-A and 1-B. 27
8. Subsistence survey area, 2004. 28

LIST OF APPENDICES

Appendix **Page**

A. Example of Kuskokwim River subsistence salmon fishing survey form. 30
B1. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, June 7, 2004. 32
B2. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, June 14, 2004. 33
B3. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, June 21, 2004. 34
B4. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, June 28, 2004. 35
B5. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, July 06, 2004. 36
B6. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, July 12, 2004. 37
B7. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, July 19, 2004. 38
B8. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, July 26, 2004. 39
B9. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, August 2, 2004. 40
B10. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, August 9, 2004. 41

LIST OF APPENDICES (Continued)

Appendix **Page**

B11. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, August 16, 2004. 42
B12. Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, August 23, 2004. 43
C1. Kuskokwim River subsistence summary report, summary of salmon fishing, 2003. 46
C2. Kuskokwim River Chinook and chum salmon subsistence summary, quality of fishing report, 2003. 47
C3. Kuskokwim River sockeye and coho salmon subsistence summary, quality of fishing report, 2003. 48
C4. Kuskokwim River subsistence salmon summary, quality of fishing report, 2002. 49
C5. Kuskokwim River Chinook and chum salmon subsistence summary, quality of fishing report, 2002. 50
C6. Kuskokwim River sockeye and coho salmon subsistence summary, quality of fishing report, 2002. 51
C7. Kuskokwim River subsistence summary report, summary of salmon fishing, 2001. 52
C8. Kuskokwim River Chinook and chum salmon subsistence summary, quality of fishing report, 2001. 53
C 9. Kuskokwim River sockeye and coho salmon subsistence summary, quality of fishing report, 2001. 54

ABSTRACT

Through a collaborative effort with the Alaska Department of Fish and Game (ADF&G) the Orutsararmiut Native Council (ONC) conducted inseason subsistence salmon surveys addressing qualitative assessment of run timing and abundance at selected fish camps and in communities of fishers in the lower Kuskokwim River during the summer of 2004. Information collected from these surveys was provided to fishery managers on a weekly basis. The Kuskokwim River fishery is cooperatively managed by ADF&G, United States Fish and Wildlife Service (USFWS), and the Kuskokwim River Salmon Management Working Group (Working Group).

Fishery managers are dependent on information from inseason run assessment projects to evaluate salmon run strength in order to achieve management objectives. One of the primary inseason indicators of salmon run strength is information collected from the test fishing project conducted just upstream of Bethel. Information collected from this project provides a general evaluation of the relative strength of the run by species. This index of salmon run strength is affected by the variability of run timing between years and anomalies created by environmental factors. The inseason subsistence catch monitoring project provided additional information to evaluate salmon run strength by obtaining the relative success of some subsistence fishers in achieving their harvest goals. Additionally, this project provided a venue for local user input into the evaluation of salmon abundance and corresponding management strategies. Historically, fishery managers collected information ad hoc from a few subsistence fishers. However, the ONC inseason subsistence monitoring program initiated in 2001 increased the quality and consistency of information obtained from subsistence fishers. This project increased the number and frequency of fishing family interviews, thereby increasing the credibility of the salmon catch information. Comparisons of inseason subsistence catch information now can be made among weeks within a year and among years. Inseason subsistence catch information has been used in combination with other information to determine appropriate inseason management decisions.

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

INTRODUCTION

The Kuskokwim River drains an area of approximately 50,000 square miles, 11% of the total area of Alaska (Brown 1983). Each year adult salmon return to the river and support subsistence, commercial, and sport fisheries. The Kuskokwim Area subsistence salmon fishery is one of the largest and most important in the state (ADF&G 2003). From June through August the daily activities of many Kuskokwim Area households revolve around harvesting, processing, and preserving salmon for subsistence use. The use of family fish camps has been, and remains an important part of Kuskokwim area subsistence activities. Alaska Department of Fish and Game (ADF&G), Division of Subsistence (SD) studies in the region indicate that fish contribute as much as 85% of the total pounds of fish and wildlife harvested in a community and salmon as much as 53% of the total annual harvest (Coffing 1991). The harvest of salmon for subsistence use is as much as 650 lbs per capita in some Kuskokwim River communities. The average total utilization of Kuskokwim River salmon from 1994–2003 was 0.7 million fish (Tables 1 through 4). The recent 10-year (1994–2003) average subsistence harvest includes 77,468 Chinook salmon *Oncorhynchus tshawytscha*, 58,693 chum salmon *O. keta*, 37,177 sockeye salmon *O. nerka* and 31,085 coho salmon *O. kisutch* (Figure 1) (ADF&G *in press*). By comparison, the same 10-year average annual commercial harvest consists of 8,775 Chinook, 124,608 chum, 28,019 sockeye, and 332,023 coho salmon.

More than 1,500 households in the Kuskokwim Area annually harvest salmon for subsistence use and many households not directly involved in catching salmon assist family and friends with cutting, drying, smoking, and associated preservation activities (salting, canning, and freezing).

The majority (75%) of Kuskokwim Area households are situated within the Kuskokwim River drainage. Bethel is the largest community in the region, consisting of approximately 1,700 households. In 2003, the postseason survey conducted by ADF&G SD estimated that residents of Bethel accounted for 28% of the Kuskokwim Area subsistence harvests and 30% of all subsistence caught Chinook salmon. ADF&G SD also estimated that 58,500 Chinook salmon were harvested by residents of lower Kuskokwim River villages, or 81% of the total Kuskokwim River Chinook salmon subsistence harvest (Figures 1 and 2) (ADF&G *in press*).

Alaska Statute 16.05.258. *Subsistence use and allocation of fish and game* establishes a subsistence use priority for reasonable harvest opportunity consistent with sustained yield management. Consistent with State statute, the Alaska Board of Fisheries (BOF) has made a finding of levels of Kuskokwim salmon that are customary and traditionally taken or used for subsistence (5AAC 01.286). For the Kuskokwim River drainage the BOF found the following amounts of fish are reasonably necessary for subsistence uses: 1) 64,500–83,000 Chinook salmon, 2) 39,500–75,500 chum salmon, 3) 27,500–39,500 sockeye salmon, and 4) 24,500–35,000 coho salmon. ADF&G SD conducts annual postseason household fishing surveys in most of the Kuskokwim Area communities in order to estimate subsistence salmon harvest levels (ADF&G 2003). Postseason Kuskokwim River household surveys indicate salmon harvested in 2003 fell within amounts necessary for subsistence ranges for all species during 2003 (Figures 2 through 5).

The Alaska National Interest Lands Conservation Act of 1980 mandates that rural subsistence users have a priority over other users to take wildlife on Federal public lands where recognized customary and traditional use patterns exist (16 U.S.C.A. 3114). On October 1, 1999, the Secretaries of Interior and Agriculture published regulations to expand Federal Management of subsistence fisheries to Alaskan rivers and lakes and limited marine waters within and adjacent to Federal public lands. Federal subsistence fishing regulations are adopted by the Federal Subsistence Board (FSB).

Based on annual postseason subsistence survey estimates, Kuskokwim Area subsistence salmon fisheries consistently rank as one of the largest in the State of Alaska (ADF&G 2003). State and Federal lawmakers have recognized the use and dependence of residents of the area on this resource and have established subsistence use as the highest priority among resource users. In order to maintain the resource, State regulations and policies have been established to provide for sustained yield management. Kuskokwim Area commercial fishing regulations since 1985 have limited gillnet mesh size to 6 inch maximum and, in 1987, the directed Chinook salmon commercial fishery was discontinued (Ward et al. 2003). In response to the guidelines established in the Sustainable Salmon Fisheries Policy (5 AAC 39.222), the BOF classified the Kuskokwim River Chinook and chum salmon stocks as yield concerns in September 2000. This determination was based on the inability, despite the use of specific management measures, to maintain expected yields, or harvestable surpluses, above the stock's escapement needs since 1998 and anticipated low adult salmon returns in 2001 (Burkey et al. 2000). In response to the yield concern classification, the Kuskokwim River Salmon Rebuilding Management Plan (5 AAC 07.365) was adopted by the BOF in January 2001 and amended in January 2004 (Bergstrom and Whitmore 2004). The FSB supported this action through Special Action during the 2001 season and more recently through an Interim Memorandum of Agreement. This management plan provides guidelines for the rebuilding and management of the Kuskokwim River salmon fishery that will result in the sustained yield of salmon stocks large enough to meet

escapement goals, provide fishers with a reasonable opportunity to harvest subsistence salmon, and to provide for fisheries other than subsistence.

The Kuskokwim River Salmon Management Working Group (Working Group) was formed in 1988 by the BOF in response to requests from stakeholders in the Kuskokwim River drainage who wanted to take a more active role in the management of salmon fishery resources (Mundy 1995). Since then, the Working Group has become increasingly active in the preseason, inseason, and postseason management of the Kuskokwim River drainage subsistence, commercial, and sport salmon fisheries. In 2001, the Working Group modified its by-laws in order to more effectively address the needs of the Federal Subsistence Management Program by including members of the Coordinating Fisheries Committee of the Yukon-Kuskokwim Delta and Western Interior Regional Advisory Councils (RAC) (Whitmore and Martz 2005). The Working Group now serves as a public forum for Federal and State fisheries managers to meet with local users of the salmon resource to review run assessment information and reach a consensus on how to proceed with management of Kuskokwim River salmon fisheries. The Working Group typically meets first in March or April each calendar year; has intensive and frequent meetings during June, July, and August; and has a wrap-up session in September or October. Working Group meetings provide a forum for area fishers, user representatives, community representatives, RAC representatives, Fish and Game Advisory Committee members, and State and Federal managers to come together and discuss issues relevant to sustained yield fishery management and provides for a subsistence use priority. Working Group meetings provide a venue for the inseason subsistence catch monitoring project to present its findings to Kuskokwim fishery managers and Working Group members.

OUTLOOK AND MANAGEMENT STRATEGIES

Preseason information provided to fishers regarding the fishery outlook and management strategies affected how they planned and scheduled their fishing activities. In 2004, ADF&G expected the Chinook, chum, and sockeye salmon runs to be similar to the 2003 salmon runs or slightly stronger. In 2003, Chinook and chum salmon run sizes were large enough to provide for both adequate escapements and subsistence harvests throughout most of the drainage. Salmon runs during the 2004 season were expected to be large enough to achieve escapement goals and amounts necessary for subsistence with a harvestable surplus available for fisheries other than subsistence. It was anticipated that a coho salmon directed commercial fishery would occur from late July through August.

For the past two decades, a system has been in place to monitor salmon run timing and run strength by comparison of current year information to historic information. This system includes, but is not limited to, the evaluation of Bethel test fishery (BTF) project catch rates, commercial harvest catch rates, weir passage, sonar passage, and evaluation of the numbers of salmon on spawning grounds through aerial surveys at clear water tributary streams. Evaluation of inseason subsistence harvest information, collected ad hoc, has always been a component of this process.

In 2001, the inseason subsistence fishery monitoring program was initiated to obtain more consistent, qualitative, subsistence harvest information in the Kuskokwim Area (Whitmore et al. 2004). The monitoring program is a result of a cooperative effort between State, Federal and local governing agencies funded through the United States Fish and Wildlife Service (USFWS), Office of Subsistence Management (OSM). The program has strengthened the role subsistence

catch monitoring information plays in achieving management priorities such as meeting escapement goals, or providing fishers with an opportunity to tell fishery managers how their subsistence salmon harvests are progressing. In the Bethel area, the Orutsararmiut Native Council (ONC), a local tribal organization, conducts the cooperative project and employs technicians who survey subsistence fishers inseason and summarize and report their findings to ADF&G, USFWS and the Working Group on a weekly basis.

FISHERY MANAGEMENT

The Kuskokwim River salmon fishery is managed according to the Kuskokwim River Salmon Rebuilding Management Plan (Rebuilding Plan). The purpose of the Rebuilding Plan is to provide guidelines for rebuilding and management of the Kuskokwim River fishery that will result in the sustained yield of salmon stocks large enough to meet the escapement goals, amounts necessary for subsistence, and for fisheries other than subsistence (5 AAC 07.365). The Rebuilding Plan provides direction for establishing a subsistence fishing schedule allowing salmon net and fish wheel fisheries to be open for 4 consecutive days per week in June and July as announced by emergency order. The schedule is implemented in a step wise progression up the river consistent with salmon run timing and may be altered based on run strength to achieve escapement goals. Once escapement goals are assured for Chinook and chum salmon, subsistence fishing can be allowed 7 days per week. The goal of the windowed subsistence fishing schedule is to spread the subsistence harvest of Chinook and chum salmon out across the run and allow fish to pass through the lower river to spread subsistence fishing opportunity to fishers in upper Kuskokwim River areas.

In 2004, the Kuskokwim River subsistence fishing schedule was in effect from June 1 through June 20. During this time subsistence fishing with gillnets with a mesh size > 4 inches and fish wheels was prohibited 3 days per week from Sunday through Tuesday. The first day closed to subsistence salmon fishing was June 6 in all waters downstream of Bogus Creek. On June 13, the schedule was expanded to all waters downstream of Chuathbaluk, and on June 20, the schedule was eliminated (based on a recommendation by the Working Group) prior to becoming effective for the entire Kuskokwim River drainage. Some non-salmon tributaries in the lower and middle Kuskokwim River drainage were not affected by this schedule nor were waters outside of the Kuskokwim River drainage. Therefore, there were 6 days when subsistence fishing was restricted downstream of Bogus Creek and 3 days when subsistence fishing was restricted between Bogus Creek and Chuathbaluk. There was no subsistence fishing restrictions upstream of Chuathbaluk. Kuskokwim River fishers criticized the subsistence fishing schedule, particularly after the 2004 BOF decision to liberalize the Area M commercial fishery in the Alaska Peninsula. At a May 18 Working Group meeting, discussion centered on this particular BOF decision, and methods of protesting the decision were discussed, including a potential boycott of the subsistence fishing schedule. Compliance with the schedule was good and no fishing violation citations were issued by enforcement entities.

The Rebuilding Plan provides further direction to provide for a commercial salmon fishery if it is determined that salmon abundance is in excess of that required to achieve escapement goals and that adequate opportunity is provided for fishers to achieve amounts necessary for subsistence use. By the third week of June 2004, it was determined by State and Federal managers and the Working Group that a harvestable surplus of salmon was available to implement a commercial fishery in District 1 (Figure 6). Initially, 4 commercial fishing periods (2 in Subdistrict 1-A and 2 in Subdistrict 1-B) occurred between June 30 and July 7 (Figure 7). The second component of

the commercial fishery was directed toward the harvest of coho salmon from July 28 to September 8. Between June 30 and September 8, 22 commercial fishing periods occurred.

Subsistence fishing closures associated with commercial fishing periods affect the spatial distribution of subsistence fishers during commercial periods and their harvest success through increased competition for the same resource. The hours closed to subsistence fishing around commercial openings in the Kuskokwim River during the 2004 season was 6 hours before, during, and 3 hours after commercial fishing periods within the subdistrict opened to commercial fishing and in a portion of the adjacent subdistrict. In 2004, commercial fishing activities in the Kuskokwim River resulted in 382 hours of subsistence closures in both subdistricts combined (Table 5).

This report summarizes results from inseason subsistence harvest surveys conducted by ONC in the summer of 2004 with subsistence fishers in the Bethel area of the lower Kuskokwim River (FIS 04-353). This report represents a final report for project FIS 04-353 funded by USFWS OSM. Project 04-353 is a continuation of project FIS 01-132, operated from 2001 through 2003 (Whitmore et al. 2004).

OBJECTIVES

Objectives for project FIS 04-353, Bethel area inseason subsistence salmon catch monitoring data collection include:

1. Determine the adequacy and quality of fish harvested by conducting weekly interviews of subsistence salmon fishers in the Bethel area (approximately from Napaskiak to Kwethluk River).
2. Provide oral and written summaries of interview findings to ADF&G, USFWS, local Federal RAC members, State Fish and Game Advisory Committees, and the Working Group weekly, on the Monday following the interview week, so the information would be available to assist in inseason fishery management decisions.
3. Estimate the age, sex, and size composition of the Chinook salmon harvested in the lower Kuskokwim River subsistence fisheries.

Results from objective 3 are not included in this report. Objective 3 will be addressed similar to past years by Molyneaux et al. (2004a; b).

METHODS

In consultation with ADF&G staff, ONC hired fishery technicians to: 1) conduct weekly interviews with subsistence fishers along the mainstem Kuskokwim River and 2) collect biological data from Chinook salmon taken in the subsistence fishery to characterize the age, sex, and length (ASL) composition of the subsistence harvest by gear type. ONC technicians conducted inseason subsistence surveys and collected Chinook salmon biological data in the Lower Kuskokwim River area between Oscarville and the mouth of the Kwethluk River (Figure 8).

INTERVIEWS

The Lower Kuskokwim River subsistence fishery catch monitoring project relies on voluntary participation of local subsistence fishers. Participants are allowed to remain anonymous and

most have participated since 2001 when the project began. Most are life-long residents of the Kuskokwim Area and represent some of the most experienced and knowledgeable fishers in the Bethel area. Nearly all participants are interviewed at seasonal fishing locations (fish camps) that have been maintained across generations. Most participants are of Alaska Native descent with a long tradition of practicing subsistence as a way of life. Fish camp locations are still an important part of subsistence salmon harvests in the Bethel area and were generally established by the ancestors of today's catch monitoring participants. Generally, the subsistence fisher responsible for the majority of the subsistence salmon harvest will be interviewed at each fish camp. This fisher generally represents a larger group of people participating in the harvest, processing and preserving of subsistence caught salmon. The amount of experience in the fishery by those interviewed ranges from 10 to 50 years each. Fishers interviewed can represent a cumulative contribution of up to 1000 years of fishing experience and observation (40 or more interviews with 10 to 50 years of participant fishing experience) in any given weekly period. The 2 technicians employed by ONC since 2001 to conduct the interviews have 15 and 45 years of subsistence fishing experience in the Kuskokwim River.

The interview format was developed in conjunction with staff from ADF&G, USFWS, and ONC. A draft copy of the interview format was provided to RAC and Working Group members for comment. ADF&G staff took the lead in coordinating and finalizing the interview format and protocols (Appendix A). Questions on the form included: family name, community of residence, date household began fishing, fish camp location, fishing area, season harvest goals by species, qualitative assessment of weekly fishing success, progress toward achieving harvest goals, gear types, general comments about fishing conditions, opinion on run timing, fishing difficulties, and the date the family completed salmon fishing for each species. The questions were designed to: 1) provide information from interviews with individual subsistence fishing families to index their relative fishing success, 2) determine relative harvest timing by area, 3) determine if fishers were selectively harvesting specific salmon species using particular mesh sizes or harvest methods, and 4) determine if there were factors other than fish abundance that may have affected the relative success of achieving their harvest goals. Fishers were specifically asked: "Compared with this time in a "Normal" year, how were your catch rates for salmon this week?" Their answers were categorized as very good, normal, or poor and together were viewed as an index of relative abundance.

Inseason subsistence surveys were conducted during the 2004 salmon fishing season in the lower Kuskokwim River (Bethel area) between Oscarville and the mouth of the Kwethluk River by ONC technicians in consultation with ADF&G staff (Figure 8). During 2004, technicians conducted weekly interviews of subsistence salmon fishers and summarized and reported the information to ADF&G, USFWS, and the Working Group for broader distribution to RAC members and other residents of the Kuskokwim River drainage (Appendix B). ADF&G staff trained technicians on interview techniques and methods for information management. Interviews were conducted by telephone and in person with fishers in fish camps along the mainstem Kuskokwim River or in their communities of residence in the Bethel area. Each week technicians would travel by skiff to 51 fish camps located downriver from Bethel in Napaskiak Slough to fish camps located in the Gweek River, upstream from Bethel, contacting the same general fish camp occupants during the 4 years the inseason survey has been in operation. These interviews were supplemented with opportunistic interviews of fishers at various locations in Bethel (i.e. Bethel boat ramp, personal communications at physical residences, etc). Weekly

interviews were conducted over the course of the season to track changes in fishing methods, fisher observations, and fisher perceptions pertaining to the salmon runs and harvests.

In a format provided by ADF&G staff, technicians edited and summarized subsistence salmon harvest information following the interview week. Collection of this information and distribution of the subsequent summaries provided a venue for local user input into the determination of salmon run abundance and corresponding management strategies. Completed inseason survey summaries (Appendix B) were generally received by ADF&G staff the Monday following the interview week and were distributed to Working Group members and meeting participants prior to Working Group meetings. The ONC Natural Resource Director regularly attended Working Group meetings and provided oral summaries of the interviews and survey technicians occasionally attended the meetings.

RESULTS

In 2004, ONC staff conducted inseason subsistence surveys from May 31 to August 21. Each week between 31 to 58 individual fishing families were interviewed regarding their subsistence fishing activities for the week. A total of 520 interviews were conducted in 2004 (Tables 6, 7, and 8). Twelve weekly summaries were prepared and presented at Working Group meetings (Appendix B).

The most intense fishing activity in the study area occurred during June, as this is the period of greatest Chinook salmon abundance. In June, a total of 150 interviews were conducted (Table 6); during this period 32% to 90% of families interviewed each week reported fishing (Table 7). By the end of June 109 interviews had reports of people fishing. Out of 109 interviews, 69% had reports of Chinook salmon fishing as very good, normal by 29%, and poor by 2%. During the weeks ending June 19 and June 26, 62 interviews had reports of families fishing (Table 6). Chum salmon fishing was described as very good in 45% of the 62 interviews while 55% of the 62 interviews had reports of fishing as normal. There were no reports of poor chum salmon fishing by interviewed fishing families during June. In the 62 interviews reporting families fishing during the weeks ending June 19 and 26, 15% described sockeye salmon fishing as very good, 79% of the interviews had reports that fishing for sockeye salmon was normal, and 6% reported sockeye salmon fishing as poor (Table 6). All interviewed fishing families in June reported using gillnets. Drift gillnet gear use was reported by 96% of interviews conducted in June while set gillnet gear use was reported by 16% of interviewed fishers (Table 9). Gillnets with mesh size > 6 inches are primarily utilized to target Chinook salmon, 77% of interviewed fishers used gillnets of this mesh size during the month of June. During a June 18 Working Group meeting, a decision was reached to go to 7 days per week subsistence fishing beginning June 20 (Whitmore and Martz 2005). An important source of information used by the Working Group was the most recent inseason harvest report from June 14 (Appendix B2) where 73% of the individual fishing families interviewed described Chinook fishing as very good and 22% as normal (Table 7).

Participation in the subsistence fishery by interviewed fishing families declined in July after the majority of the Chinook salmon run had migrated past the lower Kuskokwim River area (Tables 7 and 8). In July, 216 interviews were conducted with 56 reports of families fishing. During the weeks ending July 3, 10, and 17, 41 interviews had reports of fishing. During this period, fisher participation ranged from 17% to 50% of families interviewed each week. Chinook salmon

fishing was described as very good by 7% of the 41 reporting fishers and normal by 80%. There were no reports of Chinook salmon fishing being poor. Chum salmon fishing was described as very good in 43% of the 41 interviews and normal in 44% of 41 interviews. There were no reports of chum salmon fishing being poor, and there were no reports during the month of July that sockeye salmon fishing was good. Of the 41 interviews reporting fishing, 56% described sockeye fishing as normal while 32% described it as poor. Drift gillnets were used in July by 71% of the fishers interviewed, while 7% and 21% of those interviewed reported subsistence fishing with set gillnets and rod and reel gear, respectively. Approximately 79% of the interviewed fishers reported using gillnets with 6 inch or less mesh size suggesting that most were targeting chum and sockeye salmon (Table 9).

Fishing participation by interviewed families was low during the August interviews as fish were abundant and easy to catch. In August, 154 interviews were conducted, 46 interviews had reports of fishing. Of those 46 interviews, coho salmon fishing was reported to be good by 93% of participating fishers with 7% of the interviewed fishers reporting coho salmon fishing as normal. Drift gillnets were used by 70% of the interviewed fishers and rod and reel gear by 30%. One family reported using a set gillnet and all reports on mesh size were for the use of mesh size 6 inches or less.

Survey summaries (Appendix B) were presented at each Working Group meeting in 2004. Whitmore and Martz (2005) documented the Working Group's inclusion of this information in their discussions and recommendations. Of particular note was the action on June 18 from Whitmore and Martz (2005):

> *"During the June 18 meeting, a consensus was reached to liberalize the Kuskokwim River subsistence fishing schedule and go to a 7-day per week subsistence fishing schedule. It was noted that the BTF index for Chinook salmon was the highest on record and reports from the inseason subsistence monitoring program indicated that Chinook salmon catches were good and chum salmon catches were average for this time of year."*

DISCUSSION

Information used to manage the Kuskokwim River fisheries includes: subsistence harvest reports, test fish project summaries, and reports of salmon abundance from weir, sonar, and aerial survey programs as salmon approach clear water tributary spawning grounds. The inseason catch monitoring interviews are important in providing some of the first formal information pertaining to salmon abundance. Based on this information, comparisons of inseason subsistence catch information can be made among weeks, within a year, and among years (Tables 6 through 9, Appendix C). If the majority of interviewed fishers rate fishing as 'Very Good' for a given species and week it can provide general evidence that a particular run is performing well for that time. Likewise, if the majority of interviewed fishers rate subsistence fishing as being 'Poor' it would indicate a run is performing poorly for that time. Now that several years of catch monitoring reports have been collected, it is possible to compare responses among years. Used concurrently with Bethel test fish catch data, subsistence catch monitoring information can provide a general assessment on the abundance and timing of a particular run of salmon.

The majority of salmon harvested for subsistence uses in the Kuskokwim River are Chinook salmon (Figure 1). Since the directed commercial fishery for Chinook salmon was discontinued

in 1987, Chinook salmon subsistence harvest estimates have consistently surpassed the incidental harvest totals from yearly commercial fishing activities (Table 1). In 2004, the Bethel test fish index for Chinook salmon was the highest on record, the index for chum salmon was above average and the index for sockeye salmon was above average (Bue *in prep*). The majority of families interviewed during 2004 inseason subsistence surveys in the Bethel area indicated that Chinook, chum, and sockeye salmon fishing were at least normal or very good. The majority (≥ 60%) of interviewed fishers for each of the 4 years of the survey reported Chinook salmon fishing as 'Very Good' for the first 2 to 3 weeks of the survey. The percentage of interviewed families still fishing was greater than 50% (with the exception of 2002) for the first 4 weeks of the survey each year, suggesting that interviewed fishers near Bethel are targeting the majority of the Chinook salmon run (Appendix C). Consistent with this, Bethel test fish postseason catch numbers have estimated that 50% of the Chinook salmon run had passed Bethel during the 17 to 23 of June in the years 2001 to 2004 (Bue 2005), after which catch numbers have dropped as well as participation in the subsistence salmon fishery near Bethel by interviewed families. The average passage date for Chinook salmon in the Bethel test fishery from 1984 to 2004 was estimated to occur on June 21 (D. Bue, Division of Commercial Fisheries, ADF&G, Bethel; personal communication).

Chum, sockeye, and coho subsistence fishing descriptions from the inseason subsistence survey are difficult to compare between years because the number of interviewed families fishing vary from week to week, between years. Chum salmon fishing in the 2004 season was similar to the 2002 season by responses from interviewed fishing families (Appendix C) and Bethel test fish cumulative catch per unit effort comparisons (Bue *in prep*). Comparing descriptions of sockeye salmon fishing for the same years indicates that sockeye salmon fishing during 2004 was better than the 2002 season (Appendix C).

CONCLUSIONS

The mainstem Kuskokwim River is a corridor for salmon to access tributary spawning streams. Amounts necessary for subsistence are established on a drainage wide basis. Lower river subsistence fishers have the opportunity to harvest fish destined for spawning areas drainage wide while fishers in the middle and upper river areas only have access to fish that travel to tributary streams adjacent to or upstream from the areas that they generally fish. Therefore, during some years, fishers in the upper and middle portions of the Kuskokwim River might have less opportunity for subsistence salmon harvests than those in the lower river. Amounts necessary for subsistence drainage wide might be achieved during some years by increased harvests from lower, or lower and middle river fishers, while fishers in the middle or upper river may have less opportunity to achieve their harvest goals. Additionally, environmental factors such as high or low water events can influence the success or amount of effort inherent in achieving the BOF designation of amounts necessary for subsistence. Management of the Kuskokwim River subsistence salmon fishery is especially difficult because of the limited information that is available during the course of the salmon runs. Incorporating information from an inseason subsistence monitoring program into a management process is beneficial toward managing the Kuskokwim subsistence salmon fisheries. Collection of inseason harvest information early in the run is especially beneficial because run assessment information is limited to the test fish program, since salmon do not arrive at escapement monitoring programs until mid to late June and in the upper Kuskokwim area in July.

Each year the project has been implemented there has been an increase in the total number of interviews conducted and an increase in the frequency of interviewed fishing families contacted over the course of the season. The program has been well received by the subsistence fishers interviewed each year, who appreciate the opportunity to provide input to management of the Kuskokwim River fisheries. The information gathered by the inseason subsistence catch monitoring project has become vital to both Working Group members and State and Federal managers in making fishery management decisions.

In addition to providing information regarding fish availability, subsistence fishing effort, and qualitative catch rates, the inseason subsistence catch monitoring program provides feedback from subsistence fishers regarding the subsistence fishing schedule, and subsistence fishing closures around commercial fishing periods. This forum provided an excellent opportunity to discuss subsistence fishing issues with fishers and allows for an exchange of information toward developing a fishery management plan acceptable to a larger number of fishery participants.

Information provided by the inseason subsistence catch monitoring program significantly increased the quality and consistency of information obtained from subsistence fishers in 2004. The large number and frequency of interviews of individual fishing families increased the reliability of the salmon catch information. In combination with other information, inseason subsistence catch information was used to aid the decision making process of inseason management actions. The weekly reporting process resulted in discussions of survey data from the lower Kuskokwim River Area, which drew comments from Working Group members and fishers from the middle and upper river where surveys were not conducted. These discussions allowed fishers living and fishing upstream of the survey area to be briefed on surveyed fishing family catch rates in the lower river area and allowed lower river fishers to recognize the difference in fish availability (particularly Chinook salmon) in the middle and upper river. Specifically, discussions clearly described to lower river fishers the necessity of the subsistence fishing schedule early in the season to spread the Chinook salmon harvest across the run to provide for subsistence harvest uses for middle and upper river fishers.

Historically, fishery managers collected inseason information about subsistence activities ad hoc from subsistence fishers. This project has increased the number and frequency of fishing family interviews and has provided a broader representation of subsistence salmon catch information that more accurately reflects the status of the lower Kuskokwim River salmon fishery than information garnered ad hoc. Inseason subsistence catch information was used in conjunction with other information (such as Bethel test fish catch indices) to determine inseason management decisions. Now that multiple years of information have been collected, information on an 'in progress' Kuskokwim River fishery can be compared to prior years' information. In this way inseason subsistence catch information becomes useful in implementing fishery management actions directed towards achieving escapement goals, providing for a subsistence use priority, and, if harvestable surpluses of salmon are available, to provide an opportunity for other fisheries. Timely evaluation of inseason subsistence catch information has the potential to increase the precision of the Kuskokwim River fishery management system by allowing local subsistence salmon users a venue for input into the determination of salmon run abundance and corresponding management strategies.

RECOMMENDATIONS

We recommend this program be continued to provide information to assist in fishery management decisions concerning Chinook and chum salmon run assessments in the lower Kuskokwim River. During late May to mid July, salmon run assessment information is limited to the Bethel test fishery and is generally not available from escapement monitoring programs. Subsistence information from the lower river is beneficial in assisting inseason management actions. We recommend that the project objectives be modified to index assessment of Chinook and chum salmon run timing and relative abundance rather than determine the adequacy and quality of fish harvested. The program should be implemented beginning the last week of May, just as the fishery is getting started, and should continue through mid July as Chinook salmon run strength and subsistence fisher participation declines. Interviews should be conducted regularly and in a consistent manner. Interview survey forms should be completely filled out during each interview. We also recommend adding questions seeking the fishers' assessment of run timing and attempt to understand the basis for the "Normal" year comparison (for example as being recent or historical) (Appendix A). This "basis" should be noted for each family to aid in interpretation of the relative abundance responses. We recommend that a numerical equivalent be provided for fishers to scale catch rates from 1 to 10 (10 as best), such that 1–3 is poor, 4–7 is normal, and 8–10 is very good, be provided. Technicians conducting the inseason subsistence surveys should insure each fisher has a subsistence catch calendar in their possession and that the fisher fills out the calendar on at least a weekly basis. Fishery managers and Working Group members should be encouraged to accompany technicians in order to become more familiar with the program.

Modifications that may enhance the quality, and speed the completion of future reports include: having ONC provide completed data forms (modified to remain confidential) to ADF&G after the season in the event questions arise regarding details on weekly summary sheets, and allowing survey technicians to distribute subsistence salmon catch calendars to interviewed subsistence fishers.

We recommend the project objectives be modified as follows:

OBJECTIVES

1. Index salmon run timing and relative abundance in May, June, and July through weekly interviews with Bethel Area subsistence salmon fishers.
2. Index fishing activity and gear usage through weekly interviews with Bethel Area subsistence salmon fishers in May, June, and July.
3. Provide local input into the management process for the salmon subsistence fishery in May, June, and July through the presentation of weekly summaries of interviews with Bethel Area subsistence salmon fishers at Kuskokwim River Salmon Management Working Group meetings.
4. Provide cross training to an ONC technician in other ADF&G and USFWS projects for up to two weeks.

ACKNOWLEDGEMENTS

We wish to thank the technicians, Byron Dull and Moses Anvil Jr. from the Orutsararmiut Native Council (ONC) who gathered the information needed to complete harvest data surveys in

season. Thanks to those that reviewed this document: Linda Brannian and Doug Bue, Division of Commercial Fisheries, Alaska Department of Fish and Game; Greg Roczicka, ONC; and Polly Wheeler, Office of Subsistence Management, Fisheries Information Services (FIS), United States Fish and Wildlife Service (USFWS). Special thanks to Greg Roczicka of ONC for his excellent supervision of data collection, summarizing and reporting weekly survey results.

The USFWS, Office of Subsistence Management, provided $16,325 in funding support to ADF&G for this project (FIS 04-353) through the Fisheries Resource Monitoring Program, under purchase order IHP-04-083. An additional agreement was made with ONC for FIS 04-353 through the Fisheries Resource Monitoring Program to provide $46,124 for total FIS program funding of $62,449.

REFERENCES CITED

ADF&G, Division of Subsistence. 2003. Alaska subsistence fisheries 2002 annual report. Alaska Department of Fish and Game, Division of Subsistence, Juneau.

ADF&G, Division of Subsistence. *In press*. Alaska subsistence fisheries 2003 annual report. Alaska Department of Fish and Game, Division of Subsistence, Juneau.

Bergstrom, D. J. and C. Whitmore. 2004. Kuskokwim River chinook and chum salmon stock status and action plan. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A04-02, Anchorage.

Burkey, C., M. Coffing, D. B. Molyneaux, and P. Salomone. 2000. Kuskokwim River chinook salmon stock status and development of management/action plan options. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A00-40, Anchorage.

Brown, C. M. 1983 (draft). Alaska's Kuskokwim River region: a history. Bureau of Land Management, Anchorage.

Bue, D. G. 2005. Data summary for the Kuskokwim River salmon test fishery at Bethel, 1984–2003. Alaska Department of Fish and Game, Fishery Data Series No. 05-14, Anchorage.

Bue, D. G. *In prep*. The Kuskokwim River salmon test fishery at Bethel, 2004. Alaska Department of Fish and Game, Fishery Data Series, Anchorage.

Coffing, Michael W. 1991. Kwethluk Subsistence: contemporary land use patterns, wild resource harvest and use, and the subsistence economy of a Lower Kuskokwim River Area community. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 157. Juneau.

Molyneaux, D. B., D. Folletti, L. DuBois, G. Roczicka, and W. Morgan. 2004a. Age, sex, and length composition of Chinook salmon from the 2002 Kuskokwim River subsistence fishery. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A04-13, Anchorage.

Molyneaux, D. B., D. Folletti, L. K. Brannian, L., G. Roczicka, W. Morgan. 2004b. Age, sex, and length composition of Chinook salmon from the 2003 Kuskokwim River subsistence fishery. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A04-23, Anchorage.

Mundy, P. R. 1995. Recommendations for strengthening the cooperative process of the Kuskokwim River Salmon Management Working Group. Final Report.

Ward, T. C., M. Coffing, J. L. Estensen, R. L. Fisher, and D. B. Molyneaux. 2003. Annual management report for the subsistence and commercial fisheries of the Kuskokwim Area 2002. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A04-27, Anchorage.

Whitmore, C. and M. Martz. 2005. Activities of the Kuskokwim salmon management working group, 2003 through 2004. Alaska Department of Fish and Game, Fishery Management Report No. 05-25, Anchorage.

Whitmore, C., S. L. McNeil, and L. K. Brannian. 2004. Kuskokwim River inseason subsistence salmon harvest data collection, 2001-2003. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 3A04-27, Anchorage.

TABLES AND FIGURES

Table 1.–Historical utilization of Chinook salmon in the Kuskokwim River.

	Commercial Harvest[a]		Subsistence Harvest[b]		TestFish	Sport Fish	Total	10-Year
Year	Annual	10-yr Ave.	Annual	10-yr Ave.	Harvest	Harvest	Utilization	Average
1960	5,969		18,887				24,856	
1961	18,918		28,934				47,852	
1962	15,341		13,582				28,923	
1963	12,016		34,482				46,498	
1964	17,149		29,017				46,166	
1965	21,989		24,697				46,686	
1966	25,545		49,325		285		75,155	
1967	29,986		59,913		766		90,665	
1968	34,278		32,942		608		67,828	
1969	43,997	22,519	40,617	33,240	833		85,447	56,008
1970	39,290	25,851	69,612	38,312	857		109,759	64,498
1971	40,274	27,987	43,242	39,743	756		84,272	68,140
1972	39,454	30,398	40,396	42,424	756		80,606	73,308
1973	32,838	32,480	39,093	42,885	577		72,508	75,909
1974	18,664	32,632	27,139	42,698	1,236		47,039	75,997
1975	22,135	32,646	48,448	45,073	704		71,287	78,457
1976	30,735	33,165	58,606	46,001	1,206		90,547	79,996
1977	35,830	33,750	56,580	45,668	1,264	33	93,707	80,300
1978	45,641	34,886	36,270	46,000	1,445	116	83,472	81,864
1979	38,966	34,383	56,283	47,567	979	74	96,302	82,950
1980	35,881	34,042	59,892	46,595	1,033	162	96,968	81,671
1981	47,663	34,781	61,329	48,404	1,218	189	110,399	84,284
1982	48,234	35,659	58,018	50,166	542	207	107,001	86,923
1983	33,174	35,692	47,412	50,998	1,139	420	82,145	87,887
1984	31,742	37,000	56,930	53,977	231	273	89,176	92,100
1985	37,889	38,576	43,874	53,519	79	85	81,927	93,164
1986	19,414	37,443	51,019	52,761	130	49	70,612	91,171
1987	36,179	37,478	67,325	53,835	384	355	104,243	92,225
1988	[c] 55,716	38,486	70,943	57,303	576	528	127,763	96,654
1989	43,217	38,911	80,726	59,747	543	1,218	125,704	99,594
1990	53,504	40,673	85,979	62,356	512	394	140,389	103,936
1991	37,778	39,685	85,554	64,778	117	401	123,850	105,281
1992	46,872	39,549	64,795	65,456	1,380	367	113,414	105,922
1993	8,735	37,105	87,512	69,466	2,483	587	99,317	107,640
1994	16,211	35,552	93,242	73,097	1,937	1,139	112,529	109,975
1995	30,846	34,847	96,436	78,353	1,421	541	129,244	114,707
1996	7,419	33,648	78,063	81,058	247	1,432	87,161	116,361
1997	10,441	31,074	81,577	82,483	332	1227	93,577	115,295
1998	17,359	27,238	81,265	83,515	210	1434	100,268	112,545
1999	4,705	23,387	73,193	82,762	98	252	78,248	107,800
2000	444	18,081	64,893	80,653	64	105	65,506	100,311
2001	90	14,312	73,610	79,459	86	290	74,076	95,334
2002	72	9,632	65,998	79,579	288	300	66,658	90,658
2003	158	8,775	66,402	77,468	409	401	67,370	87,464
2004	2,300	7,383			691	[d]	[d]	
10-Yr. Ave. ('94–'03)	8,775		77,468		509	712	87,464	

[a] Districts 1 and 2; also includes harvests in District 3 from 1960 to 1965.
[b] Estimated subsistence harvest expanded from villages surveyed.
[c] Beginning in 1988, subsistence estimates are based on a new formula so data since 1988 is not comparable with previous years.
[d] Data not yet available.

Table 2.–Historical utilization of chum salmon in the Kuskokwim River.

Year	Commercial Harvest[a] Annual	Commercial Harvest[a] 10-yr Ave.	Subsistence Harvest[b] Annual	Subsistence Harvest[b] 10-yr Ave.	Test-Fish Harvest	Sport Fish Harvest	Total Utilization	10-Year Average
1960	0		[c] 301,753				301,753	
1961	0		[c] 179,529				179,529	
1962	0		[c] 161,849				161,849	
1963	0		[c] 137,649				137,649	
1964	0		[c] 190,191				190,191	
1965	0		[c] 250,878				250,878	
1966	0		[c] 175,735		502 [d]		176,237	
1967	148		[c] 208,445		338		208,931	
1968	187		[c] 275,008		562		275,757	
1969	7,165	750	[c] 204,105		384		211,654	209,443
1970	1,664	916	[c] 246,810	203,020	1,139 [d]		249,613	204,229
1971	68,914	7,808	[c] 116,391	196,706	254		185,559	204,832
1972	78,619	15,670	[c] 120,316	192,553	486		199,421	208,589
1973	148,746	30,544	[c] 179,259	196,714	675		328,680	227,692
1974	171,887	47,733	[c] 277,170	205,412	2,021		451,078	253,781
1975	184,171	66,150	[c] 176,389	197,963	1,062		361,622	264,855
1976	177,864	83,937	[c] 223,792	202,769	2,101		403,757	287,607
1977	248,721	108,794	[c] 198,355	201,760	576	125	447,777	311,492
1978	248,656	133,641	[c] 118,809	186,140	2,153	555	370,173	320,933
1979	261,874	159,112	[c] 161,239	181,853	412	259	423,784	342,146
1980	483,751	207,320	[c] 165,172	173,689	2,058	324	651,305	382,316
1981	418,677	242,297	[c] 157,306	177,781	1,793	598	578,374	421,597
1982	278,306	262,265	[c] 190,011	184,750	504	1125	469,946	448,650
1983	276,698	275,061	[c] 146,876	181,512	1,069	922	425,565	458,338
1984	423,718	300,244	[c] 142,542	168,049	1,186	520	567,966	470,027
1985	199,478	301,774	94,750	159,885	616	150	294,994	463,364
1986	309,213	314,909	[c] 141,931	151,699	1,693	245	453,082	468,297
1987	574,336	347,471	70,709	138,935	2,302	566	647,913	488,310
1988	[e] 1,381,674	460,773	151,967	142,250	4,379	764	1,538,784	605,171
1989	749,182	509,503	139,687	140,095	2,082	2023	892,974	652,090
1990	461,624	507,291	126,508	136,229	2,107	533	590,772	646,037
1991	431,802	508,603	93,075	129,806	931	378	526,186	640,818
1992	344,603	515,233	96,491	120,454	15,330	608	457,032	639,527
1993	43,337	491,897	59,396	111,706	8,451	359	111,543	608,125
1994	271,115	476,636	72,025	104,654	11,998	1280	356,418	586,970
1995	605,918	517,280	67,862	101,965	17,473	226	691,479	626,618
1996	207,877	507,147	88,965	96,669	2,864	280	299,986	611,309
1997	17,026	451,416	39,970	93,595	790	86	57,872	552,305
1998	207,809	334,029	63,537	84,752	1,140	291	272,777	425,704
1999	23,006	261,412	43,601	75,143	562	180	67,349	343,141
2000	11,570	216,406	51,696	67,662	1,038	26	64,330	290,497
2001	1,272	173,353	49,874	63,342	1,743	112	53,001	243,179
2002	1,900	139,083	67,049	60,398	2,666	53	71,668	204,642
2003	2,764	135,026	42,350	58,693	1,713	53	46,880	198,176
2004	20,429	109,957	[f]		509	[f]	[f]	
10-Yr. Ave. (94-03)	124,608		58,693		3,863	259	198,176	

[a] Districts 1 and 2 only; no chum harvests were reported in District 3.
[b] Estimated subsistence harvest expanded from villages surveyed.
[c] Includes small numbers of small Chinook, sockeye and coho salmon.
[d] Includes small numbers of sockeye.
[e] Beginning in 1988, subsistence estimates are based on a new formula so data since 1988 is not comparable with previous years.
[f] Data not yet available.

Table 3.–Historical utilization of sockeye salmon in the Kuskokwim River.

	Commercial Harvest		Subsistence Harvest [a]		Test Fish	Sport Fish	Total	10-Year
Year	Annual	10-yr Ave.	Annual	10-yr Ave.	Harvest	Harvest	Utilization	Average
1960								
1961								
1962								
1963								
1964								
1965								
1966								
1967								
1968								
1969	322	322					322	
1970	117	220					117	
1971	2,606	1,015					2,606	
1972	102	787					102	
1973	369	703					369	
1974	136	609					136	
1975	23	525					23	
1976	2,971	831					2,971	
1977	9,379	1,781					9,379	
1978	733	1,676					733	
1979	1,054	1,749					1,054	
1980	360	1,773					360	
1981	48,375	6,350					48,375	
1982	33,154	9,655					33,154	
1983	68,855	16,504				41	68,896	16,508
1984	48,575	21,348					48,575	21,352
1985	106,647	32,010				72	106,719	32,022
1986	95,433	41,257				196	95,629	41,287
1987	136,602	53,979				217	136,819	54,031
1988	[b] 92,025	63,108				291	92,316	63,190
1989	42,747	67,277	35,224			33	78,004	70,885
1990	84,870	75,728	36,276			61	121,207	82,969
1991	108,946	81,785	52,984			38	161,968	94,329
1992	92,218	87,692	32,067			131	124,416	103,455
1993	27,008	83,507	49,349			348	76,705	104,236
1994	49,365	83,586	37,159			359	86,883	108,067
1995	92,500	82,171	27,791			95	120,386	109,433
1996	33,878	76,016	34,213			315	68,406	106,711
1997	21,989	64,555	40,097			423	62,509	99,280
1998	60,906	61,443	35,425	38,059		178	96,509	99,699
1999	16,976	58,866	46,707	39,207		54	63,737	98,273
2000	4,130	50,792	41,783	39,758		46	45,959	90,748
2001	84	39,905	50,065	39,466	510	231	50,890	79,640
2002	84	30,692	24,714	38,730	228	26	25,052	69,704
2003	282	28,019	33,815	37,177	646	140	34,883	65,521
2004	9,748	24,058	[c]		742		[c]	[c]
10-Yr. Ave. ('94–'03)	28,019		37,177		532	187	65,915	

[a] Estimated subsistence harvest expanded from villages surveyed.

[b] Beginning in 1988, subsistence estimates are based on a new formula so data since 1988 is not comparable with previous years.

[c] Data not yet available.

Table 4.–Historical utilization of coho salmon in the Kuskokwim River.

	Commercial Harvest		Subsistence Harvest [a]		Test Fish	Sport Fish	Total	10-Year
Year	Annual	10-Yr Ave.	Annual	10-Yr Ave.	Harvest	Harvest	Utilization	Average
1960	2,498							
1961	5,044							
1962	12,432							
1963	15,660							
1964	28,613							
1965	12,191							
1966	22,985							
1967	56,313							
1968	127,306							
1969	83,765	36,681						
1970	38,601	40,291						
1971	5,253	40,312						
1972	22,579	41,327						
1973	130,876	52,848						
1974	147,269	64,714						
1975	81,945	71,689						
1976	88,501	78,241						
1977	241,364	96,746						
1978	213,393	105,355						
1979	219,060	118,884						
1980	222,012	137,225						
1981	211,251	157,825						
1982	447,117	200,279						
1983	196,287	206,820				1,375	197,662	
1984	623,447	254,438				1,442	624,889	
1985	335,606	279,804				136	335,742	
1986	659,988	336,953				1,222	661,210	
1987	399,467	352,763				1,767	401,234	
1988 [b]	524,296	383,853				927	525,223	
1989	479,856	409,933	52,918			2,459	535,233	
1990	410,332	428,765	44,791			581	455,704	
1991	500,935	457,733	50,670			1,003	552,608	
1992	666,170	479,638	40,168			1,692	708,030	
1993	610,739	521,084	31,737			980	643,456	
1994	724,689	531,208	33,050			1,925	759,664	
1995	471,461	544,793	36,277			1,497	509,235	
1996	937,299	572,524	32,741			3,423	973,463	
1997	130,803	545,658	29,032		33,733 [c]	2,408	195,976	585,859
1998	210,481	514,277	24,864	37,625		2,419	237,764	557,113
1999	23,593	468,650	25,004	34,833	213 [d]	1,998	50,808	508,671
2000	261,379	453,755	33,786	33,733	2,828 [d]	1,689	299,682	493,069
2001	192,998	422,961	29,504	31,616	1,723 [d]	1,204	225,429	460,351
2002	83,463	364,691	32,115	30,811	2,484 [d]	2,030	120,092	401,557
2003	284,064	332,023	34,472	31,085	2,377 [d]	3,244	324,157	369,627
2004	433,809	302,935			2,259 [d]	[e]	[e]	
10-Yr. Ave. ('94–'03)	332,023		31,085		7,226	2,184	369,627	

[a] Estimated subsistence harvest expanded from villages surveyed.
[b] Beginning in 1988, subsistence estimates are based on a new formula so data since 1988 is not comparable with previous years.
[c] Includes Bethel and Aniak test fisheries.
[d] Bethel test fishery only.
[e] Data not yet available.

Table 5.–District 1, Kuskokwim River, commercial fishing and subsistence closure hours, 2004.

Period Number	Date	Subdistrict	Hours fished	Total hours of Subsistence closures
1	Jun 30	1B	2	11
2	Jul 02	1A	3	12
3	Jul 06	1A	3	12
4	Jul 07	1B	4	13
5	Jul 28	1A	4	13
6	Jul 30	1B	4	13
7	Aug 02	1A	6	15
8	Aug 03	1B	6	15
9	Aug 05	1A	6	15
10	Aug 06	1B	6	15
11	Aug 09	1A	6	15
12	Aug 10	1B	6	15
13	Aug 12	1A	6	15
14	Aug 13	1B	6	15
15	Aug 16	1A	6	15
16	Aug 17	1B	6	15
17	Aug 19	1A	6	15
18	Aug 20	1B	6	15
19	Aug 23	1A-1B	8	17
20	Aug 24	1A-1B	8	17
21	Aug 27	1A-1B	8	17
22	Aug 30	1A-1B	8	17
23	Sep 02	1A-1B	6	15
24	Sep 04	1A-1B	6	15
25	Sep 06	1A-1B	6	15
26	Sep 08	1A-1B	6	15
Total			148	382

Table 6.–Kuskokwim River inseason subsistence summary report, summary of salmon fishing, 2004.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]															
	Number of Families			Chinook salmon			Chum salmon			Sockeye salmon			Coho salmon		
Week ending	Interviewed	Fishing	Not Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 05	31	10	21	6	4	0									
Jun 12	41	37	4	27	8	2									
Jun 19	35	31	4	23	8	0	4	27	0	4	27	0			
Jun 26	43	31	12	19	12	0	24	7	0	5	22	4			
Jul 03	44	22	22	3	17	0	10	10	0	0	13	7			
Jul 10	44	13	31	0	10	0	8	2	0	0	4	6			
Jul 17	35	6	29	0	6	0	0	6	0	0	6	0	0	6	0
Jul 24	46	8	38										0	8	0
Jul 31	47	7	40										7	0	0
Aug 07	58	22	36										19	3	0
Aug 14	44	16	28										16	0	0
Aug 21	52	8	44										8	0	0
Total [b]	520														
Average	43	18	26	11	9	0	9	10	0	2	14	3	8	3	0

[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Table 7.–Kuskokwim River Chinook and chum salmon subsistence summary, quality of fishing report, 2004.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]									
Week	Number		Percent	% Describing Chinook fishing			% Describing Chum fishing as		
ending	Interviewed	Fishing	Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 05	31	10	32%	60%	40%	0%			
Jun 12	41	37	90%	73%	22%	5%			
Jun 19	35	31	89%	74%	26%	0%	13%	87%	0%
Jun 26	43	31	72%	61%	39%	0%	77%	23%	0%
Jul 03	44	22	50%	14%	77%	0%	45%	45%	0%
Jul 10	44	13	30%	0%	77%	0%	62%	15%	0%
Jul 17	35	6	17%	0%	100%	0%	0%	100%	0%
Jul 24	46	8	17%						
Jul 31	47	7	15%						
Aug 07	58	22	38%						
Aug 14	44	16	36%						
Aug 21	52	8	15%						
Total [b]	520								
Average	43	18							

[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Table 8.–Kuskokwim River sockeye and coho salmon subsistence summary, quality of fishing report 2004.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]									
Week	Number		Percent	% Describing Sockeye fishing as			% Describing Coho fishing as		
ending	Interviewed	Fishing	Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 05	31	10	32%						
Jun 12	41	37	90%						
Jun 19	35	31	89%	13%	87%	0%			
Jun 26	43	31	72%	16%	71%	13%			
Jul 03	44	22	50%	0%	59%	32%			
Jul 10	44	13	30%	0%	31%	46%			
Jul 17	35	6	17%	0%	100%	0%	0	100%	0%
Jul 24	46	8	17%				0%	100%	0%
Jul 31	47	7	15%				100%	0%	0%
Aug 07	58	22	38%				86%	14%	0%
Aug 14	44	16	36%				100%	0%	0%
Aug 21	52	8	15%				100%	0%	0%
Total [b]	520								
Average	43	18							

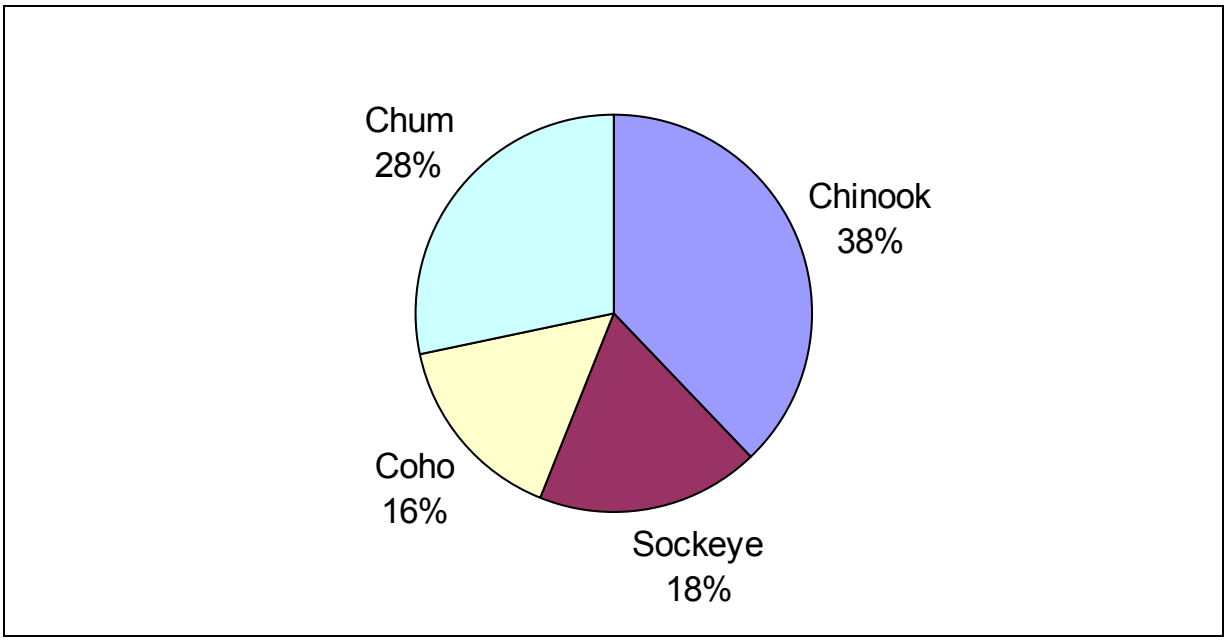
[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Table 9.–Kuskokwim River inseason subsistence survey fishing gear use summary, 2004.

Summary of Subsistence Salmon Information Collected by ONC Technicians							
Week	**Number of Families**						
ending	**Interviewed**	**Fishing**	**Using Driftnet**	**Using Setnet**	**Using Rod & Reel**	**Gillnets > 6"**	**Gillnets < 6"**
Jun 05	31	10	6	7		10	0
Jun 12	41	37	37	8		37	0
Jun 19	35	31	31	3		29	7
Jun 26	43	31	31	0		8	26
Jul 03	44	22	17	0	5	2	17
Jul 10	44	13	10	0	3	0	10
Jul 17	35	6	4	1	1	0	5
Jul 24	46	8	4	2	2	0	6
Jul 31	47	7	5	1	1		6
Aug 07	58	22	13	0	9		13
Aug 14	44	16	13	1	3		13
Aug 21	52	8	6	0	2		6
Total [a]	520						
Average	43	18	15	2	3	11	9

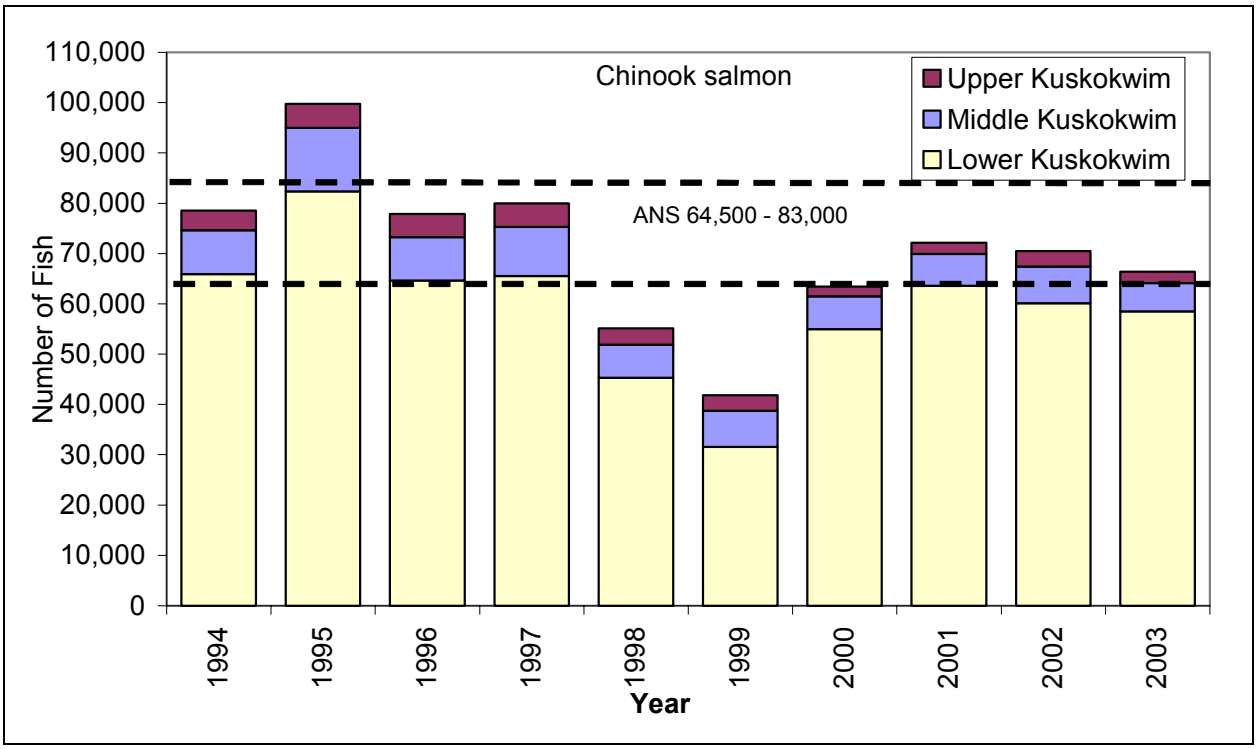
[a] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.



Note: N = 216,617 salmon; based on annual harvest assessment program using calendars and household surveys. 10-year average, 1994–2003.

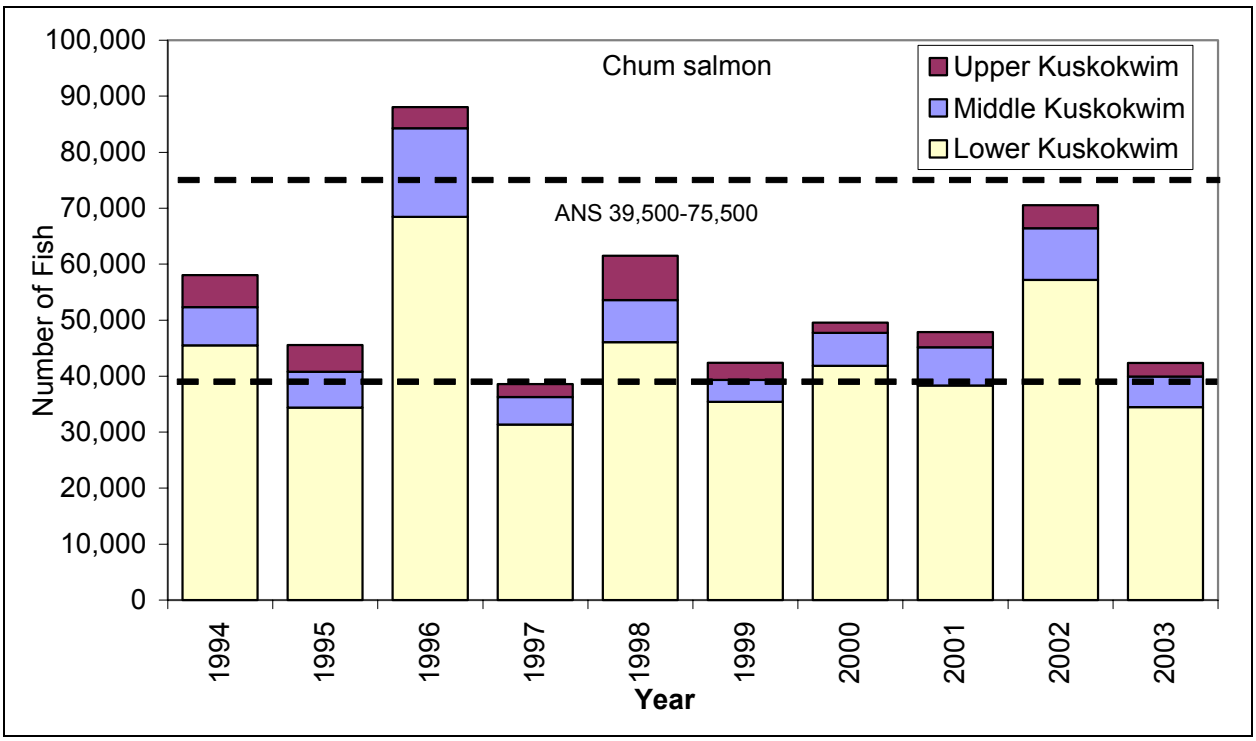
Source: ADF&G *in press*.

Figure 1.–Composition of subsistence harvest by species as reported by postseason harvest surveys, Kuskokwim Area, 10-year average, 1994–2003.



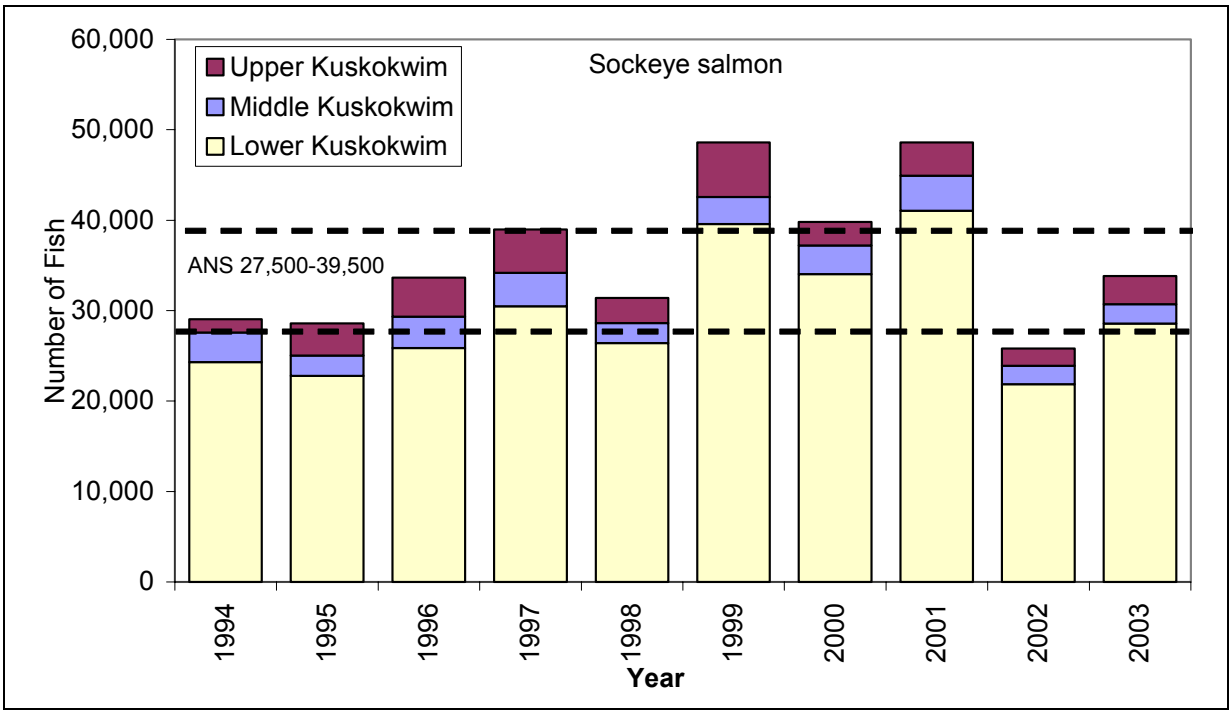
Note: ANS = amount necessary for subsistence.

Figure 2.–Subsistence Chinook salmon harvest as reported by postseason harvest surveys, Kuskokwim River, 1994–2003.



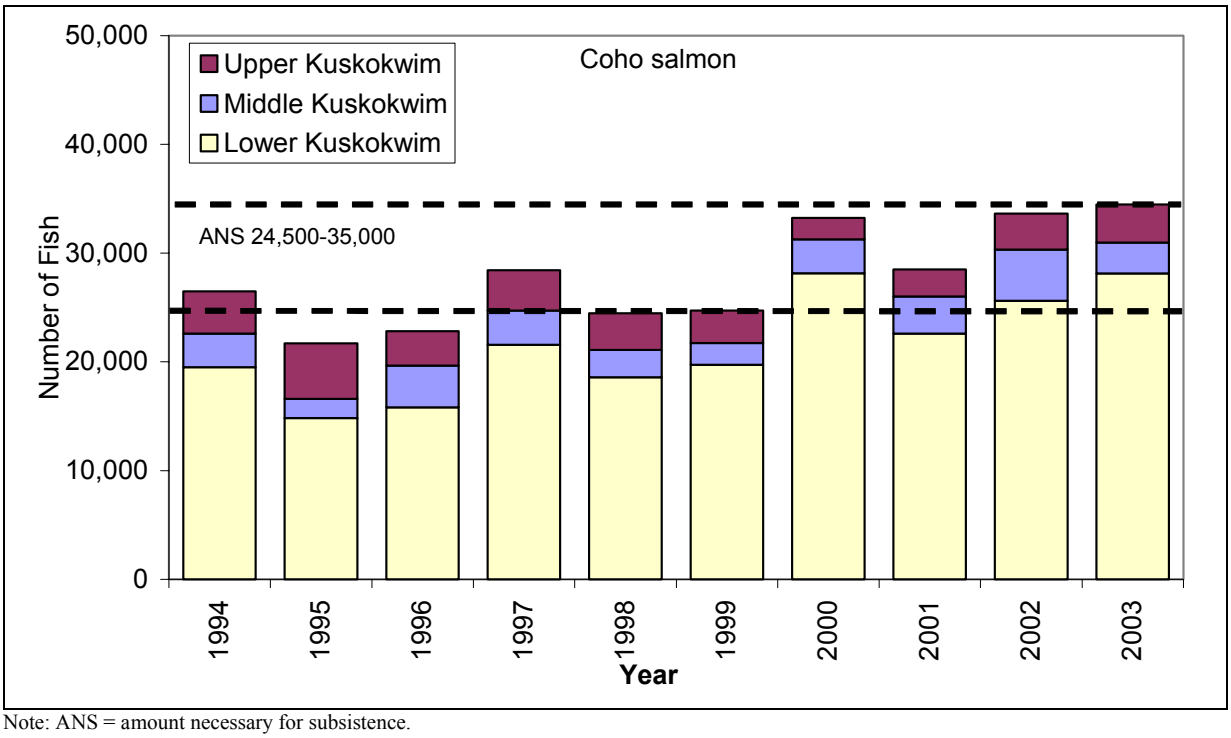
Note: ANS = amount necessary for subsistence.

Figure 3.–Subsistence chum salmon harvest as reported by postseason harvest surveys, Kuskokwim River, 1994–2003.



Note: ANS = amount necessary for subsistence.

Figure 4.–Subsistence sockeye salmon harvest as reported by postseason harvest surveys, Kuskokwim River, 1994–2003.



Note: ANS = amount necessary for subsistence.

Figure 5.–Subsistence coho salmon harvest as reported by postseason harvest surveys, Kuskokwim River, 1994–2003.

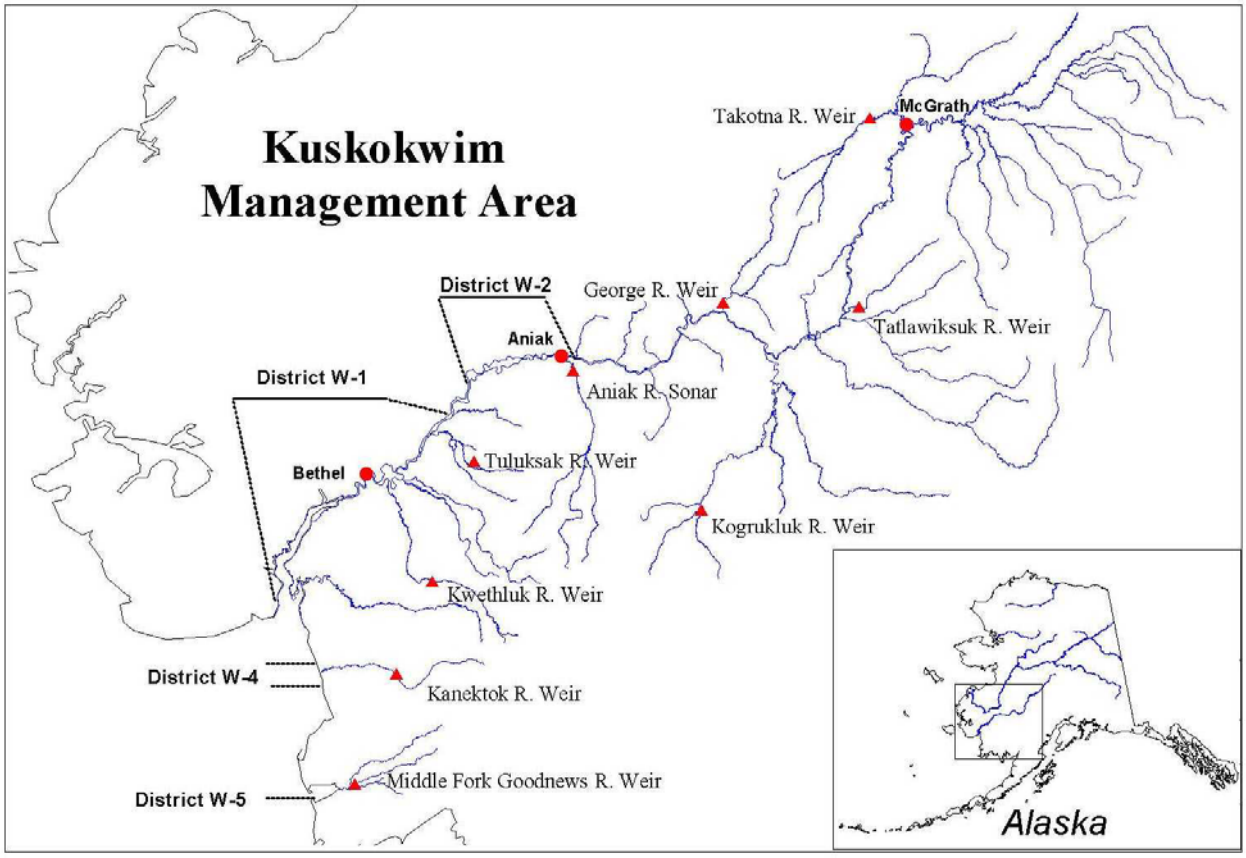
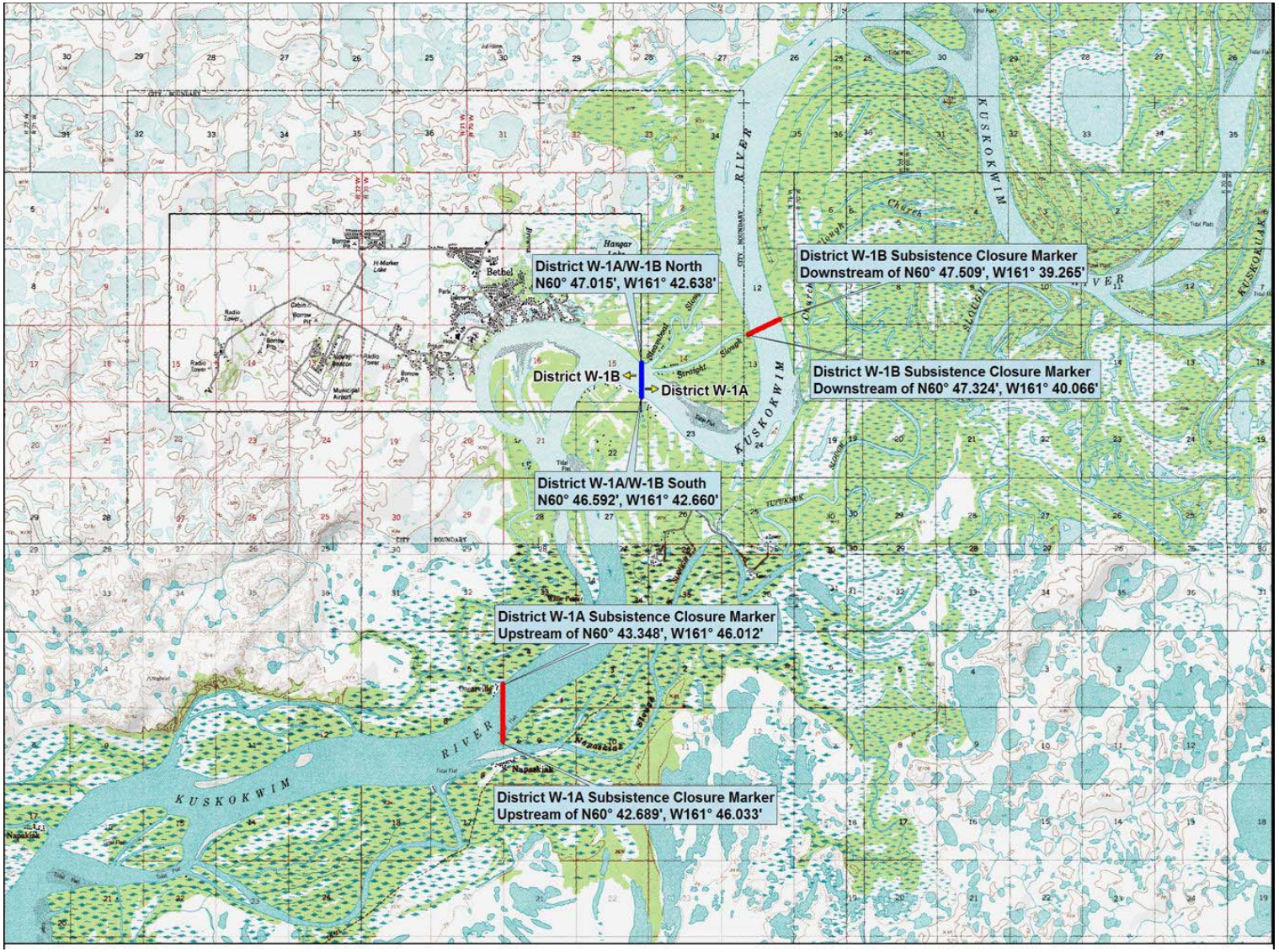


Figure 6.–Kuskokwim Management Area.



Note: Bethel Area commercial salmon sub-district W-1A and W-1B boundary and subsistence salmon fishing closure boundaries during sub-district W1-A and W-1B commercial openings (ADF&G 2004).
Source: Map not to scale. © 2002 DeLorme (www.delorme.com) 3-D TopoQuads®

Figure 7.–District 1, Subdistricts 1-A and 1-B.

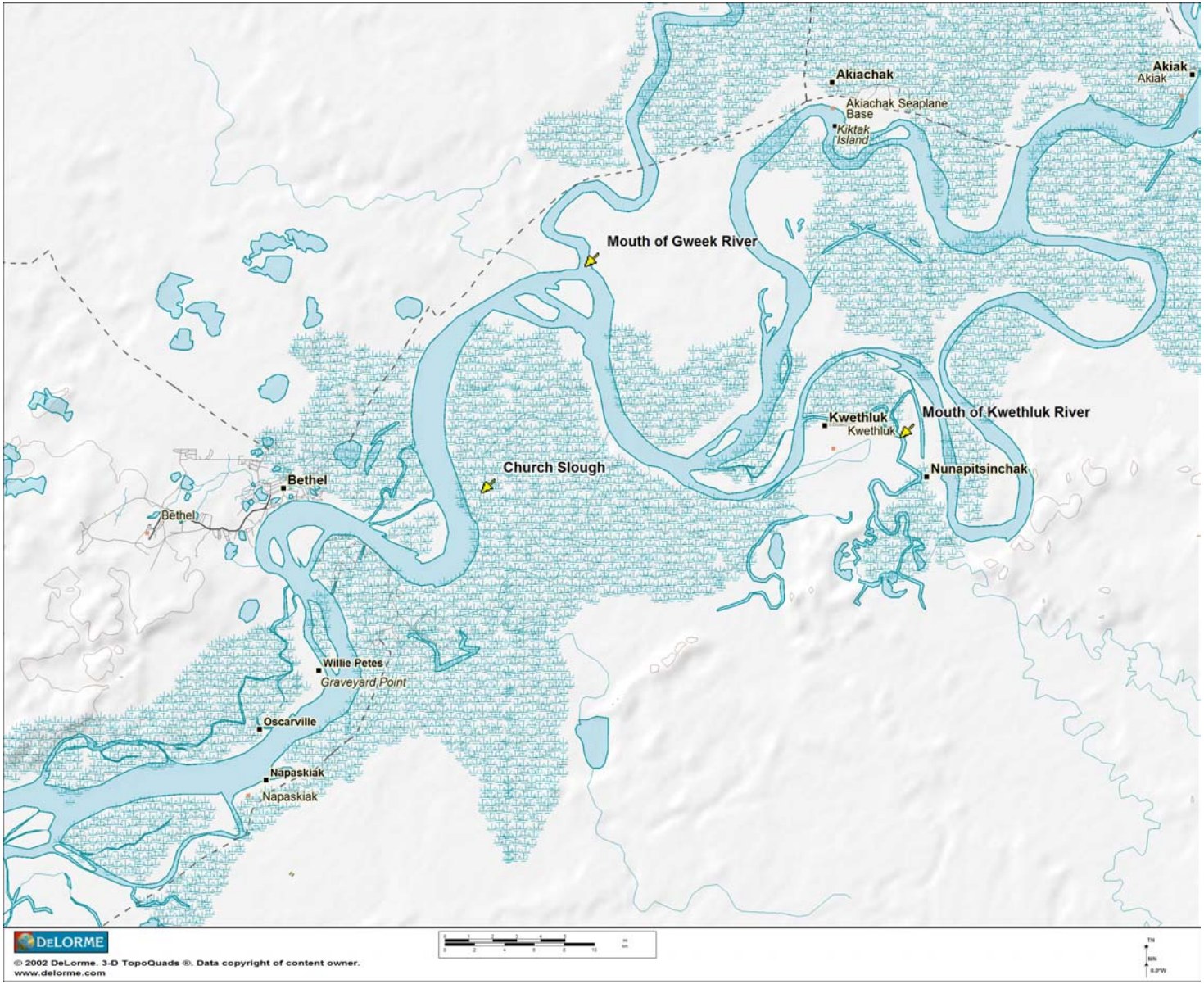


Figure 8.–Subsistence survey area, 2004.

APPENDIX A. EXAMPLE OF SURVEY INSTURMENT

Appendix A.–Example of 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 _____, Chum _____, Sockeye _____, Coho _____
Chinook " Red " " Silver "

		Salmon Fishing Gear Used This Week						Compared with this time in a "NORMAL" year, how were catch rates for salmon this week?									Comments about salmon fishing this week?
		Net Type		Mesh ?				King Salmon			Chum Salmon			Sockeye Salmon			Few fish ? Lot of fish ? Are fish early / late? Water levels?
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	Size of Fish ? Fish look healthy ? Fishing harder this year ? Fishing in more places/areas than usual
	5-Jun																
	12-Jun																
	19-Jun																
	26-Jun																
	3-Jul																
	10-Jul																
	17-Jul																
	24-Jul																
	31-Jul																

		Net Type					Chum Salmon			Coho Salmon			Comments about salmon fishing this week?
Staff initials	Week Ending	Drift Net	Set Net		Rod Reel	Fish Wheel	Very Good	OK Normal	Poor	Very Good	OK Normal	Poor	Few fish ? Lot of fish ? Are fish early / late? Water levels? Size of Fish Fish look healthy ? Fishing harder this year ?
	7-Aug												
	14-Aug												
	21-Aug												
	28-Aug												

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

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

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

Appendix B1.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, June 7, 2004.

Fishing ending the week of June 05, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
31	6	7	0	10	0

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
6	4	0	0	0	0	0	0	0	0	0	0

Chinook:

Out of the fishermen interviewed; 5 reported the king run was early this year, and 3 reported that it's still a little early but expect that next week the run will be more plentiful.

Chum:

Of the 10 families fishing, all stated that it was far too early to make any determination of how the chum run will develop. No families reported catching chum salmon.

Sockeye:

Of the 10 families fishing, all stated that it was far too early to make any determination of how the sockeye run will develop. No families reported catching sockeye salmon.

Summary:

Many people have not actively started fishing yet and were unavailable for interviews, but most who have report that the king run appears to be good so far this year. All stated the expectation that fish will be running strong and hard next week. Staff focused efforts this week on distributing ASL sample kits and initial or refreshment training for individuals to gather the information.

Appendix B2.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, June 14, 2004.

Fishing ending the week of June 12, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
41	37	8	0	37	0

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
27	8	2	0	0	0	0	0	0	0	0	0

Chinook:

Out of the fishermen interviewed; 12 reported that the king run was better than last week, 6 reported that fishing is hard due to the amount of other fishermen in the river, and 5 reported that although the run is better this week the Kings are becoming smaller in size due to being later in the first run.

Chum:

A few fishermen reported some chum catches, which is normal for this time of year but most fishermen reported that it's still too early to determine what the run will be like.

Sockeye:

No additional comments.

Summary:

Many people have started fishing this week and report that the run is going very good, although for some fishermen that fish around Bethel, they are having trouble due to the amount of other fishermen on the river. As for chums and sockeye, the runs are expected to pick up slowly by the opening of next weeks fishing period.

Appendix B3.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, June 21, 2004.

Fishing ending the week of June 19, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
35	31	3	0	29	7

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
23	8	0	4	27	0	4	27	0	0	0	0

Chinook:

Out of the fishermen interviewed; 8 reported being finished with kings also saying that the run was good and plentiful this year and are happy with their harvests, and 7 reported that although the run is better this week, the kings are becoming smaller in size due to being later in the run.

Chum:

Chums are expected to pick up next week as most fishermen will be switching to smaller mesh sizes to reach their chum goals.

Sockeye:

Sockeye are expected to pick up next week, as most fishermen will be switching to smaller mesh sizes to reach their sockeye goals.

Summary:

Altogether fishermen report; most are finishing up with their king harvests and still report that the Kings are still running strong, as for chums and sockeye, they are expected to pick up this next week as fishermen make the switch from king gear to 6" or smaller mesh. 12 reported that fishing is a lot easier due to the lifting of the closures.

Appendix B4.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, June 28, 2004.

Fishing ending the week of June 26, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
43	31	0	0	8	26

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
19	12	0	24	7	0	5	22	4	0	0	0

Chinook:

Out of the fishermen interviewed; 24 reported being finished with kings also saying that the run was good and plentiful this year and are happy with their harvests, also most report that although the run is slowing down this week the kings are still coming in large in size with more females present.

Chum:

Chums are coming in plentiful this week as fishermen report reaching their harvest goals with no complaints.

Sockeye:

Fishermen report that the run is better this year than the past couple years, and expect that the sockeye will pick up more by the start of this week.

Summary:

Altogether fishermen report, most are finishing up with their king harvests and are pleased with their catches and sizes of fish this year. For chums and sockeye, the majority of fishermen have switched gear to reach their harvest goals and plan on finishing up their harvests before the blue flies become too many to dry fish. It was also noted by 2 women in cutting and hanging that they have not seen so many large kings on average in the last 20 years. Twenty-eight mentioned person very thankful for the news that the subsistence fishing closures were lifted.

Appendix B5.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, July 06, 2004.

Fishing ending the week of July 03, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
45	17	0	5	2	17

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
3	17	0	10	10	0	0	13	7	0	0	0

Chinook:

Out of the fishermen interviewed; all reported being finished with kings also saying that the run was very good and plentiful this year and are happy with their harvests, also most report that although the run is slowing down this week the kings are still coming in but most are red in color. Five families reported rod and reeling this week and were very excited about the amount of kings up the Kwethluk River.

Chum:

Chums are coming in plentiful this week as fishermen report reaching their harvest goals with no complaints.

Sockeye:

Fishermen report that the run is better this year than the past couple years.

Summary:

Altogether fishermen report, all are finished with their king harvests and are pleased with their catches and sizes of fish this year. For chums and sockeye, the majority of fishermen have switched gear to reach their harvest goals and plan on finishing up their harvests before the blue flies become too many to dry fish. Twelve families reported that next week they would be checking on the salmon berries while waiting for Coho salmon.

Appendix B6.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, July 12, 2004.

Fishing ending the week of July 10, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
44	10	0	3	0	10

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	10	0	8	2	0	0	4	6	0	0	0

Chinook:

Out of the fishermen interviewed; all reported being finished with kings also saying that the run was very good and plentiful this year and are happy with their harvests. Three families reported rod & reeling this week and were very excited about the amount of kings up the Kwethluk River.

Chum:

The chum run overall this season is very good and still running strong. There are still a few people that will be fishing for chums after they are done berry picking.

Sockeye:

The sockeye run overall was ok this year as families reached their harvest goals and are pleased with what they caught.

Summary:

Altogether fishermen report, all are finished with their king harvests and are pleased with their catches and sizes of fish this year. For chums and sockeye, the majority of fishermen reached their harvest goals and concentrate on putting their finished smoked fish away. For the next couple weeks most families will be focusing on berry picking while they wait for the silvers to come.

Appendix B7.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, July 19, 2004.

Fishing ending the week of July 17, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
35	4	1	1	0	5

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	6	0	0	6	0	0	6	0	0	6	0

Chinook:

Of the fishermen interviewed, all reported being finished with kings and are very happy about the run this year, in both fish numbers and size.

Chum:

Fisherman observed that the chum run overall this season was very good and is now winding down.

Sockeye:

The sockeye run overall was ok this year as most families interviewed reached their harvest goals and are pleased with what they caught.

Coho:

One fisherman did consider that the run appeared to be coming early this year.

Summary:

All fishermen interviewed are finished with their king harvests and are pleased with their catches for the year. For chums and sockeye, the majority of fishermen reached their harvest goals and have put their finished smoked fish away. For those still fishing, though their actual catches are "poor", they note that is to be expected and is normal for this time of year.

Appendix B8.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, July 26, 2004.

Fishing ending the week of July 24, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
46	4	2	2	0	6

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	0	0	0	0	0	0	0	0	0	8	0

Chinook:

All families report being finished with fishing for kings this year.

Chum:

All families report being finished with fishing for chums this year.

Sockeye:

All families report being finished with fishing for sockeyes this year.

Coho:

No additional comments.

Summary:

All of the families interviewed are finished with their king, sockeye and chum harvests. Most subsistence fishermen are still concentrating their efforts on berry picking. Six of the fishermen interviewed reported the cohos are beginning to pick up, but most interviewed said they will wait for the first or second week of August. The two fishermen using rod and reel reported catching mostly all chums.

Appendix B9.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, August 2, 2004.

Fishing ending the week of July 31, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
47	5	1	1	0	6

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	0	0	0	0	0	0	0	0	7	0	0

Chinook:

All families report being finished with fishing for kings this year.

Chum:

All families report being finished with fishing for chums this year.

Sockeye:

All families report being finished with fishing for sockeyes this year.

Coho:

The majority of fishermen report that the run for cohos is going good so far. Most families report that they are finishing up with their coho harvests and include that the run is going good. One elder reported setting a whitefish net and catching all the silvers he needed for the winter in just one night.

Summary:

All families interviewed are finished with their king, sockeye and chum harvests. Most subsistence fishermen are still concentrating their efforts on berry picking. There is also the Russian Orthodox Conference going on in Napaskiak this week that most families are attending. Six of the fishermen interviewed reported the cohos are beginning to pick up, but most said they will wait for the first or second week of August. The family using rod and reel reported catching mostly chums.

Appendix B10.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, August 9, 2004.

Fishing ending the week of August 7, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
58	13	0	9	0	13

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	0	0	0	0	0	0	0	0	19	3	0

Chinook:

All families report being finished with fishing for kings this year.

Chum:

All families report being finished with fishing for chums this year.

Sockeye:

All families report being finished with fishing for sockeyes this year.

Coho:

The majority of fishermen report that the run for cohos is going good so far. Most families report that they will be finishing up with their harvests for coho next week. The fishermen fishing with rod and reels all reported that the silvers are starting to hit and expect that it will get a little better through the end of this week. Six fishermen reported that commercial fishing periods were presenting them some difficulty in planning when to fish, but that it was not a hardship in achieving their harvest needs, just being uncertain as to the specific times of closure.

Summary:

All families interviewed are finished with their king, sockeye and chum harvests. A few families so far have finished harvesting their silvers for the year and also report that they will go rod and reeling before the coho pass. Most subsistence fishermen are still concentrating their efforts on berry picking. Eight of the fishermen interviewed reported the cohos are beginning to pick up, but most said they would wait for the second week of August.

Appendix B11.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, August 16, 2004.

Fishing ending the week of August 14, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
44	13	1	3	0	13

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	0	0	0	0	0	0	0	0	16	0	0

Chinook:

All families report being finished with fishing for kings this year.

Chum:

All families report being finished with fishing for chums this year.

Sockeye:

All families report being finished with fishing for sockeyes this year.

Coho:

The majority of fishermen report that the run for cohos is going good so far with the help of the strong sough wind the past few days. The fishermen fishing with rod and reels all reported that the silvers are running very strong and expect that it will get a little better through the end of this week. Five subsistence fishermen will still fish for their dog teams next week. Six families will wait till next week to finish their harvest goals for the season.

Summary:

All families interviewed are finished with their king, sockeye and chum harvests. A few more families this week have finished harvesting their silvers for the year and also report that they will go rod and reeling before the Coho pass. Some families are still concentrating their efforts on berry picking.

Appendix B12.–Kuskokwim River inseason subsistence salmon harvest weekly report, Orutsararmiut Native Council, August 23, 2004.

Fishing ending the week of August 21, 2004.

Families Surveyed	Using Driftnets	Using Setnets	Rod and Reel	Gillnets more than 6" mesh	Gillnets less than 6" mesh
52	6	0	2	0	6

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

Chinook			Chum			Sockeye			Coho		
Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
0	0	0	0	0	0	0	0	0	8	0	0

Chinook:

All families report being finished with fishing for kings this year.

Chum:

All families report being finished with fishing for chums this year.

Sockeye:

All families report being finished with fishing for sockeyes this year.

Coho:

The majority of fishermen report that the run for cohos is going good as they reach their harvest goals for the silver run with no worries. The fishermen fishing with rod and reels all reported that the silvers are still running good.

Summary:

All families interviewed are finished with their king, sockeye and chum harvests. A few more families this week have finished harvesting their silvers for the year and also report that they will go rod and reeling before the Coho pass. Some families are still concentrating their efforts on berry picking.

APPENDIX C. KUSKOKWIM RIVER INSEASON SUBSISTENCE SALMON SUMMARY OF FISHING REPORTS

Appendix C1.–Kuskokwim River subsistence summary report, summary of salmon fishing, 2003.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]															
	Number of Families			Chinook salmon			Chum salmon			Sockeye salmon			Coho salmon		
Week ending	Interviewed	Fishing	Not Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 07	18	9	9	7	2	0									
Jun 14	33	24	9	22	2	0	0	2	0	0	3	0			
Jun 21	48	32	14	30	2	1	1	0	0	7	18	3			
Jun 28	50	34	16	30	4	0	3	9	13	27	7	0			
Jul 05	45	21	24	16	5	0	8	13	0	16	5	0			
Jul 12	46	14	32	0	12	2	13	1	0	0	12	2			
Jul 19	48	5	43	0	5	0	5	0	0	0	5	0	2	3	0
Jul 26	48	7	41	0	7	0	4	3	0	0	7	0	6	1	0
Aug 09	49	11	38	0	0	0	0	0	0	0	0	0	10	1	0
Aug 16	48	10	38	0	0	0	0	0	0	0	0	0	9	1	0
Total [b]	433														
Average	43	17	26	11	4	0	4	3	1	6	6	1	7	2	0

[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Appendix C2.–Kuskokwim River Chinook and chum salmon subsistence summary, quality of fishing report, 2003.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]									
	Number			% Describing Chinook fishing as			% Describing Chum fishing as		
Week ending	Interviewed	Fishing	Percent Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 07	18	9	50%	78%	22%	0%			
Jun 14	33	24	73%	92%	8%	0%	0%	8%	0%
Jun 21	48	34	71%	88%	6%	3%	3%	0%	0%
Jun 28	50	34	68%	88%	12%	0%	9%	26%	38%
Jul 05	45	21	47%	76%	24%	0%	38%	62%	0%
Jul 12	46	14	30%	0%	86%	14%	93%	7%	0%
Jul 19	48	5	10%	0%	100%	0%	100%	0%	0%
Jul 26	48	7	15%	0%	100%	0%	57%	43%	0%
Aug 09	49	11	22%						
Aug 16	48	10	21%						
Total [b]	433								
Average	43	17							

[a] Represents responses from the question “Compared with this time in a “Normal” year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Appendix C3.–Kuskokwim River sockeye and coho salmon subsistence summary, quality of fishing report, 2003.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]									
Week ending	Number		Percent Fishing	% Describing Sockeye fishing as			% Describing Coho fishing as		
	Interviewed	Fishing		Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 07	18	9	50%						
Jun 14	33	24	73%	0%	13%	0%			
Jun 21	48	34	71%	21%	53%	9%			
Jun 28	50	34	68%	79%	21%	0%			
Jul 05	45	21	47%	76%	24%	0%			
Jul 12	46	14	30%	0%	86%	14%			
Jul 19	48	5	10%	0%	100%	0%	40%	60%	0%
Jul 26	48	7	15%	0%	100%	0%	86%	14%	0%
Aug 09	49	11	22%				91%	9%	0%
Aug 16	48	10	21%				90%	10%	0%
Total [b]	433								
Average	43	17							

[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Appendix C4.–Kuskokwim River subsistence salmon summary, quality of fishing report, 2002.

Summary of Subsistence Salmon Information Collected by ONC Technicians[a]															
	Number of Families			Chinook salmon			Chum salmon			Sockeye salmon			Coho salmon		
Week ending	Interviewed	Fishing	Not Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 15	27	23	4	21	2	0	3	8	7	3	11	3			
Jun 22	33	25	8	17	5	3	12	9	3	2	10	10			
Jun 29	34	22	12	16	6	0	21	0	0	0	3	16			
Jul 06	34	5	29	0	2	3	3	2	0	0	0	5			
Jul 13	36	10	26	0	3	5	8	0	0	0	0	8	0	0	0
Jul 20	40	9	31	0	9	0	1	7	1	0	0	9	0	0	0
Jul 27	35	31	4	0	31	0	0	31	0	0	31	0	9	22	0
Aug 03	37	13	24	0	0	0	0	10	2	0	0	0	9	4	0
Aug 10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total[b]	276														
Average	35	17	17	7	7	1	6	8	2	1	7	6	5	7	0

[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Note: ND = No data.

Appendix C5.–Kuskokwim River Chinook and chum salmon subsistence summary, quality of fishing report, 2002.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]									
Week	Number		Percent	% Describing Chinook fishing as			% Describing Chum fishing as		
ending	Interviewed	Fishing	Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 15	27	23	85%	91%	9%	0%	13%	35%	30%
Jun 22	33	25	76%	68%	20%	12%	48%	36%	12%
Jun 29	34	22	65%	73%	27%	0%	95%	0%	0%
Jul 06	34	5	15%	0%	40%	60%	60%	40%	0%
Jul 13	36	10	28%	0%	30%	50%	80%	0%	0%
Jul 20	40	9	23%	0%	100%	0%	11%	78%	11%
Jul 27	35	31	89%	0%	100%	0%	0%	100%	0%
Aug 03	37	13	35%	0%	0%	0%	0%	77%	15%
Aug 10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total [b]	276								
Average	35	17							

[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Note: ND = No data.

Appendix C6.–Kuskokwim River sockeye and coho salmon subsistence summary, quality of fishing report, 2002.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]									
Week	Number		Percent	% Describing Sockeye fishing as			% Describing Coho fishing as		
ending	Interviewed	Fishing	Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 15	27	23	85%	13%	48%	13%			
Jun 22	33	25	76%	8%	40%	40%			
Jun 29	34	22	65%	0%	14%	73%			
Jul 06	34	5	15%	0%	0%	100%			
Jul 13	36	10	28%	0%	0%	80%	0%	0%	0%
Jul 20	40	9	23%	0%	0%	100%	0%	0%	0%
Jul 27	35	31	89%	0%	100%	0%	29%	71%	0%
Aug 03	37	13	35%				69%	31%	0%
Aug 10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total [b]	276								
Average	35	17							

[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Note: ND = No data.

Appendix C7.–Kuskokwim River subsistence summary report, summary of salmon fishing, 2001.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]															
	Number of Families			Chinook salmon			Chum salmon			Sockeye salmon			Coho salmon		
Week ending	Interviewed	Fishing	Not Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 09	16	16	0	6	6	4									
Jun 16	39	ND	ND	18	15	6	1	19	15	13	24	1			
Jun 23	35	ND	ND	27	7	1	0	15	20	24	11	0	0	0	0
Jun 30	40	25	15	8	7	8	5	12	8	19	6	0	0	0	0
Jul 07	44	7	37	0	1	5	5	1	1	0	5	2	0	0	0
Jul 14	44	6	38	0	0	4	4	2	0	0	0	4	0	0	0
Jul 21	44	0	44	0	0	0	0	0	0	0	0	0	0	0	0
Jul 28	44	9	35	0	0	0	1	7	0	0	0	0	0	7	1
Aug 04	42	20	22				0	1	17				18	2	0
Aug 11	37	3	34				0	0	0				2	1	0
Aug 18	37	3	34				0	0	3				1	2	0
Aug 25	37	3	34				0	0	3				3	0	0
Total [b]	459														
Average	38	9	29	7	5	4	1	5	6	8	7	1	2	1	0

[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Note: ND = No data.

Appendix C8.–Kuskokwim River Chinook and chum salmon subsistence summary, quality of fishing report, 2001.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]									
Week	Number		Percent	% Describing Chinook fishing as			% Describing Chum fishing as		
ending	Interviewed	Fishing	Fishing	Very Good	Normal	Poor	Very Good	Normal	Poor
Jun 09	16	16	100%	38%	38%	38%			
Jun 16	39	ND	ND	ND	ND	ND	ND	ND	ND
Jun 23	35	ND	ND	ND	ND	ND	ND	ND	ND
Jun 30	40	25	63%	32%	28%	28%	20%	48%	32%
Jul 07	44	7	16%	0%	14%	14%	71%	14%	14%
Jul 14	44	6	14%	0%	0%	0%	67%	33%	0%
Jul 21	44	0	0%	ND	ND	ND	ND	ND	ND
Jul 28	44	9	20%	0%	0	0	11%	78%	0%
Aug 04	42	20	48%				0%	5%	85%
Aug 11	37	3	8%				0%	0%	0%
Aug 18	37	3	8%				0%	0%	100%
Aug 25	37	3	8%				0%	0%	100%
Total [b]	459								
Average	38	9							

[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Note: ND = No data.

Appendix C 9.–Kuskokwim River sockeye and coho salmon subsistence summary, quality of fishing report, 2001.

Summary of Subsistence Salmon Information Collected by ONC Technicians [a]									
Week	Number		Percent	% Describing Sockeye fishing as			% Describing Coho fishing as		
ending	Interviewed	Fishing	Fishing	Very Good	Average	Poor	Very Good	Average	Poor
Jun 09	16	16	100%						
Jun 16	39	ND	ND	ND	ND	ND	ND	ND	ND
Jun 23	35	ND	ND	ND	ND	ND	ND	ND	ND
Jun 30	40	25	63%	76%	24%	0%	0%	0%	0%
Jul 07	44	7	16%	0%	71%	29%	0%	0%	0%
Jul 14	44	6	14%	0%	0%	67%	0%	0%	0%
Jul 21	44	0	0%	ND	ND	ND	ND	ND	ND
Jul 28	44	9	20%				0%	78%	11%
Aug 04	42	20	48%				90%	10%	0%
Aug 11	37	3	8%				67%	33%	0%
Aug 18	37	3	8%				33%	67%	0%
Aug 25	37	3	8%				100%	0%	0%
Total [b]	459								
Average	38	9							

[a] Represents responses from the question "Compared with this time in a "Normal" year how were catch rates for salmon this week?"

[b] Represents the total number of interviews conducted during the survey year, most families were interviewed more than once.

Note: ND = No data.