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Aniak Area Post-Season Subsistence Fishery Harvest Household Surveys

Final Report No. FIS 02-036

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FINAL REPORT SUMMARY PAGE

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- 9. Abstract:** The Alaska Department of Fish and Game Subsistence Division, in partnership with the Kuskokwim Native Association, directed household surveys in Aniak during October-November 2002 to collect subsistence fish harvest data for the previous period of March 1, 2002 through September 30, 2002. The survey identified households that subsistence fished; estimated the number of salmon and non-salmon fish harvested for subsistence; identified gear used for each species harvested along with harvest locations for hook and line; and documented household perceptions of subsistence salmon fishing quality.
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ABSTRACT

Information describing subsistence harvest levels for non-salmon species in the Kuskokwim River drainage is limited. In particular, there have been no studies that quantify the subsistence harvest of non-salmon species in the middle Kuskokwim Management Area. Since 1988, the Alaska Department of Fish and Game Subsistence Division has conducted annual household surveys each October-November to collect data on subsistence salmon harvests. Information about the number and species of salmon harvested by community households in the middle Kuskokwim Area has been obtained primarily through these household surveys, as well as with harvest calendars and postcard surveys. Aniak is the largest community in the middle Kuskokwim Area and the largest community served by the Kuskokwim Native Association. The Alaska Department of Fish and Game Subsistence Division, therefore, partnered with the Kuskokwim Native Association to conduct subsistence fish harvest surveys uniquely for the Aniak area. Subsistence fish harvest household surveys were conducted in the community of Aniak during October-November 2002 to document the harvest period of seven months from March 1, 2002, through September 30, 2002.

The purpose of the Aniak subsistence fish harvest household survey was to identify households that participated in the subsistence fishery, to estimate the number of salmon and non-salmon resident fish harvested by the community for subsistence from March 1 to October 1, 2002, and to identify both the gear used for subsistence fishing as well as the harvest areas where hook and line gear was used for each species harvested. Households were also surveyed as to their perceived quality of subsistence salmon fishing for the 2002 season. A secondary intent of this project, in extending responsibility for conducting post-season surveys to the Kuskokwim Native Association, was to assist the Association in developing skills and capacity to continue with this project in the future, and perhaps to expand its involvement to other communities in the mid-Kuskokwim region.

The Aniak Area Post-Season Subsistence Fishery Harvest Household Surveys project initiated partnership between the Alaska Department of Fish and Game Subsistence Division and the Kuskokwim Native Association to foster community-based coordination of fish harvest household surveys by the Association, and to implement proposed objectives of data collection. Results of the project have contributed to a more comprehensive analysis of Aniak area subsistence activities than has been provided previously in regionwide Kuskokwim Management Area post-season household fish harvest surveys.

INTRODUCTION

During October and November 2002, the Alaska Department of Fish and Game Subsistence Division (ADF&G/SD) in partnership with the Kuskokwim Native Association (KNA) conducted post-season subsistence fish harvest surveys of households in the community of Aniak for the harvest period of March 1, 2002, through September 30, 2002. Aniak, with over 550 residents, is the largest community in the middle Kuskokwim Management Area (Figure 1) and the largest community served by the Kuskokwim Native Association. The purpose of the survey was to gather information from Aniak households about their harvest of fish, to identify households that participated in the subsistence fishery, estimate the number of salmon and non-salmon resident fish harvested by the community for subsistence from March 1-October 1, 2002, and to identify gear used for subsistence fishing as well as the harvest areas where hook and line gear was used for each species harvested. Households also were surveyed as to their perceived quality of subsistence salmon fishing for the 2002 season. The results of those survey efforts are included in this report.

Fish, and particularly salmon, have historically represented a significant portion of the overall subsistence harvest in the Kuskokwim region. Presently, there are no requirements that subsistence fishers report their harvest to the Department of Fish and Game, and subsistence fishing permits or licenses are not required in the Kuskokwim Area. To estimate subsistence harvest, the Division of Subsistence conducts annual household harvest surveys in most villages in the Kuskokwim Management Area. Information on the amount of salmon harvested annually in the Kuskokwim Area is obtained through voluntary participation by communities in post-season harvest surveys, as well as through the recording of catches on harvest calendars mailed to all interested households. For non-salmon species, information describing harvest levels in the Kuskokwim River drainage has been limited. While a few studies have quantified harvest levels in the lower Kuskokwim region (Andrews 1989, Coffing 1991, 2000, 2001), there have been no previous studies to quantify the harvest of non-salmon species in the middle Kuskokwim Area.

Residents of Aniak harvest several species of salmon and freshwater fish for subsistence use. Salmon and other subsistence fish are harvested in several areas in the vicinity of Aniak, within the Yukon Delta National Wildlife Refuge. Nearly all of the salmon harvested are caught directly from the Kuskokwim River while other species are harvested from a variety of locations at different times of the year. Information about the number and species of salmon harvested by Aniak residents is obtained primarily through household surveys, harvest calendars and postcard surveys. From 1988 until the time of this project in 2002, surveys designed to collect data on salmon harvests had been conducted during October-November by staff of the Department of Fish and Game without direct involvement of the Kuskokwim Native Association.

One focus of this project was to share responsibility for conducting post-season surveys with the Kuskokwim Native Association, with the intent of assisting the Association to develop skills and the capacity to continue with this project in the future, and perhaps to expand their involvement to other communities in the Middle Kuskokwim River region. The research instrument used in this Aniak Area Post-Season Fish Harvest Household Survey (see Appendix A) was similar to

Figure 1. Map of Kuskokwim Management Area



that employed for conducting the post-season salmon harvest surveys in the Bethel area during the fall of 2000 (Coffing 2001). The Division of Subsistence provided data entry and analysis.

For communities in the Kuskokwim Management Area, house-to-house surveys have been shown to be the most effective method for obtaining data on harvest and use of subsistence fish. In-person household surveys consistently have been more successful in gathering subsistence salmon harvest estimates than have been other formalized means, such as the harvest calendars or postcards. This survey effort represented a continuation of the house-to-house method.

OBJECTIVES

This project had four primary objectives, as follows:

1. Determine the total number of households in Aniak in 2002 and of these, identify the number of households that harvested salmon and/or other freshwater fish species in the Kuskokwim Area.
2. Estimate the number of chinook, coho, sockeye, chum, and pink salmon, as well as the number of resident fish species, harvested for subsistence use by the community of Aniak during the seven-month period of March 1-October 1, 2002.
3. Identify the types of salmon fishing gear used by Aniak residents for harvests during the 2002 salmon season on the Kuskokwim River.
4. Identify harvest locations used when fishing with hook and line gear through the ice and also in open water.

METHODS

Methods used for carrying out this work followed procedures established by the Division of Subsistence, Alaska Department of Fish and Game, to conduct subsistence salmon harvest surveys in communities throughout the Kuskokwim Management Area (Coffing, 2003; Coffing and Walker, 1989). The Kuskokwim Native Association trained community survey staff on maintaining and providing timesheets for the hours worked and conditions of employment. KNA also provided survey staff with necessary timesheets and planning calendars to identify dates when timesheets were to be turned in to KNA for payment.

The Division of Subsistence maintains a list of names and contact information for all households in the Kuskokwim Management Area that is updated for each community annually during household surveys. In addition to household surveys, harvest data are collected for salmon using

harvest calendars and postcard surveys. Beginning in mid-May of 2002, harvest calendars were sent to all fishers who fished during the 2001 fishing season or were known to have fished for salmon in the three years prior to the 2002 season. The calendars provide a means for households to record their daily harvest of salmon, giving only harvest numbers for each species. Households are asked to mail the completed harvest calendar to the Division, although most calendars are collected by the survey technicians conducting post-season household surveys. Postcard surveys are a method for obtaining harvest data from households that were not contacted during the household survey visits.

Household Identification

Kuskokwim Native Association staff members assisted in identifying household locations and physical addresses for those fishers listed by ADF&G/SD to be surveyed. KNA personnel conducted interviews of interested applicants in late September 2002. Survey technicians hired to work on the project were familiarized with the project and thoroughly trained on the appropriate application of the survey instrument by Division of Subsistence staff before starting the surveys.

ADF&G/SD provided orientation and training to the technicians and the Natural Resources Director on October 7, 2002, and household surveys began immediately following this training. KNA survey technicians reported their work progress and turned in survey forms to the KNA Natural Resources Director for review and tally, and the Natural Resources Director was responsible for keeping the survey crew on schedule. KNA provided transportation as needed.

All of the estimated 165 households in the community of Aniak were invited to participate in the harvest survey. The survey was designed as a household census and efforts were made to contact every occupied housing unit in Aniak.

ADF&G provided the necessary survey forms and periodically reviewed the completed forms for completeness, legibility, and any errors that may have occurred. The completed survey forms were entered into a computer database. Summary statistics for the community of Aniak were incorporated into a larger database containing subsistence salmon harvest data for the remainder of the Kuskokwim Management Area. These findings were summarized in a draft Subsistence Salmon Fishery component for inclusion in the Annual Management Report for the Subsistence and Commercial Fisheries of the Kuskokwim Area, 2002 (Appendix B). The household mailing list for Aniak was retained by ADF&G/SD to support future household harvest survey work.

Assessment of Harvests, Gear, and Harvest Locations

The primary harvest data collection method for this project was systematic in-person household surveys. In addition to the harvest and use data, surveys also collected limited demographic information to support analysis of the data, as well as information on the sharing and use of fish species, timing of harvest, and numbers and species harvested. Based on retrospective recall,

respondents were asked to provide specific information on numbers and species harvested (see Appendix A for a copy of the survey instrument).

Households that were not available to be surveyed were provided with a postage-paid postcard survey to complete. The postcard survey asked whether the household had harvested salmon during the study year; the number of salmon for each species harvested; the type of gear used; and whether subsistence salmon fishing was good, average, or poor during the season. Similar data were collected for resident, non-salmon species. Data from returned postal surveys were added to the body of household subsistence salmon harvest information gathered for the project.

Harvest and use data were collected for the subsistence fish harvest time period of March 1, 2002 through September 30, 2002, in locally conducted interviews between the local research technician and a household representative. Data were collected beginning in early October and continuing through November of 2002. The KNA Natural Resources Director in Aniak was available to both research technicians and community members to answer questions or provide additional information on survey implementation.

RESULTS

All of the occupied housing units in Aniak, a total of 165 households, were identified with a physical address and added to the ADF&G/SD database in Bethel. A correct listing of household addresses will assist the Bethel ADF&G/SD office in conducting future post-season household subsistence salmon harvest surveys. In-person surveys were successfully completed at 163 of the 165 Aniak household units, representing a participation rate of 98.8%. Because the residents of some units were not at home on the initial visit, staff went to some households at least three times during the course of their survey efforts. On the third visit, if the residents were still not at home, a postcard survey was left at the house. The two remaining households in Aniak were mailed a harvest survey postcard.

Participation in Subsistence Fishing

A total of 120 households reported harvesting fish (salmon or other species) during the study period. Household participation rates in subsistence fishing activities were highest for the various salmon species (Table 2). A total of 86 households reported fishing for chinook salmon; 97 households reported fishing for coho salmon harvests, 56 for chum, and 51 for sockeye salmon. Only four households reported harvesting pink salmon. Of non-salmon species, whitefish, sheefish, and northern pike each were reported as being harvested by 15%-18% percent of households, with whitefish representing the preponderance of the non-salmon catch overall. Approximately 9%-12% of households reported harvests of grayling, Dolly Varden, and rainbow trout, with 85%-92% of the fish harvested with rod and reel gear type. Nearly 4% of households reported harvesting burbot, 90% of which were harvested with gear other than nets or rod and

reel, presumably fish traps. Relatively few households reported harvesting lake trout, and no households reported harvesting blackfish.

Harvest Amounts

Based on the 163 Aniak households surveyed, total community estimates were made of the amount of each fish species harvested for subsistence use during the study period (Table 1). An estimated 9,379 salmon and 3,938 non-salmon fish (excluding blackfish and smelt) were harvested. Chinook salmon represented 31.9 percent of the total number of salmon harvested; coho salmon equaled 27.9 percent, sockeye 7.7 percent, and chum 32.0 percent. Whitefish comprised the majority of non-salmon species harvested, representing 79% of the total non-salmon harvest (excluding smelt). Sheefish and northern pike represented 5% and 6% respectively of the total non-salmon harvest (excluding smelt) in numbers of fish (Table 2). Approximately 30 gallons of smelt were harvested by a total of three households.

Table 1. Aniak Post-Season Subsistence Fishery Harvest Household Surveys, 2002

Species	REPORTED		ESTIMATED	
	Number of Households Fished	Number of Fish Harvested ¹	Number of Households Fished	Number of Fish Harvested
Chinook salmon	84	2,782	86	2,994
Chum salmon	55	2,946	56	3,002
Sockeye salmon	50	710	51	723
Coho salmon	95	2,510	97	2,616
Pink salmon	4	43	4	44
Northern Pike	29	183	30	186
Burbot	6	77	6	79
Whitefish	25	3,037	26	3,109
Sheefish	24	226	25	232
Grayling	15	108	15	110
Dolly Varden	17	144	17	147
Rainbow Trout	20	70	20	71
Lake Trout	1	4	1	4
Blackfish	0	0	0	0
Smelt	3	29	3	30

SOURCE: Alaska Department of Fish and Game, Division of Subsistence and Kuskokwim Native Association, Household Surveys, 2002.

¹Blackfish and Smelt measured in gallons of fish.

Table 2. Estimated Numbers of Subsistence Fish Harvested by Gear Type, 2002

Species	Households*		Number of Fish Harvested for Subsistence**						
	#	%	Set Net	Drift Net	Net Under Ice	Other Gear	Hooking Through Ice	Rod and Reel	TOTAL
Chinook	86	52.0%	591	2,252		0		151	2,994
Chum	56	34.0%	518	2,096		183		205	3,002
Sockeye	51	31.0%	110	505		56		52	723
Coho	97	58.7%	150	1,084		390		991	2,616
Pink	4	2.5%	0	0		10		34	44
TOTAL SALMON			1,369	5,937		639		1,433	9,379
Northern Pike	30	17.9%	61	0	0	2	13	110	186
Burbot	6	3.7%	0	0	0	72	0	7	79
Whitefish	26	15.5%	442	9	0	2,560	5	93	3,109
Sheefish	25	14.9%	115	86	0	0	0	31	232
Grayling	15	9.3%	0	0	0	4	5	101	110
Dolly Varden	17	10.5%	0	0	0	10	3	134	147
Rainbow Trout	20	12.4%	0	0	0	1	10	60	71
Lake Trout	1	0.6%	0	0	0	0	0	4	4
TOTAL NON-SALMON			618	95	0	2,649	36	540	3,938
TOTAL FISH BY GEAR TYPE			1,987	6,032	0	3,288	36	1,973	13,317

Blackfish	Households		Trap (Gallons)
	#	%	
	0	0.0%	0.0
Smelt	Households		Dipnet (Gallons)
	#	%	
	3	1.9%	30.0

* Household number and percentage estimates expanded from household surveys only.

** Salmon harvest estimates from all sources reallocated to gear types according to survey distribution.

NOTE: Salmon harvest data are for summer 2002. Data for other species is from 1 October 2001 to 30 September 2002.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence and Kuskokwim Native Association, Household Surveys, 2002.

Harvest Gear

The majority of the salmon harvested, 63.3 percent, were caught with drift gillnets (Table 2). Set gillnets were used to harvest approximately 14.6 percent of the salmon caught. Large mesh gear continues to be used by a majority of subsistence fishers targeting chinook salmon. A total of 62 households provided information on the mesh size of gillnets used when harvesting chinook salmon. Sixty-six percent (41 households) reported using gill nets having 8-inch or greater mesh size. An estimated 1,433 salmon were harvested with hook and line gear. Most (69 percent) of the salmon harvested with hook and line gear were coho salmon. A total of 991 coho, 151 chinook, 52 sockeye, 205 chum and 34 pink salmon were harvested with hook and line gear.

In contrast to salmon, drift gillnets were used to harvest only two percent of non-salmon species. Approximately 14 percent of the non-salmon fish were harvested with rod and reel gear and 16 percent with set gillnet in open water. Smelt were harvested exclusively with dip nets. As noted previously, whitefish represented the largest percentage of non-salmon fish harvested, primarily through the use of fish wheels or fish traps.

Sheefish was the predominant non-salmon species harvested with drift gillnets. Set nets used during periods of open water were used primarily for harvesting whitefish, although sheefish and northern pike also were harvested in set gillnets. Few households reported fishing with hook and line gear through the ice, although for those reporting using that gear type, northern pike and rainbow trout were the primary species harvested. Subsistence harvests with hook and line gear in open water (rod and reel, Table 2) included an estimated 134 Dolly Varden, 110 northern pike, 101 grayling, 93 whitefish, 60 rainbow trout, and 31 sheefish.

Hook and Line Harvest Locations

Harvest location information was asked of households that used subsistence hook and line gear to catch fish. Hook and line gear includes both rod and reel used in open water and hooking through ice during winter months. Harvest location information was not asked of fish caught with other gear. The primary reason for collecting this information was to establish a baseline data set for subsistence rod-and-reel harvest of salmon and resident species in the Aniak River drainage. Local subsistence fishers have cited low resident species production and poor salmon returns as evidence the Aniak River area is being overfished by sport fishers. These user conflicts between subsistence fishers and non-local rod-and-reel sport fishers are addressed in two other FIS studies, FIS 01-014 "Survey of the Rod-and-Reel Fisheries in the Aniak River, Alaska, 2001" and FIS 01-112 "Aniak River Subsistence fisheries Study," which have researched this conflict in more detail. Results from FIS 01-014 can be found in ADF&G Fishery Data Series Report No. 02-16 "Survey of the Rod-and-Reel Fisheries in the Aniak River, Alaska, 2001." Results from FIS 01-112 will be summarized in the Final report for that project, expected September 2004.

Aniak residents focused much of their summer rod and reel fishing efforts on the Aniak River and the beach in front of Aniak, which borders the Kuskokwim River. The primary winter harvest areas used by subsistence fishers hooking through ice included Pike Lake and Doestock Creek (Table 3).

Table 3. Harvest Locations of Fish Caught with Subsistence Hook and Line Gear, 2002

Species	Harvest Location	Estimated Number of Fish Harvested by Gear Type	
		Rod and Reel	Hooking Through Ice
Chinook Salmon	Kuskokwim River	7	-
Chinook Salmon	Aniak River	41	-
Chinook Salmon	Beach in front of Aniak	49	-
Chinook Salmon	Owhat River	1	-
Chum Salmon	Kuskokwim River	8	-
Chum Salmon	Aniak River	14	-
Chum Salmon	Beach in front of Aniak	113	-
Chum Salmon	George River	3	-
Sockeye Salmon	Kuskokwim River	1	-
Sockeye Salmon	Aniak River	1	-
Sockeye Salmon	Beach in front of Aniak	36	-
Coho Salmon	Kuskokwim River	60	-
Coho Salmon	Aniak River	214	-
Coho Salmon	Beach in front of Aniak	592	-
Coho Salmon	George River	5	-
Coho Salmon	Owhat River	20	-
Coho Salmon	Aniak Slough	7	-
Coho Salmon	Kuskokwim River: upstream of Chuathbaluk	7	-
Coho Salmon	Holokuk River	4	-
Pink Salmon	Beach in front of Aniak	34	-
Northern Pike	Kuskokwim River: Lower Kalskag to Aniak	4	-
Northern Pike	Kuskokwim River: Aniak to Chuathbaluk	3	-
Northern Pike	Aniak Slough	29	-
Northern Pike	Pike Lake	-	12
Northern Pike	Mouth of Aniak River	2	-
Northern Pike	Aniak River: Below Doestock Creek	52	-
Northern Pike	Doestock Creek	-	1
Northern Pike	Buckstock River	2	-
Northern Pike	Holokuk River	2	-
Northern Pike	Discovery Creek	10	-
Northern Pike	Beach in front of Aniak	3	-
Northern Pike	Johnson River	3	-
Northern Pike	Kuskokwim River: Downstream from Lower Kalskag	2	-
Burbot	Kuskokwim River: Aniak to Chuathbaluk	5	-
Whitefish	Kuskokwim River: Lower Kalskag to Aniak	5	-
Whitefish	Kuskokwim River: Aniak to Chuathbaluk	11	-
Whitefish	Whitefish Lake	43	-

Whitefish	Doestock Creek	-	5
Whitefish	Owhat River	4	-
Whitefish	Discovery Creek	10	-
Whitefish	Beach in front of Aniak	19	-
Sheefish	Kisaralik River	5	-
Sheefish	Kuskokwim River: Aniak to Chuathbaluk	1	-
Sheefish	Aniak Slough	5	-
Sheefish	Mouth of Aniak River	4	-
Sheefish	Aniak River: Below Doestock Creek	4	-
Sheefish	Owhat River	10	-
Sheefish	Beach in front of Aniak	1	-
Grayling	Holitna River	41	-
Grayling	Sue Creek	4	-
Grayling	Cheeneetnuk River	5	-
Grayling	Kuskokwim River: Aniak to Chuathbaluk	2	-
Grayling	Doestock Creek	-	5
Grayling	Aniak River: Doestock to Buckstock	5	-
Grayling	Aniak River: Buckstock to Salmon River	24	-
Grayling	Salmon River	6	-
Grayling	Owhat River	2	-
Grayling	George River	2	-
Grayling	Hokokuk River	1	-
Grayling	Discovery Creek	6	-
Grayling	Beach in front of Aniak	3	-
Dolly Varden	Holitna River	51	-
Dolly Varden	Aniak River: Below Doestock Creek	9	-
Dolly Varden	Doestock Creek	-	3
Dolly Varden	Aniak River: Doestock to Buckstock	9	-
Dolly Varden	Buckstock River	3	-
Dolly Varden	Aniak River: Buckstock to Salmon River	40	-
Dolly Varden	Salmon River	15	-
Dolly Varden	Owhat River	2	-
Dolly Varden	Hokokuk River	4	-
Rainbow Trout	Kuskokwim River: Aniak to Chuathbaluk	4	-
Rainbow Trout	Mouth of Aniak River	-	1
Rainbow Trout	Aniak River: Below Doestock Creek	18	-
Rainbow Trout	Doestock Creek	3	3
Rainbow Trout	Aniak River: Doestock to Buckstock	10	6
Rainbow Trout	Buckstock River	2	-
Rainbow Trout	Aniak River: Buckstock to Salmon River	18	-
Rainbow Trout	Salmon River	4	-
Lake Trout	Aniak Lake	4	-

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, and Kuskokwim Native Association, Household Surveys, 2003.

All species of salmon were reported as harvested primarily on the beach in front of Aniak. Also, residents reported high numbers of chinook and coho salmon harvested on the Aniak River. Coho salmon were harvested in the largest numbers of all salmon species by rod and reel, with 886 fish reported as harvested at four primary locations: 592 on the beach in front of Aniak, 214 on the Aniak River, 60 on the Kuskokwim River, and 20 on the Owhat River. By comparison, the total number of chinook harvested by rod and reel at all reported locations was 98; the total number of chum for all reported locations was 138. Virtually all sockeye and pink salmon harvests (97%) were reported as located on the beach in front of Aniak.

Nearly half (47%) of all northern pike harvested with rod and reel that were reported by location were taken on the Aniak River below Doestock Creek; 26% were harvested on the Aniak Slough. Residents located the use of hook and line gear through the ice for northern pike entirely at Pike Lake.

Forty-three percent (43%) of whitefish caught with rod and reel and reported by location were harvested at Whitefish Lake; 19% were harvested on the beach in front of Aniak. Winter harvest of whitefish was reported for Doestock Creek. Forty-one percent (41%) of grayling and 38% of Dolly Varden harvested by rod and reel were reported as located on the Holitna River. Harvest areas for other non-salmon species such as sheefish and rainbow trout are shown in Table 3.

DISCUSSION

Aniak household assessments of subsistence salmon fishing quality (Table 4) help to interpret and support the household salmon harvest numbers reported by those surveyed. Sixty-seven percent (67%) of households reported that chum fishing was very good, while 68% evaluated chinook fishing as average. Not surprisingly, the estimated total number of chinook salmon (2,994) harvested was only slightly less than the total number of chum salmon harvested (3,002), and yet the percentage of households fishing for chinook (52%) was 50% greater than the percentage of households fishing for chum (34%). The relationship of high harvest numbers reported for chinook relative to the lower number of households fishing for chum indicates potentially good return per household effort, which could be seen to support the perception of high quality chum fishing.

Sixty-one percent of households reported coho salmon fishing to have been very good and the percentage of households fishing for coho was the highest for household salmon fishing overall (59%). Coho salmon harvests during 2002 increased in the middle Kuskokwim River region 38 percent over 2001. Compared to the 1989 to 2001 average coho catch, the Aniak Area harvest was substantially higher (44 percent) (Coffing 2002).

Household evaluations of reasons for poor subsistence fishing during 2002 also correlate with subsistence fishing harvest numbers reported through this post-season household harvest survey

process (Table 5). Of all reasons given for poor chinook fishing, 54% of respondents attributed low harvests to a poor run reflected in low numbers of fish returning. As to poor sockeye subsistence fishing, 81% of respondents again indicated a poor run as the main cause, supporting survey figures showing that nearly as many households (51) fished for sockeye as for chum (56), and yet the number of sockeye salmon harvested was less than a quarter (24%) of the number of chum harvested.

Table 4. Quality of Subsistence Salmon Fishing, 2002

Species	Percentage of Households Reporting Quality of Subsistence Fishing		
	Very Good	Average	Poor
Chinook	18.6%	68.6%	12.8%
Chum	67.2%	25.9%	6.9%
Sockeye	5.5%	61.8%	32.7%
Coho	60.8%	37.1%	2.1%

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, and Kuskokwim Native Association, Household Surveys, 2002

Table 5. Reasons Given by Aniak Households for Poor Subsistence Fishing, 2002

Reason for "Poor" Quality Fishing	Number of Households Reporting Reasons for Poor Fishing				
	Chinook	Chum	Sockeye	Coho	All Salmon
Few Salmon Returned	7	2	13	2	24
Regulations	4	3	1	0	8
Personal	0	0	1	0	1
Environmental (high water, etc.)	1	0	0	0	1
Working/Busy	1	0	0	0	1
No Harvest Gear (net, boat, etc.)	0	0	1	0	1
Unknown	0	0	0	1	1
Total	13	5	16	3	37

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, and Kuskokwim Native Association, Household Surveys, 2002.

CONCLUSIONS

The Aniak Area Post-Season Subsistence Fishery Harvest Household Surveys project initiated a partnership between the ADFG/SD and KNA that was effective in implementing proposed objectives of data collection, and also fostered first-time community-based coordination of Subsistence Division fish harvest household surveys by the Kuskokwim Native Association. Results of the project have contributed to a more comprehensive analysis of Aniak area subsistence activities than has been provided previously in region wide Kuskokwim Management Area post-season harvest surveys.

KNA's ability to work within the Aniak community benefited this project beyond the association's valuable support in explaining survey objectives, training local technicians, and gathering information. The association's partnership with ADF&G/SD provided a model of cooperative research related to policy-making for other small rural communities to follow. As the largest community in the middle Kuskokwim River area, a more detailed profile of Aniak households' subsistence fishing can contribute significantly to ADF&G and community resource management activities in the overall Kuskokwim Management Area.

RECOMMENDATIONS

It is recommended that the ADFG/SD and KNA continue to cooperatively conduct annual post-season subsistence fish harvest household surveys. The volume and diversity of fine-grained data represented by these subsistence fish harvest household surveys provide opportunities for wider regional analyses and comparisons than are normally conveyed in individual project reports. Data from post-season subsistence harvest surveys can be used, for instance, to examine gear type change over time; community population trends relative to harvest changes; and the composition of harvest over time considered in relation to factors of socioeconomic and cultural change.

ACKNOWLEDGEMENTS

The authors would like to thank the community of Aniak for sharing its knowledge about these important resources. We are indebted to the elders, tribal personnel, and village residents who participated in or helped with making this project a success.

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APPENDIX A. Aniak Household Survey Form, 2002 [SIDE 1(top), SIDE 2 (bottom)]

Interviewer Initials: _____ Survey Date: Oct. Nov 6 2002 Household ID: 126
 Household Name: _____ Household PO Box Number: _____

ANIAK HOUSEHOLD SURVEY: Alaska Fish and Game Subsistence and Kuskokwim Native Association
 Household participation is voluntary, Survey forms will be turned in to Alaska Dept of Fish and Game, Subsistence. Household data will not be released without permission of Household Head.

1. Did this household catch ANY KIND OF FISH FOR SUBSISTENCE during the past year ? YES NO (if NO, the survey is done.)
 2. Did this household catch SUBSISTENCE salmon this year ? YES NO (if NO, go to back side and complete survey for other fish).

FOR SALMON FISHING HOUSEHOLDS ONLY

3. Did you use a salmon harvest calendar? YES NO (if NO then get estimates, Gear types, Rod and Reel harvest locations)
 4. Are all of the salmon you harvested on the calendar ? YES NO (if NO then get estimates of total salmon by species)
 If YES, Place a check mark for each gear type used,
 Get mesh size for Chinook, Ask for number harvested and locations for salmon caught with Rod and Reel.

SPECIES	HARVESTED Y/N	NON-COMMERCIAL USE OF SALMON, DO NOT INCLUDE SALMON THAT WERE SOLD				OTHER GEAR Write in Number gear type (of fish)	Kept From Comm Fishing (number)	HOOK AND LINE HARVESTS		KEY TO ROD AND REEL HARVEST LOCATIONS
		SET NET (number)	Mesh Size Inches	DRIFT NET (number)	Mesh Size Inches			(number)	Location	
CHINOOK SALMON King Taryaqvak	Y	8	4	0	0	0	0		A. Kuskokwim River	
CHUM SALMON Dog Iqalluk	Y	4		0	0	0	0		B. Aniak River	
SOCKEYE SALMON Red Sayak	N								C. Beach in front of Aniak	
COHO SALMON Coho, Silver Qakilyak	N								D. George River	
PINK SALMON Pink, humpy Amaqayak	N								E. Doestock (Hooking Creek)	

5. How was subsistence salmon fishing for your household this year ?
 Kings: Very Good Average Poor If poor, Why ? _____
 Chums: Very Good Average Poor If poor, Why ? _____
 Sockeye (reds) Very Good Average Poor If poor, Why ? _____
 Coho (silvers) Very Good Average Poor If poor, Why ? _____
 KUSKOKWIM AREA: ANIAK

HOUSEHOLD FISH HARVEST SURVEY: Alaska Fish and Game Subsistence and Kuskokwim Native Association
 Participation is voluntary, Survey forms will be turned in to Alaska Dept of Fish and Game, Subsistence. Household data will not be released without permission of Household Head.
 March 1, 2002 until September 30, 2002 harvest period

SPECIES	HARVESTED Y/N	DO NOT WRITE IN THE GRAY AREAS					HOOKING Thru Ice (number)	Hook and Line Open water (number)	KEY TO HARVEST LOCATIONS
		SET NET (number)	DRIFT NET (number)	NET UNDER ICE (number)	OTHER GEAR * Write in Number gear type (of fish)	Do not include fish that were released			
NORTHERN PIKE Luquayak	N								A. Kusko River L. Kalskag to Aniak
BURBOT (lush)	N								B. Kusko River Aniak to Chuathbaluk
WHITEFISH	Y	2	0	0	0	0	0		C. Whitefish Lake
SHEEFISH Ciq:	N								D. Aniak Slough
GRAYLING Cukupauk	N								E. Pike Lake
DOLLY VARDEN Yuyak:	N								F. Mouth of Aniak River
RAINBOW TROUT Talaarq:	N								G. Aniak R., below Doestock (below Hooking Crk)
LAKE TROUT Cikignik:	N								H. Doestock Creek
BLACKFISH	N				Taluyaq				I. Aniak R., Doestock to Buskstock
SMELT	N				Dipnet				J. Buckstock River
									K. Aniak R: Buskstock to Salmon River
									L. Salmon River
									M. Aniak R: upstream of Salmon River
									O. Aniak Lake
									P. Owhat River
									R. Kolmakof River
									S. George River
									T. Holokuk River
									W. Oskawalk River
									X.
									Y.
									Z.

APPENDIX B. Annual Management Report for the Subsistence and Commercial Fisheries of the Kuskokwim Area, 2002

SUBSISTENCE SALMON FISHERY

Background

The Kuskokwim Area has long supported an important subsistence salmon fishery. Many households throughout the region are involved in harvesting, processing, and preserving of salmon for subsistence use. The seasonal movement of families from permanent winter communities to summer fish camps situated along rivers and sloughs continues to be a significant element of the annual subsistence harvest effort. Approximately 1,700 households in the Kuskokwim Management Area annually harvest salmon for subsistence use. Many other households, which are not directly involved in catching salmon, participate by assisting family and friends with cutting, drying, smoking, and associated preservation activities such as salting, canning and freezing. Alaska Department of Fish and Game Subsistence Division (ADF&G/SD) studies in the region indicate that fish contribute as much as 85 percent of the total pounds of fish and wildlife harvested in a community annually, and salmon as much as 53 percent of the total annual harvest (Coffing 1991). The harvest of salmon for subsistence use is as much as 650 pounds per capita in some Kuskokwim River communities (Coffing et al. 2001). The subsistence salmon fishery in the Kuskokwim Area is one of the largest and most important in the state, and represents one of the largest subsistence salmon fisheries in North America.

The Department of Fish and Game (Department) conducts annual household surveys to collect information about the harvest and use of salmon in the Kuskokwim Area. Prior to statehood, subsistence salmon harvest information was collected periodically by various federal departments and bureaus. After 1960, the Department began collecting subsistence salmon harvest information from fishers along the Kuskokwim River drainage through visits to fish camps by survey staff members during late July. Over the years, data collection methods changed several times. Harvest surveys were initiated in Quinhagak in 1967 and in Goodnews Bay and Platinum starting in 1979. The Division of Subsistence (Division) took over the annual subsistence salmon harvest surveys in 1988 under a reimbursable services agreement and has been responsible for collecting and analyzing the data since then. The Division made several changes to the methodology, including starting the data collection in October, well after the late summer/early fall salmon harvest has been completed. This was done primarily to improve estimates of the subsistence coho salmon harvest.

More recently, the Department has collaborated in data collection with the U.S. Fish and Wildlife Service (USF&WS) and local tribal organizations, including the Orutsararmiut Native Council (ONC) in Bethel and the Kuskokwim Native Association (KNA) in Aniak, to complete these annual surveys. These subsistence harvest surveys have aimed at gathering data on the harvest and use of chinook, chum, sockeye, and coho salmon. Pink salmon are harvested in the Kuskokwim Area, although they are generally available only during even numbered years (i.e. 2000, 2002, and 2004). Although data for subsistence pink salmon harvests are not usually collected during the annual fall survey efforts, some data have been collected from the communities of Bethel and Aniak since 2000, in association with specific cooperative fisheries harvest assessment projects in those two communities funded by the Fisheries Information

Service, Office of Subsistence Management. Other Division community-baseline studies conducted in the region have also included pink salmon harvest data.

There are 38 communities comprising approximately 4,500 households within the Kuskokwim Area (Figure 1). Approximately 75 percent of those 4,500 households are situated within the drainage of the Kuskokwim River. Bethel is the largest community in the region, containing approximately 1,500 households. Much of the salmon fishing effort occurs within the main stem of the Kuskokwim River; however, fishing also occurs in many of the tributaries that contain salmon. Residents of Quinhagak, Goodnews Bay, and Platinum, located along the southern shore of Kuskokwim Bay, harvest salmon stocks primarily from the Kanektok, Arolik, and Goodnews River systems. Residents of Kipnuk, Kwigillingok and Kongiganak, located on the northern Kuskokwim Bay, harvest salmon from within the Kuskokwim River drainage and also from local drainages entering Kuskokwim Bay. Residents of Toksook Bay, Nightmute, Tununak, Newtok, Chefornak and Mekoryuk, situated near the Bering Sea Coast, harvest salmon from coastal waters as well as local tributaries.

Eligibility, Licenses, Permits, and Gear

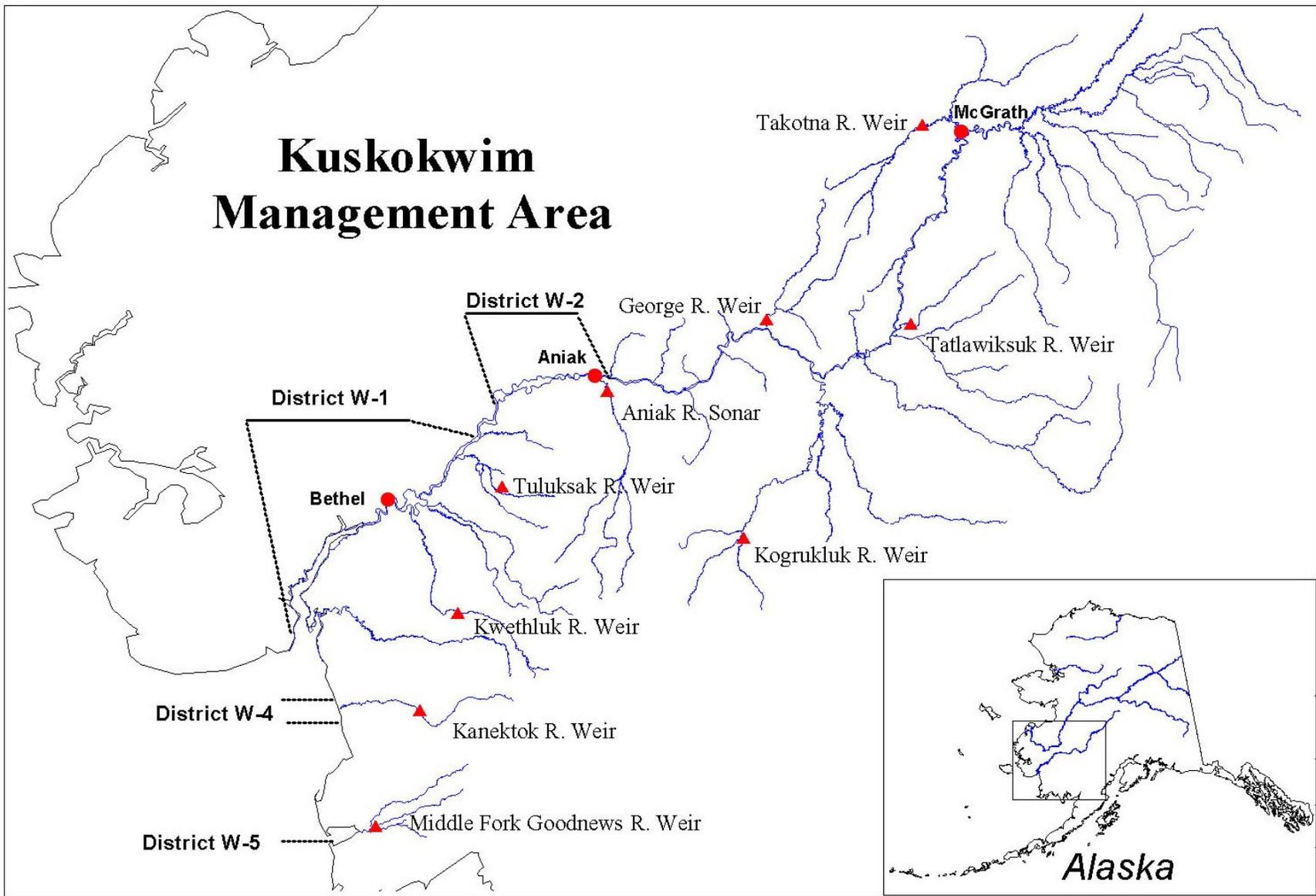
Statewide eligibility criteria have required that individuals be Alaskan residents for the 12 consecutive months before harvesting salmon for subsistence use. Licenses and permits have never been required for subsistence salmon fishing in the Kuskokwim Area, nor were any required during 2002. Additional restrictions on participation in the Kuskokwim salmon fishery were removed in 1990. Most individuals subsistence fishing for salmon in the Kuskokwim Area live in the region. People living in other parts of the state who have family or friends in the Kuskokwim region sometimes return to the area to assist friends or relatives with harvesting and processing of salmon.

Throughout the Kuskokwim Area, salmon harvested for subsistence use could be caught using set gillnets, drift gillnets, beach seines, and fish wheels. Rod and reel gear (line attached to a rod or pole) and hand lines were added as legal subsistence gear in much of the Kuskokwim Area in 2000, with modifications made to expand that regulation to the entire Kuskokwim Area in 2002. Spears were also legal subsistence fishing gear for harvesting salmon in the Holitna, Kanektok, Arolik, and Goodnews river drainages.

Throughout the Kuskokwim Area, there were no restrictions on the number of salmon that could be harvested annually by individual subsistence fishers or households. There were, however, daily limits on the number of salmon and other fish that could be harvested from that portion of the Aniak River drainage upstream of Doestock Creek using rod and reel gear from June 1 through August 31 (combined daily total of six, no more than three of which could be salmon). These subsistence bag limits did not apply to other gear types or to any other waters in the Kuskokwim Area.

The total length of set or drift gillnets in use by an individual fisher could not exceed 50 fathoms. Unless changed by emergency order, gill nets used for harvesting salmon in the Kuskokwim Area could be of any size mesh. There were limits on the depth of gillnets. Gillnets with six-inch or smaller mesh could not be more than 45 meshes in depth and nets with greater than six-

Figure 1. Map of Kuskokwim Management Area



inch mesh could not be more than 35 meshes in depth. Fishers were required to attach their name and address to all unattended gillnets and fish wheels.

In both 2001 and 2002 there were gear restrictions in effect during the subsistence fishing schedule closed days, when gillnets and fish wheels could not be used for harvesting salmon. During these closed salmon fishing days, fishers were restricted to using either hook and line gear or gillnets that were no longer than 60 feet in length and having a mesh size of 4 inches or less (“whitefish net”). These restrictions were in place during June and July throughout the Kuskokwim River drainage to minimize the harvest of chinook and chum salmon, but also to allow the harvest of non-salmon species such as whitefish and pike. All salmon that were caught using rod and reel gear and short “whitefish nets” could be kept for subsistence use.

Subsistence Salmon Fishing Schedule

During 2002 (for the second consecutive year), subsistence salmon fishing throughout the Kuskokwim River drainage was regulated by a fishing schedule that supported a salmon management rebuilding plan adopted by the Board of Fisheries in January 2001. The fishing schedule provided for periods of four consecutive days per week open to subsistence salmon fishing and three consecutive days per week when subsistence salmon fishing was closed to gillnet and fish wheel gear. The Department polled communities throughout the Kuskokwim River drainage for guidance on which four days would be most desirable. Based on community response and the recommendation of the Kuskokwim River Salmon Management Working Group, Wednesday through Saturday was selected as the period open to subsistence salmon fishing. Subsistence fishing with rod and reel gear was not included in this schedule nor were commercial and sport Kuskokwim River salmon fisheries

The subsistence salmon fishing schedule started June 2 in District 1, was expanded to include all waters downstream of Chuathbaluk starting June 9, and was further expanded to include all waters of the entire Kuskokwim River drainage starting June 16 (Figure 1). Some non-salmon tributaries in the lower and middle Kuskokwim River drainage were not closed by this schedule. Waters outside of the Kuskokwim River drainage were not affected by this schedule. Compliance with the schedule was excellent. Department staff made specific efforts to inform the public through the newspaper and radio media starting in late March, 2002, and continued through late June.

The rebuilding plan called for the schedule to be in effect during June and July. Monitoring of the returning chinook and chum salmon in the Kuskokwim River drainage was done through a cooperative in-season subsistence fishing monitoring project between the Department and the Orutsararmiut Native Council in the Bethel area, the Kuskokwim Native Association in the Kalskag and Aniak area, and the McGrath Native Village Council in the McGrath area. In addition to in-season monitoring, numerous cooperative biological assessment projects throughout the Kuskokwim River drainage supported the Department in opening commercial salmon fishing in Districts 1 and 2 in the Kuskokwim River on June 30, 2002. This was in response to relatively strong salmon returns and expectations that escapement needs would be met. Although surplus stocks allowed for the opening of commercial salmon fishing, because of a lack of buyers, there were no commercial periods announced until August in 2002.

Simultaneously, State and Federal subsistence salmon fishing regulations reverted back to open subsistence fishing seven days per week with gillnets and fish wheels, effectively ending the subsistence salmon fishing schedule for the 2002 fishing season. After that time, subsistence salmon fishing closures in the Kuskokwim River were those periodic closures associated with commercial fishing periods.

Periodic In-Season Subsistence Closures

Waters within the commercial salmon fishing districts were periodically closed to subsistence salmon fishing using net gear and fish wheels 16 hours before, during, and 6 hours after commercial salmon fishing periods. Many of the commercial fishers are local residents who also participate in the subsistence fishery. The purpose of the subsistence salmon fishing closures was to discourage illegal commercial fishing and the potential sale of subsistence salmon in the commercial fishery. The specific waters closed to subsistence fishing in each area varied. During 2002, the first periodic subsistence salmon fishing closure in the Kuskokwim River occurred from 1 a.m. August 1 until 1 a.m. August 3 in District 1. There were three additional periodic subsistence salmon fishing closures in District 1 between August 4 and August 13, and numerous periodic subsistence fishing closures in both District 4 (Quinhagak) and District 5 (Goodnews Bay-Platinum) areas from June through August.

Also in 2002, the Department issued an emergency order that modified the periodic subsistence fishing closure time in Kuskokuak Slough. By regulation, Kuskokuak Slough had remained open to subsistence salmon fishing seven days per week after July 31. The modified regulation established periodic subsistence salmon fishing closures in Kuskokuak Slough 16 hours before, during and 6 hours after each commercial fishing period anywhere in District 1, consistent with the remainder of District 1 waters. This change was also proposed for the 2004 AYK Board of Fisheries meeting.

SUBSISTENCE SALMON HARVEST SURVEYS

Methods

The methods used to gather subsistence salmon harvest data during 2002 were:

- 1) subsistence salmon catch calendars,
- 2) post-season community household surveys, and
- 3) postcard surveys.

The Division has maintained a community household database which includes a list of households in each surveyed community of the Kuskokwim Management Area. This database is

updated annually after the household surveys are completed each fall. Each household in the database is designated as either "usually fish" or "does not usually fish" depending on past fishing history. Households listed in the database were the basis of sampling and estimation of subsistence salmon harvests for the Kuskokwim Area. Each household on the list was assigned a unique identifier through which subsequent information could be tracked.

The goals of the post-season survey were to:

- 1) collect harvest data that would result in an estimate of the total subsistence salmon harvest by species for the Kuskokwim Management Area by community;
- 2) compile information on fishing effort, gear types, participation rates, and timing of the subsistence harvest;
- 3) update community household lists and identify fishing households; and
- 4) determine if subsistence fishing success during 2002 was better than average, average, or poor and, if poor, why.

Salmon Catch Calendars

The Department has been using subsistence catch calendars in the Kuskokwim Area since the early 1970s. In May 2002, subsistence salmon catch calendars were mailed to all Kuskokwim Area households that had been identified as "usually fish" and to all households that fished the previous fishing season. Three similar but unique catch calendars (Appendix S.1) were designed for recording the daily catch of each salmon species harvested for subsistence use. One style of calendar was sent to households in communities in an area that included: the lower and middle regions of the Kuskokwim River, the Bering Sea Coast and northern Kuskokwim Bay, and the upper Kuskokwim River region upstream as far as the community of Stony River. A second style of calendar was sent to the remaining households in the upper Kuskokwim River region, and a third style was sent to households in Quinhagak, Goodnews Bay, and Platinum. Differences in the style of calendar sent to households took into account the species available, salmon run timing, and timing of subsistence fishing activities. Where mailing addresses were available, the calendars were mailed to post office boxes; otherwise, calendars were sent general delivery for the post office to distribute. Each calendar was postage-paid and addressed for return to the Division office in Bethel. Subsistence salmon catch calendars were mailed to a total of 2,504 households in 2002.

Household Surveys

The primary method of collecting subsistence salmon harvest information was through the post-season household survey. Through this method, staff traveled to communities in the Kuskokwim Area and went house-to-house interviewing families. Similar to the approach used in developing the catch calendars, three color-coded survey instruments were used to survey the majority of the communities (Appendix S.2). Except for local terms used for the salmon species, the survey questions asked in each region were identical. The survey form used in Bethel and Aniak households also included a space for recording the household's address, and it quantified harvests by gear type and identified harvest locations for fish caught with hook and line gear. Both Bethel and Aniak surveys included questions aimed at collecting subsistence harvest information for non-salmon species.

During 2002, Division staff members conducted house-to-house surveys in 27 communities. Budget constraints precluded attempts to conduct house-to-house surveys in Mekoryuk, Newtok, Nightmute, Toksook Bay, Tununak, Cheforak, and Telida. As in past years, house-to-house surveys also were not done in the communities of Kwigillingok, Kipnuk, and Kasigluk. For the first time in several years, surveys were not done in Lime Village because of weather and logistical difficulties. Through funding administered by the U.S. Fish and Wildlife Service Office of Subsistence Management, the Orutsararmuit Native Council (ONC) in Bethel hired survey technicians to assist the Division in gathering data in Bethel. Through a similar funding arrangement between the Kuskokwim Native Association (KNA) in Aniak and the USF&WS Office of Subsistence Management, post-season surveys in Aniak were done by staff members of the Kuskokwim Native Association. In both of these cooperative efforts, the Division trained ONC and KNA staff members, provided the survey forms used to collect the data, and oversaw the survey efforts. The data collected by both ONC and KNA followed the protocols and methods developed by the Division.

Survey efforts occurred primarily over a two-month period, beginning in early October, after most residents had completed salmon fishing for the season and after most hunters had returned from fall moose and caribou hunting. Communities in which residents usually harvest salmon through late fall were surveyed in November. Time spent in any one community ranged from one-half day to two days depending on the size of the community. Surveys in Bethel were conducted over an 11-week period from early October, with preparations beginning in September.

Households were interviewed systematically. Prior to beginning the community surveys, efforts were made to inform and prepare residents for the arrival of staff members doing the surveys. This was done weeks or days in advance of their arrival through letters to city, tribal, or traditional council offices in each community, and using radio announcements, posters in public buildings and phone calls to community officials. Prior to traveling to each community, staff members identified households that had already mailed in or returned their salmon harvest calendars to the Division office in Bethel.

In Bethel, survey staff used a map of the community originally developed by the Bethel Fire Department. This map identified the street addresses of much of the community and was used to divide the community into areas that could be assigned to each of the two survey staff. This map was edited and modified using aerial photos taken in late August by the Division of Subsistence SRSIII in Bethel. Survey staff working in Bethel also had access to a list of all Bethel households identified through previous surveys and a list of households which had been sent and had completed and returned the salmon fishing calendar.

Upon arrival in a community, staff members checked in with the city or council office to introduce themselves and outline their task. Staff technicians used community household checklists, prepared in advance, to help them identify households they needed to contact while conducting household surveys. Each checklist contained a listing of a) all known households in the community, b) those households which were reported to have subsistence fished for salmon the previous year (2001), and c) households which were mailed 2002 catch calendars. Knowledgeable individuals in the community helped staff update the community household list

and identify which households "usually fished" and which households "usually did not fish". These individuals also helped to identify households that subsistence fished for salmon in 2002.

Attempts were made to contact all households that were either identified as "usually fish" or were known to have fished during 2002. Structured interviews were conducted with these households through the use of the survey instrument. Completed subsistence salmon catch calendars that had not been mailed back to the department were also collected during the interview, if available. If time permitted, other households on the community list were contacted about their salmon fishing activities.

Survey methods used in Bethel were initially designed to be the same as in the three previous years: to contact every household (a census) so that a more accurate list of households in Bethel could be developed. Unlike other regional communities, there was no single community entity in Bethel that could provide a current list of households in Bethel. Survey efforts in Aniak were also designed to complete a census of the community; that is, attempts were made to survey all households regardless of prior fishing history. There were changes in the survey staff hired by both ONC and KNA; some technicians quit and others were hired to replace them, delaying progress in the surveys in those two communities. The ADF&G staff hired to conduct village surveys remained through the entire project, marking the 13th year of working on the project for one of them and the second for the other. Overall, 2,631 households were surveyed in person, including 1,320 in Bethel and 163 in Aniak.

Postcard Surveys

The third method of collecting subsistence salmon harvest information was through the use of postcard surveys (Appendix S.3). The postcard survey simply asked if the household harvested salmon from the Kuskokwim Area for subsistence use during 2002, asked the species and quantities harvested, the type of fishing gear used, and the quality of fishing for each of the four salmon species usually harvested. The postcard could be separated in half and returned postage-paid to the Department. This type of survey was the primary method of obtaining harvest data from households in Kipnuk, Kwigillingok, Kasigluk, Mekoryuk, Newtok, Nightmute, Toksook Bay, Tununak and households in other communities which were not available at the time of the community surveys.

In Bethel, several postcard surveys were also left at occupied homes where multiple attempts to contact the residents to conduct an in-person survey failed because the residents were never home during the survey efforts. As a final effort to contact unsurveyed households in Bethel, those individuals on the "usually fish" strata for which the department had a mailing address were also mailed a survey postcard. Overall 300 postcards were distributed to Bethel residents. Several postcards were returned with an address correction indicating that the individual had moved away. If the address correction included a current address, a follow-up postcard was then sent to determine if the individual harvested salmon in the Kuskokwim Area during 2002. Overall, 1,655 households in the region were mailed postcard surveys.

Subsistence Salmon Harvest Estimation

Data from the three information sources (catch calendars, household and postcard surveys) were entered into a computer database. Data were verified against source documents, and several logic checks of the data were made. The Division's list of names and addresses of resident households was updated to reflect changes in household composition and number of households residing in each community. The unique household numbering system was maintained on the list and on the database tables containing information from each of the three information sources.

In order to provide a single best estimate for a household's harvest of a salmon species during 2002, information was compiled from the various information sources. This process was conducted by a single researcher on the project to ensure data consistency. In most cases, there were few discrepancies between the information available from the different sources. In those cases where a household was known to have fished for salmon but their harvest could not be quantified through any information source, the household's harvest was estimated based on the mean harvest in the "usually fishes" strata for that community. Likewise, if a household could not be contacted but was reported by a reliable source not to have fished, the household was assigned a harvest of "zero."

Guidelines developed during the course of the project to compile harvest information posited that:

- (1) the salmon catch calendar contained the best means of recording a household's harvest;
- (2) information from the different sources needed to be evaluated concurrently in order to identify the harvest for each species;
- (3) information from the different sources for a particular species could be different due to the timing of the collection of this information; and
- (4) information on the use of salmon to feed dogs could be used as a minimum estimate of the household's harvest if no other information was available.

Salmon harvests that were identified as "removed from the commercial catch for subsistence use" were included in the household's subsistence harvest. The Bethel and Aniak surveys did not include a question to specifically ask a household if they commercial fished for salmon during 2002. The Bethel and Aniak surveys form did, however, include a question aimed at determining the amount of the subsistence harvest obtained with each gear type used, including those caught while commercial fishing.

The average community catch (C_k) was estimated for salmon species from the composite catch per household data using the following formula:

$$C_k = \sum_{i=0}^1 (N_{ki} * C_{ki}) / \sum_{i=0}^1 N_{ki}$$

where

k = community

i = indicates whether the group "usually fishes" (1) or "usually does not fish"(0)

N_{ki} = number of households that "usually fish" or "usually do not fish"

C_{ki} = mean harvest for households that "usually fish" or "usually do not fish"

The total community catch (T_k) was estimated by $T_k = \sum_{i=0}^{N_{ki}} (N_{ki} * C_{ki})$ and its variance (V_k) includes a finite population correction factor:

$$V_k = \sum_{i=0}^{N_{ki}} ((N_{ki}^2)(1-(n_{ki}/N_{ki}))(s_{ki}^2/n_{ki}))$$

where n_{ki} = number of households for which information is available that "usually fish" or "usually do not fish" and s_{ki}^2 = variance for the amount harvested for the "usually fish" or "usually do not fish" households.

If fewer than 30 households, or less than 50 percent of all households in a stratum in a community were contacted, the reported harvest was used for the estimated harvest. Community catch estimates and their variances were summed across communities for regional subtotals and across all regions for Kuskokwim Management Area totals.

2002 Sampling Summary

A summary of the sampling information by community and fishing area is presented in Table 13. Of the estimated 3,759 households located in the Kuskokwim River drainage and the southern Kuskokwim Bay area, information was obtained for 2,759 (73%). Relatively few (39) of the estimated 580 households in the Bering Sea Coast area were contacted because the Division does not conduct household in-person surveys there.

A total of 1,711 households were classified as "usually fish." In 2002, 1,431 (84%) of these households were contacted. Households classified as "usually do not fish" for salmon totaled 2,628; however, this number included the majority (460) of households in the Bering Coast region, as well as 389 households in Kasigluk, Kipnuk and Kwigillingok where the household fishing status was not specifically known. Of the remaining 1,779 households identified as

Table 13. Sampling Summary for the Kuskokwim Area Subsistence Salmon Fishery, 2002.

COMMUNITY	Total HH'S	CALENDARS		POSTCARDS		NUMBER OF HOUSEHOLDS			
		Mailed	Returned	Mailed	Returned	Household Surveys	Any Info.*	Harvest Data**	Subsistence Fished
Kipnuk	176	15	1	175	0	0	1	1	1
Kwigillingok	95	3	0	95	0	0	0	0	
Kongiganak	<u>81</u>	<u>62</u>	<u>4</u>	<u>22</u>	<u>0</u>	<u>51</u>	<u>51</u>	<u>50</u>	<u>46</u>
NORTH KUSKOKWIM BAY	352	80	5	292	0	51	52	51	47
Tuntutuliak	76	65	15	15	2	60	64	63	56
Eek	73	49	20	15	4	49	54	54	47
Kasigluk	136	15	5	135	0	0	5	5	5
Nunapitchuk	102	73	20	31	9	70	81	79	69
Atmoutluak	56	41	5	15	3	43	46	46	33

Napakiak	90	59	11	23	2	65	66	65	58
Napaskiak	83	63	4	25	1	59	60	60	43
Oscarville	13	11	2	1	0	12	12	12	11
Bethel	1,499	627	87	305	43	1,263	1,320	1,306	579
Kwethluk	156	117	25	42	0	110	113	107	91
Akiachak	131	96	13	40	5	94	101	97	91
Akiak	71	51	6	14	3	52	55	54	47
Tuluksak	<u>80</u>	<u>63</u>	<u>4</u>	<u>23</u>	<u>2</u>	<u>54</u>	<u>55</u>	<u>53</u>	<u>50</u>
LOWER KUSKOKWIM RIVER	2,566	####	217	684	74	1,931	2,032	2,001	1,180
Lower Kalskag	69	42	10	10	3	51	56	54	34
Upper Kalskag	59	40	8	19	5	38	44	44	29
Aniak	165	111	21	3	0	162	163	163	120
Chuathbaluk	<u>30</u>	<u>23</u>	<u>5</u>	<u>7</u>	<u>2</u>	<u>20</u>	<u>22</u>	<u>20</u>	<u>17</u>
MIDDLE KUSKOKWIM RIVER	323	216	44	39	10	271	285	281	200
Crooked Creek	34	21	5	3	1	26	28	28	24
Red Devil	14	13	3	3	0	9	10	9	8
Sleetmute	34	27	8	3	0	26	27	27	17
Stony River	15	9	0	2	0	13	13	13	9
Lime Village	17	10	0	0	0	0	0	0	
McGrath	136	61	2	24	10	107	118	117	51
Takotna	20	5	0	0	0	16	16	16	3
Nikolai	36	23	3	4	0	29	30	30	16
Telida	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
UPPER KUSKOKWIM RIVER	308	169	21	39	11	226	242	240	128
Quinhagak	139	91	10	34	3	99	101	101	77
Goodnews Bay	55	41	4	6	2	41	43	43	30
Platinum	<u>16</u>	<u>12</u>	<u>1</u>	<u>3</u>	<u>0</u>	<u>12</u>	<u>12</u>	<u>12</u>	<u>7</u>
SOUTH KUSKOKWIM BAY	210	144	15	43	5	152	156	156	114
Mekoryuk	94	88	0	88	18	0	18	18	15
Newtok	79	79	0	79	5	0	5	4	4
Nightmute	68	66	0	60	3	0	3	3	0
Toksook Bay	136	131	2	130	8	0	8	8	5
Tununak	110	108	0	108	5	0	5	5	3
Chefornak	<u>93</u>	<u>93</u>	<u>0</u>	<u>93</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
BERING SEA COAST	580	565	2	558	39	0	39	38	27
KUSKOKWIM AREA TOTALS	4,339	####	304	1,655	139	2,631	2,806	2,767	1,696

* Includes information from all sources including fishing status derived from survey forms, calendars, postcards or in consultation with community officials.

** Includes information from households that did not harvest salmon and households which did provided harvest numbers.

“usually do not fish,” information was collected from 1,329 (75%). Many (978) of the households classified as "usually do not fish" resided in Bethel.

Information on fishing status specifically during 2002 (fished or didn't fish) was determined for 2,806 households. Of these, 1,696 households were identified as having harvested salmon

during 2002. Including households that were known not to have harvested salmon, harvest data was obtained for a total of 2,767 households.

Within the Kuskokwim River drainage and including northern Kuskokwim Bay communities, 2,603 (73%) of the 3,549 households were surveyed. Households that were determined not to have fished during 2002 were not targeted for the survey; however, some were surveyed. This region contains 82 percent of the total households in the Kuskokwim Area and 92 percent of those identified as fishing during 2002.

In the southern Kuskokwim Bay region, containing the communities of Quinhagak, Goodnews Bay, and Platinum, information on salmon fishing was obtained for 156 (74%) of the 210 households. A total of 114 households harvested salmon in 2002 for subsistence use.

A total of 580 households were estimated to exist for the communities of Mekoryuk, Newtok, Nightmute, Toksook Bay, Tununak and Chefornak. A current and complete list of households was not available for these communities. Because house-to-house surveys were not conducted in these communities, data were obtained only by postcard surveys and catch calendar returns. Forty-one households in this region provided information and 27 indicated that they harvested salmon. Based on previous years' data, actual participation in salmon harvesting activities by households in the Bering Coast area is thought to be much greater than that reported by catch calendars or postcard surveys alone.

For most communities, house-to-house surveys continue to be the most effective method for obtaining data on harvest and use of subsistence salmon. A total of 304 (12 %) of the 2,504 subsistence salmon calendars that were mailed pre-season were used and returned or picked up during the household surveys. There were 139 responses to the 1,655 postcard surveys that were mailed to Kuskokwim Area households.

2002 Harvest Summary

The 2002 total estimated subsistence salmon harvests for the Kuskokwim Area were 74,746 chinook, 76,818 chum, 28,844 sockeye, and 35,937 coho salmon (Table 14). Seventy-six Table 14. Subsistence Salmon Harvest Summary, Kuskokwim Area, 2002.

COMMUNITY	HOUSEHOLDS		CHINOOK		CHUM		SOCKEYE	
	Total	Contacted	Reported Harvest	Estimated Total	Reported Harvest	Estimated Total	Reported Harvest	Estimated Total
Kipnuk	176	1	1	1	5	5	11	11
Kwigillingok	95	0	0		0		0	
Kongiganak	<u>81</u>	<u>51</u>	<u>772</u>	<u>827</u>	<u>1,883</u>	<u>2,009</u>	<u>739</u>	<u>793</u>
N. KUSKOKWIM BAY	352	52	773	828	1,888	2,014	750	804
Tuntutuliak	76	64	3,081	3,704	3,260	3,920	824	991
Eek	73	54	1,959	2,432	1,004	1,259	604	748
Kasigluk	136	5	381	381	306	306	59	59
Nunapitchuk	102	81	3,206	4,007	5,703	7,137	1,122	1,422

Atmautluak	56	46	1,215	1,282	2,125	2,189	987	1,015
Napakiak	90	66	1,931	1,965	2,391	2,433	1,201	1,221
Napaskiak	83	60	2,729	3,856	2,632	3,720	908	1,292
Oscarville	13	12	953	953	1,121	1,121	377	377
Bethel	1,499	1,312	18,606	21,611	13,867	16,107	6,730	7,804
Kwethluk	156	113	4,902	6,884	5,682	7,966	1,501	2,126
Akiachak	131	101	5,540	7,138	4,089	5,252	1,996	2,534
Akiak	71	55	2,632	3,419	2,008	2,593	942	1,223
Tuluksak	<u>80</u>	<u>55</u>	<u>1,920</u>	<u>2,468</u>	<u>2,470</u>	<u>3,176</u>	<u>822</u>	<u>1,055</u>
LOWER KUSKOKWIM	2,566	2,024	49,055	60,100	46,658	57,179	18,073	21,867
Lower Kalskag	69	56	1,088	1,279	1,072	1,257	221	261
Upper Kalskag	59	44	1,251	1,420	2,153	2,333	433	485
Aniak	165	163	3,836	3,882	3,941	3,988	907	918
Chuathbaluk	<u>30</u>	<u>22</u>	<u>493</u>	<u>718</u>	<u>1,156</u>	<u>1,682</u>	<u>250</u>	<u>365</u>
MIDDLE KUSKOKWIM	323	285	6,668	7,299	8,322	9,260	1,811	2,029
Crooked Creek	34	28	713	790	1,212	1,266	401	413
Red Devil	14	10	180	283	236	371	67	105
Sleetmute	34	27	426	516	913	1,105	498	603
Stony River	15	13	262	293	507	560	412	460
Lime Village	17	0	0		0		0	
McGrath	136	118	649	709	634	676	309	329
Takotna	20	16	8	9	1	1	0	0
Nikolai	36	30	484	507	171	171	0	0
Telida	<u>2</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>0</u>	<u>—</u>	<u>0</u>	<u>—</u>
UPPER KUSKOKWIM	308	242	2,722	3,107	3,674	4,150	1,687	1,910
KUSKOKWIM RIVER	3,549	2,603	59,218	71,334	60,542	72,603	22,321	26,610
Quinhagak	139	101	1,880	2,475	1,381	1,839	650	855
Goodnews Bay	55	43	561	703	247	312	630	794
Platinum	<u>16</u>	<u>12</u>	<u>112</u>	<u>154</u>	<u>69</u>	<u>95</u>	<u>187</u>	<u>256</u>
S. KUSKOKWIM BAY	210	156	2,553	3,332	1,697	2,246	1,467	1,905
Mekoryuk	94	18	12	12	1,292	1,292	204	204
Newtok	79	5	13	13	20	20	85	85
Nightmute	68	3	0		0		0	
Toksook Bay	136	8	54	54	657	657	32	32
Tununak	110	5	1	1	0	0	8	8
Chefornak	<u>93</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>0</u>	<u>—</u>	<u>0</u>	<u>—</u>
BERING SEA COAST	580	39	80	80	1,969	1,969	329	329
KUSKOKWIM TOTALS	4,339	2,798	61,851	74,746	64,208	76,818	24,117	28,844

NOTE: If fewer than 30 households in a community or less than 50% of households in a community stratum were contacted, then reported harvest is used for estimated harvest. Data includes salmon retained for subsistence use from commercial catch. Blanks indicate that no estimate is available

percent of the total estimated subsistence salmon harvest in the Kuskokwim Area was taken by residents of communities located from Tuluksak downstream to Eek. The estimated salmon

harvest by the community of Bethel represented 27 percent of the total estimated harvest in the Kuskokwim Area, although Bethel comprises 35 percent of the total households in the region.

The total harvest of all species of subsistence salmon for the entire Kuskokwim Area during 2002 was about the same as that of 2001. During 2002, the subsistence chum salmon harvest increased by 50 percent over the 2001 harvest, which was a relatively low harvest. The 2002 chum salmon harvest was still about 3 percent below the 1989 to 2001 average harvest for the area (Appendix A.13). In contrast, the 2002 sockeye salmon harvest was 44 percent lower than the 2001 sockeye harvest, and 31 percent lower than the 1989 to 2001 average harvest (Appendix A.11).

The 2002 chinook salmon harvest in the Kuskokwim Area was about the same as it was in 2001. The slight decline was likely due to a reduction in the estimated harvest in Bethel for 2002 compared to the 2001 harvest. The 2002 chinook harvest was still about 12 percent below the 1989 to 2001 harvest for the Kuskokwim Area (Appendix A.10). The 2002 coho harvest increased by 13 percent over the 2001 catch but was still about 8 percent below the 1989 to 2001 harvest (Appendix A.12).

Harvest trends described above were also true for the Kuskokwim River drainage, where most of the salmon harvested in the Kuskokwim Area are caught. While chinook salmon harvests in the lower Kuskokwim declined slightly, chinook harvests in the middle Kuskokwim River increased by 15 percent and in the upper Kuskokwim Area increased by about 41 percent over the 2001 harvests in the same areas. Chinook harvests in both Quinhagak and Goodnews Bay/Platinum also declined from 2001. The 2002 chinook harvest in Quinhagak was 31 percent lower than the 1989 to 2001 average.

Sockeye salmon harvests were down about the same percentages (46 to 48 percent) in each portion of the Kuskokwim River and down only slightly in Quinhagak (6 percent) compared to 2001. Compared to catches since 1989, sockeye salmon catches were down by at least 28 percent in each portion of the Kuskokwim River and down by 24 percent in Quinhagak. Only in Goodnews Bay/Platinum were catches higher.

The stronger chum salmon return in 2002 resulted in increased harvests ranging from 35 percent over the 2001 harvest in the middle Kuskokwim area to 53 percent higher in the upper Kuskokwim Area. However, chum salmon catches in both the middle and upper Kuskokwim regions during 2002 were 12 percent and 35 percent below the 1989 to 2001 average respectively. Chum salmon catches in the lower Kuskokwim River area during 2002 were equal to the average harvests from 1989 through 2001.

Coho salmon harvests during 2002 had the greatest relative increase in the middle and upper Kuskokwim regions (38 percent and 32 percent respectively), with a slight increase in the lower Kuskokwim region of 11 percent compared to the 2001 catch. Compared to the 1989 to 2001 average coho catch, the middle Kuskokwim Area was substantially higher (52 percent) and the upper Kuskokwim was significantly lower (31 percent). Coho harvests in both Quinhagak and Goodnews Bay/Platinum during 2002 were more than 50 percent below the 1989 to 2001 harvest.

Historically, the harvest of salmon for use as dog food was a significant portion of the overall subsistence harvest of salmon, specifically for chum and coho salmon. Over the past 10 years, the number of households harvesting salmon specifically for dog food has declined. During 2002, relatively few salmon were harvested specifically for dog food in the Kuskokwim Area, with 71 households reporting harvesting salmon specifically to process and use as dog food. Chum salmon represented the majority of the reported harvest for dog food, at 5,918 fish. Coho salmon accounted for 1,321 fish and sockeye contributed a reported 513 fish for dog food. Residents do not specifically target chinook salmon for dog food, although some chinook salmon that are unfit for human food because of their condition may be fed to dogs so that they are not wasted. It is common for most households to feed scraps, backbones, entrails and salmon that are unfit for human consumption to their dogs so that nothing is wasted. When asked the question about feeding salmon to dogs, a total of 247 households responded that they fed the scraps, entrails and salmon backbones to dogs but that they did not harvest and process salmon specifically for dog food.

Subsistence fishing households often use more than one type of gear (i.e. set gillnet, drift gillnet, fishwheel or rod and reel) when harvesting salmon. Households that harvested salmon were asked to provide information on the types of gear they used. The most common gear type used throughout the Kuskokwim Area was drift gillnet. During the 2002 season, 1,153 households reported using drift gillnets when harvesting subsistence salmon. Drift net gear was used by the majority of fishing households from Crooked Creek downriver and including the coastal communities (Table 15). Set gillnets were also used throughout the Kuskokwim Area, although they were used in a greater proportion than were drift gillnets in the upper Kuskokwim River communities, as well as in Mekoryuk located on Nunivak Island. Overall, 313 households reported using set gillnets when harvesting salmon.

Rod and reel gear is used for subsistence fishing in many communities throughout the Kuskokwim Area. Rod and reel gear is used by families that may not have access to other gear types. It is used by fishers in areas where other gear types are not as effective or efficient, and is used to harvest relatively fewer fish when fewer are needed. Chinook and coho salmon are the two salmon species most frequently harvested by rod and reel gear. Rod and reel gear is the

Table 15. Gear Types Reported Used for Subsistence Salmon Fishing, Kuskokwim Area, 2002.

COMMUNITY	Number of Households Reporting Type of Subsistence Fishing Gear Used						
	Set Gillnet	Drift Gillnet	Fish Wheel	Rod and Reel	Seine	Spear	Unknown
Kipnuk	0	0	0	0	0	0	1
Kongiganak	1	35	0	0	0	0	10
NORTH KUSKOKWIM BAY	1	35	0	0	0	0	11
Tuntutuliak	3	40	0	4	0	0	14
Eek	13	30	0	8	0	0	7

Kasigluk	0	0	0	0	0	0	5
Nunapitchuk	3	56	0	0	0	0	12
Atmautluak	0	23	0	0	0	0	10
Napakiak	15	39	0	1	0	0	14
Napaskiak	13	32	0	4	0	0	10
Oscarville	1	11	0	0	0	0	0
Bethel	61	450	0	121	0	0	38
Kwethluk	31	65	0	32	0	0	14
Akiachak	22	67	0	9	0	0	17
Akiak	20	27	0	3	0	0	13
Tuluksak	<u>18</u>	<u>42</u>	<u>0</u>	<u>17</u>	<u>0</u>	<u>0</u>	<u>5</u>
LOWER KUSKOKWIM RIVER	200	882	0	199	0	0	159
Lower Kalskag	8	23	0	2	0	0	7
Upper Kalskag	7	19	0	6	0	0	6
Aniak	13	62	2	75	0	0	1
Chuathbaluk	<u>7</u>	<u>11</u>	<u>0</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>3</u>
MIDDLE KUSKOKWIM RIVER	35	115	2	86	0	0	17
Crooked Creek	4	16	0	5	0	0	6
Red Devil	6	1	0	4	0	0	1
Sleetmute	6	12	0	5	0	0	1
Stony River	5	1	0	4	0	0	1
Lime Village	0	0	0	0	0	0	0
McGrath	17	6	0	25	0	0	10
Takotna	0	0	0	3	0	0	0
Nikolai	<u>8</u>	<u>0</u>	<u>0</u>	<u>9</u>	<u>0</u>	<u>0</u>	<u>2</u>
UPPER KUSKOKWIM RIVER	46	36	0	55	0	0	21
KUSKOKWIM RIVER	282	1,068	2	340	0	0	208
Quinhagak	6	43	0	19	0	0	22
Goodnews Bay	6	24	0	4	0	0	4
Platinum	<u>4</u>	<u>6</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>
SOUTH KUSKOKWIM BAY	16	73	0	23	0	0	27
Mekoryuk	11	2	0	6	3	0	0
Newtok	0	4	0	0	0	0	0
Toksook Bay	2	5	0	0	0	0	0
Tununak	<u>2</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>
BERING SEA COAST	15	12	0	6	3	0	1
KUSKOKWIM AREA TOTALS	313	1,153	2	369	3	0	236

Note: Data on households that subsistence fished is based upon house to house surveys, returned returned postcards or calendars. Households using multiple gear types are listed for each gear type reported. Communities where gear type information was not provided are not listed.

primary gear type used by McGrath and Nikolai residents for harvesting subsistence chinook salmon. Use of rod and reel gear is also popular for harvesting coho salmon during August and provides a method by which individuals and families can harvest what they need without fear of catching too many with a gillnet. During 2002, 369 households in 23 communities reported using rod and reel gear to harvest salmon for subsistence use.

Fishwheels are also used in the middle and upper Kuskokwim River areas for harvesting salmon. This gear type is most frequently used by fishers in Aniak, Stony River, Lime Village and McGrath. Fishwheels in the Kuskokwim River are used primarily for harvesting sockeye, chum and coho salmon. During 2002 there were two households that reported using fishwheel gear for harvesting salmon; both were in Aniak. There are generally one or two fishwheels operated by households in McGrath; however, during 2002, none of the households that reported harvest numbers to the Division reported using a fishwheel. It is possible that households that did use a fishwheel were not available to be surveyed and did not return a survey postcard. During 2002, no households reported using spears for harvesting salmon. Three households in Mekoryuk reported using seine gear to harvest salmon for subsistence.

Households that are involved in commercial salmon fishing sometimes keep some salmon caught through their commercial fishing activities to bring home for subsistence use. The number of salmon retained from commercial fishing activities for subsistence use is usually relatively low. During 2002 there were no commercial salmon fishing periods in the Kuskokwim River drainage until early August. There were, however, commercial fishing periods in Districts 4 and District 5 during June and July as well as August. Forty-one households reported retaining salmon for subsistence use from commercial fishing activities during 2002 (Table 16). The amount of salmon reportedly kept for subsistence use from commercial harvests amounted to 56 chinook, 15 chum, 77 sockeye and 177 coho salmon.

Fishing households that were interviewed in person and those that were mailed a survey postcard were asked to respond to a qualitative question about their subsistence salmon fishing for the

Table 16. Salmon Reported Retained From Commercial Catches for Subsistence Use in the Kuskokwim Area, 2002.

COMMUNITY	Number of Households		Number of Salmon Retained From Commercial Catch For Subsistence Use			
	Reported Commercial Salmon Fishing	Retained Commercial Caught Salmon For Subsistence	Chinook	Chum	Sockeye	Coho
	Kongiganak	8	0	0	0	0
N. KUSKOKWIM BAY	8	0	0	0	0	0
Tuntutuliak	22	4	0	0	0	70
Eek	18	2	11	0	8	6
Nunapitchuk	19	0	0	0	0	0

Atmautluak	6	2	0	1	0	1
Napakiak	9	0	0	0	0	0
Napaskiak	12	4	4	0	0	20
Oscarville	3	2	0	0	0	2
Bethel *	4	4	17	0	30	18
Kwethluk	27	1	0	0	0	1
Akiachak	38	4	2	6	1	12
Akiak	9	2	2	1	1	1
Tuluksak	<u>11</u>	<u>2</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>0</u>
LOWER KUSKOKWIM	178	27	39	8	40	131
Lower Kalskag	0	0	0	0	0	0
Upper Kalskag	1	0	0	0	0	0
Aniak *	0	0	0	0	0	0
Chuathbaluk	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
MIDDLE KUSKOKWIM	1	0	0	0	0	0
Crooked Creek	0	0	0	0	0	0
Red Devil	0	0	0	0	0	0
Sleetmute	0	0	0	0	0	0
Stony River	0	0	0	0	0	0
Lime Village	0	0	0	0	0	0
McGrath	0	0	0	0	0	0
Takotna	0	0	0	0	0	0
Nikolai	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
UPPER KUSKOKWIM	0	0	0	0	0	0
Quinhagak	37	13	15	7	30	41
Goodnews Bay	14	1	2	0	7	5
Platinum	<u>3</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
S. KUSKOKWIM BAY	54	14	17	7	37	46
TOTAL	241	41	56	15	77	177

NOTE: Data are based only upon surveyed households without expansion to the community as a whole. Communities that are not listed were not surveyed in person.

* Only those Bethel and Aniak households reporting they retaining fish from commercial fishing activities were identified as commercial fishing.

season. The purpose of this question was to learn how households viewed the quality of their 2002 subsistence fishing. Households were asked to rate their subsistence fishing success for each of the four species surveyed (chinook, sockeye, chum, and coho) as “Very Good,” “Average,” or “Poor”. A total of 1,198 households responded to this survey question (Table 17).

The majority of the responding households rated their subsistence fishing during 2002 as very good or average. Harvest success was highest for coho (88 percent), chum (85 percent) and chinook salmon (83 percent). Sixty-three percent of the households that responded regarding sockeye fishing during 2002 indicated that fishing was very good or average; with most of those (44 percent) indicating only average fishing success and 19 percent indicating very good fishing success. Thirty-seven percent rated sockeye fishing during 2002 as poor.

Since the Division began asking fishing households to rate their fishing success in the early 1990s, the upriver fishers have always rated their fishing success lower than fishers located further downriver. During 2002, responses as to fishing success were similar in the lower, middle and upper Kuskokwim River areas.

A total of 166 households that rated their 2002 chinook fishing as poor also provided reasons why they rated it as they did. Sixty-nine households reported that there were not enough fish. Seven households indicated that it was too sunny and hot and that the fish were deeper than usual, and eight households had gear or equipment problems. Twenty-two households located in both the lower Kuskokwim (12) and the middle Kuskokwim (10) reported that the subsistence fishing schedule prevented them from harvesting enough chinook salmon. Other reasons given were of a personal nature.

One hundred and eleven households reported chum salmon fishing as poor. Forty-three of these households indicated low numbers of fish returning as the reason. Thirteen households identified the subsistence salmon fishing schedule as the reason that their chum salmon fishing was poor; seven identified gear or equipment problems and remaining reasons were of a personal nature.

A total of 296 households rated their sockeye salmon fishing as poor. Most (169) indicated that there were relatively few sockeye salmon available during the 2002 fishing season. Few (17) indicated the subsistence fishing schedule as the reason. Personal reasons were reported by many families as to why fishing was poor. Seventy four households rated subsistence coho salmon fishing as poor for 2002. Thirty-five households reported a weak coho return as the reason, and personal reasons accounted for the rest.

Table 17. Quality of Subsistence Salmon Fishing, Kuskokwim Area, 2002.

COMMUNITY	Number of Households Responding	Percent of Households Reporting Quality of Subsistence Fishing							
		CHINOOK		CHUM		SOCKEYE		COHO	
		Very Good or Average	Poor	Very Good or Average	Poor	Very Good or Average	Poor	Very Good or Average	Poor
Kongiganak	<u>31</u>	<u>84</u>	<u>16</u>	<u>81</u>	<u>19</u>	<u>73</u>	<u>27</u>	<u>79</u>	<u>21</u>
N. KUSKOKWIM BAY	31	84	16	81	19	73	27	79	21
Tuntutuliak	39	92	8	91	9	55	45	100	0
Eek	32	84	16	71	29	73	27	80	20
Nunapitchuk	56	84	16	93	7	53	47	87	13
Atmautluak	22	77	23	86	14	45	55	73	27
Napakiak	39	85	15	91	9	42	58	76	24
Napaskiak	29	79	21	82	18	35	65	88	12
Oscarville	11	82	18	78	22	22	78	67	33
Bethel	420	85	15	86	14	70	30	90	10
Kwethluk	67	90	10	83	17	56	44	78	22
Akiachak	64	83	17	69	31	60	40	85	15
Akiak	30	87	13	82	18	77	23	94	6
Tuluksak	<u>43</u>	<u>79</u>	<u>21</u>	<u>85</u>	<u>15</u>	<u>74</u>	<u>26</u>	<u>91</u>	<u>9</u>
LOWER KUSKOKWIM	852	85	15	84	16	63	37	88	12
Lower Kalskag	20	75	25	81	19	50	50	90	10
Upper Kalskag	20	80	20	67	33	47	53	73	27
Aniak	86	87	13	93	7	67	33	98	2
Chuathbaluk	<u>12</u>	<u>50</u>	<u>50</u>	<u>100</u>	<u>0</u>	<u>64</u>	<u>36</u>	<u>80</u>	<u>20</u>
MIDDLE KUSKOKWIM	138	81	19	87	13	61	39	93	7
Crooked Creek	17	76	24	82	18	41	59	100	0
Red Devil	5	60	40	100	0	0	100	100	0
Sleetmute	13	77	23	83	17	58	42	100	0
Stony River	8	50	50	88	13	63	38	88	13
McGrath	35	80	20	89	11	64	36	64	36
Takotna	2	50	50	0	100	100	0	0	100
Nikolai	<u>13</u>	<u>85</u>	<u>15</u>	<u>100</u>	<u>0</u>	<u>67</u>	<u>33</u>	<u>0</u>	<u>100</u>
UPPER KUSKOKWIM	93	75	25	87	13	53	47	88	12
KUSKOKWIM RIVER	1,114	83	17	85	15	62	38	89	11
Quinhagak	41	93	7	90	10	68	32	93	7
Goodnews Bay	25	80	20	95	5	77	23	73	27
Platinum	<u>6</u>	<u>100</u>	<u>0</u>	<u>100</u>	<u>0</u>	<u>83</u>	<u>17</u>	<u>50</u>	<u>50</u>
S. KUSKOKWIM BAY	72	89	11	93	7	73	27	85	15
Mekoryuk	4	50	50	91	9	50	50	70	30
Newtok	2	50	50	100	0	100	0		100
Toksook Bay	5	20	80	75	25	100	0	80	20

Tununak	1	<u>100</u>	<u>0</u>	<u>100</u>	<u>0</u>	<u>100</u>	<u>0</u>	<u>100</u>	<u>0</u>
BERING SEA COAST	12	42	58	88	12	83	17	78	22
KUSKOKWIM AREA	1,198	83	17	85	15	63	37	88	12

The question asked was "How was subsistence salmon fishing for your household this year?"
 Data are reported from households that were surveyed in person or returned postcards surveys. There were no responses to this question on the survey postcards from Kipnuk, Kwigillingok, Nightmute, Chefnak and Kasigluk. Lime Village and Telida were not surveyed.

Appendix A.10. Kuskokwim Area subsistence Chinook Salmon Harvest by Community, 1960 - 2002.

Community	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Kipnuk	248	11	123	75	a						
Kwigillingok	250	35	43	106	339	a	250	957	70		220
Kongiganak	b	b	b	b						385	891
Tuntutuliak	226	2,226	842	2,853	1,826	1,575	3,097	3,462	2,214	2,195	3,558
Eek				c	c	2,921	4,572	2,566	2,038	2,065	1,882
Kasigluk & Eek					1,857	3,123					
Kasigluk	135	1,215	127	1,302	c	c	1,032	2,766	1,485	2,888	3,931
Nunapitchuk	683	2,042	848	1,874	636	490	2,213	1,926	1,750	2,279	4,680
Atmautluak	b	b	b	b	b	b	b	b	b	b	1,205
Napakiak	1,830	2,573	2,191	3,148	2,677	2,872	3,658	3,895	2,468	3,546	4,960
Napaskiak	536	1,258	759	1,569	2,201	1,071	2,710	2,998	1,663	2,227	3,446
Oscarville	1,968	282	75	309	339	688	322	1,127	393	457	542
Bethel	1,923	4,150	1,378	7,019	4,114	3,371	8,046	13,925	6,205	7,472	17,026
Kwethluk	2,692	3,763	2,329	5,050	3,262	2,887	6,551	6,993	2,848	3,187	7,932
Akiachak	1,626	3,052	1,800	2,533	3,488	3,685	4,904	5,543	3,755	2,602	7,022
Akiak	1,865	3,159	906	2,869	2,495	1,345	3,670	3,660	1,822	1,275	3,290
Tuluksak	737	1,486	493	1,295	572	1,021	1,576	1,709	1,048	1,131	1,995
Lower Kalskag	961	571	c	c	710	c	c	c	1,502	2,102	2,146
Upper Kalskag	667	1,049	c	c	1,143	c	c	c	1,619	1,623	734
Kalskags Comb.			805	2,661		1,395	3,379	3,567			
Aniak	1,057	688	185	602	1,104	c	2,072	1,280	517	1,406	2,136
Aniak ^d					642						
Chuathbaluk	64	54	10	30	74	c	139	217	34	180	219
Napaimute	20	16	44	52	134	a	78	60	94	19	22
Crooked Creek	747	518	561	859	1,358	374	1,446	585	77	541	684
Georgetown							12		0	9	2
Red Devil	c	40	c	c	c	c			111	142	232
Sleetmute	c	222	c	c	c	c	303	343	207	267	161
Sleetmute ^e	465	262	144	228	314	79					
Kashegelok ^f							10				
Stony River	435	25	31		299	79	636	303	176	2,187	105
Lime Village										50	15
Mcgrath							300	25			
Takotna											
Nikolai											
Telida											
Quinhagak								1,349	2,756		
Goodnews Bay											
Platinum											
Total	18,887	28,934	13,582	34,482	29,017	24,697	49,325	61,262	35,698	40,617	69,612

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Appendix A.10. Continued (Page 2 of 4)

Community	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Kipnuk ^g											
Kwigillingok ^g	200	10				75	382	75			
Kongiganak	41					122	361				
Tuntutuliak	1,841	3,214	2,859	1,577	3,492	4,807	2,470	1,656	2,268	2,545	4,446
Eek	1,969		1,981	2,356	2,110	3,232	2,675	1,807	2,003	1,557	1,731
Kasigluk	1,645	1,292	1,864	1,411	1,713	1,613	1,324	608	1,142	1,704	3,377
Nunapitchuk	1,978	2,496	2,663	1,165	2,092	2,578	2,622	2,178	2,109	2,612	2,918
Atmautluak	548	864	1,106	382	1,042	1,159	1,015	966	2,242	1,288	1,247
Napakiak	1,868	2,009	1,763	1,224	2,864	3,330	2,702	2,140	2,191	2,582	3,017
Napaskiak	1,916	1,578	2,048	900	2,303	3,566	1,989	2,122	2,085	3,160	2,911
Oscarville	570	196	586	180	891	623	672	349	629	477	495
Bethel	8,731	8,371	8,898	4,631	11,688	13,215	9,408	6,905	11,564	12,591	15,367
Kwethluk	5,564	5,137	3,444	2,694	3,179	4,193	5,563	3,172	6,919	7,627	6,167
Akiachak	4,818	3,872	2,592	1,726	3,534	4,915	5,407	2,951	4,818	5,405	3,094
Akiak	2,688	1,899	1,895	1,292	2,837	3,076	2,880	1,850	3,567	3,355	2,386
Tuluksak	1,280	1,318	1,322	883	1,338	1,411	2,906	1,906	1,489	2,807	2,446
Lower Kalskag	2,355	2,604	1,309	1,586	2,755	4,536	1,750	1,951	2,821	3,917	3,271
Upper Kalskag	601	401	938	463	1,752	1,413	2,813	1,253	1,590	1,889	1,171
Aniak	1,076	2,105	1,030	1,952	1,391	1,490	4,991	1,331	2,634	2,750	3,102
Chuathbaluk	179	261	942	674	594	657	1,507	1,238	2,189	1,507	841
Napaimute	17	20	13	6	16	420	176	144	149	90	45
Crooked Creek	291	183	269	650	238	264	619	488	728	654	512
Georgetown							66			93	
Red Devil	135	182	138	205	623	195	324	153	488	255	298
Sleetmute	181	69	504	269	256	356	684	300	755	220	728
Kashegelok ^f						156	233	92			
Stony River	402	95	287	439	761	620	33	182	171	332	233
Lime Village	2,119				100	33			38		
McGrath									581		
Takotna									65		
Nikolai									60		500
Telida											
Quinhagak							2,012	2,328	1,420	1,940	2,562
Goodnews Bay							574		228	498	1,309
Platinum									110	192	100
Total	43,013	38,176	38,451	26,665	47,569	58,055	58,158	38,145	57,053	62,047	64,274

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Appendix A.10. Continued (Page 3 of 4)

Community	1982	1983	1984	1985	1986	1987	1988 ¹	1989	1990	1991	1992
Kipnuk ^g	60							54	108	80	
Kwigillingok ^g											9
Kongiganak	52			235			585	1,412	1,442	778	904
Tuntutuliak	1,984	2,523	3,519	2,644	2,452	2,522	2,741	3,781	4,044	4,143	3,524
Eek	2,578	2,040		1,436			2,212	1,580	4,920	2,360	2,232
Kasigluk	3,115			2,054			1,367	2,173	3,167	2,955	94
Nunapitchuk	2,577	2,688		2,019	3,410	3,372	2,297	3,170	3,199	4,106	3,575
Atmautluak	1,752			1,559			1,131	1,227	2,569	1,784	1,422
Napakiak	3,500	2,047		1,805		2,760	3,091	3,710	4,158	2,543	3,328
Napaskiak	2,872			2,155		2,907	3,898	4,699	4,972	3,864	4,133
Oscarville	523			916		745	415	1,591	898	1,422	122
Bethel	13,516	8,492	11,066	6,940	11,984	8,107	15,038	24,655	19,641	28,817	17,196
Kwethluk	5,897		6,732	4,937	5,824	8,779	10,976	7,562	9,218	7,511	6,504
Akiachak	4,468		5,588	3,254		4,871	9,563	5,504	7,168	5,657	4,163
Akiak	2,745		3,413	2,975		3,683	3,706	4,811	5,178	3,247	3,207
Tuluksak	2,220	1,671	2,286	2,749		3,712	3,289	3,791	1,878	3,351	2,382
Lower Kalskag	2,594		3,242	1,707	1,666		3,024	3,337	2,494	3,947	2,269
Upper Kalskag	963		657	605	587		859	1,256	1,558	1,105	1,366
Aniak	2,071	3,174	1,847	1,828	4,624	2,131	4,071	3,406	3,189	3,261	3,955
Chuathbaluk	1,491			1,102			34	403	1,674	791	933
Napaimute	138			53							
Crooked Creek	515			218			618	451	929	947	472
Red Devil	273			176			263	189	273	168	328
Sleetmute	242		154	745			433	420	711	770	801
Stony River	419			167			315	692	498	586	233
Lime Village							341	105	240	60	
McGrath	160	830	730	59			440	418	1,231	880	1,038
Takotna							100	62	62	0	0
Nikolai	778	750	795	615			136	716	560	421	605
Telida								1			0
Quinhagak	2,402	2,542	3,109	2,341	2,682	3,663	3,690	3,542	6,013	3,693	3,447
Goodnews Bay	1,185	1,004	597	399	513	640	289	419	351	894	318
Platinum	51	62	32	27	42	176	21	48	188	23	56
Mekoryuk ^g								0	0	0	0
Newtok ^g							14	5	1	0	
Nightmute ^g							17	0	3	20	
Toksook Bay ^g							81	127	143	25	49
Tununak ^g							52	5	0	15	
Other											21
Total	61,141	51,020 ^h	60,668 ^h	45,720	54,256 ^h	71,804 ^h	75,107	85,322	92,678	90,224	68,665

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Appendix A.10. Continued (Page 4 of 4).

Community	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Kipnuk ^g	348	150				119	29	170	1	1
Kwigillingok ^g	80	7		15		100				
Kongiganak	781	1,271	843	830	1,609	1,250	1,320	1,299	1,454	827
Tuntutuliak	3,633	4,679	4,023	4,027	3,730	4,008	3,645	2,939	2,993	3,704
Eek	2,619	2,917	3,535	2,568	2,253	2,131	1,816	2,112	1,728	2,432
Kasigluk	548	694	392	579	880	541	480	731	588	381
Nunapitchuk	3,810	4,746	4,400	3,234	4,086	4,934	4,521	3,354	3,250	4,007
Atmautluak	1,818	1,819	1,918	1,801	1,768	1,452	1,469	1,174	740	1,282
Napakiak	3,972	3,545	3,902	3,784	2,873	3,504	2,380	2,178	2,290	1,965
Napaskiak	5,671	6,356	4,984	4,453	4,887	5,452	3,827	4,309	4,662	3,856
Oscarville	1,475	1,385	1,438	996	512	981	2,289		1,753	953
Bethel	22,083	24,515	29,568	20,783	21,253	23,963	24,996	22,515	27,209	21,611
Kwethluk	9,181	9,262	8,931	9,183	6,872	7,940	6,081	4,925	6,127	6,884
Akiachak	7,231	8,081	6,571	5,209	7,414	6,507	5,373	6,124	6,445	7,138
Akiak	4,280	4,759	4,118	4,569	3,378	3,311	2,356	2,190	3,369	3,419
Tuluksak	3,755	4,534	4,333	3,143	5,627	3,701	2,348	2,432	2,451	2,468
Lower Kalskag	3,930	3,976	5,321	2,870	3,549	2,041	1,787	1,822	2,181	1,279
Upper Kalskag	1,679	1,340	1,396	1,351	1,107	1,244	1,688	1,237	1,014	1,420
Aniak	4,618	3,413	3,422	3,204	3,794	3,508	2,596	3,117	2,524	3,882
Chuathbaluk	1,447	1,043	2,615	880	1,290	810	1,110	303	627	718
Crooked Creek	771	968	934	864	944	772	681	575	508	790
Red Devil	487	379	425	337	452	262	161	94	175	283
Sleetmute	1,767	1,327	885	1,230	1,171	947	447	430	473	516
Stony River	445	359	559	597	863	445	55	21	139	293
Lime Village	41	216	144	48	59	241	155	45	262	
McGrath	567	1,052	800	1,203	974	769	1,295	642	360	709
Takotna	0	0		0		2	0	0	5	9
Nikolai	475	449	979	305	232	330	288	155	282	507
Telida										
Quinhagak	3,368	3,995	2,746	3,075	3,433	4,041	3,167	3,106	2,923	2,475
Goodnews Bay	628	712	858	403	437	713	805	601	859	703
Platinum	80	72	25	12	12	5	66	102	36	154
Mekoryuk ^g	0	6		0		1	15	2		12
Newtok ^g	0	2						19	12	13
Nightmute ^g		8					6	8		
Toksook Bay ^g	128	341	94	45	47	48	407	58	130	54
Tununak ^g	5	0				40	0	52		1
Chefornak ^g						2				
Other										
Total	91,721	98,378	100,159	81,598	85,506	86,115	77,660	68,841	77,570	74,746

Blanks indicate missing data.

a Data collected, combined with unspecified village or villages.

b Village not yet founded.

c Data collected, but reported with another village.

d Aniak, Chuathbaluk and Russian Mission.

e Sleetmute to Red Devil.

f Kashegelok and Holitna.

g Reported catch only.

h Estimate based on a sample of villages surveyed.

i Beginning in 1988, estimate based on new formula, data not comparable to previous years.

Appendix A.11. Kuskokwim Area subsistence sockeye salmon harvest by community, 1985 – 2002.

Community	1985	1986	1987	1988 ^c	1989	1990	1991	1992	1993	1994	1995
Kipnuk ^a					402	175	136		90	132	
Kwigillingok ^a								0	140	5	
Kongiganak	130			830	658	423	533	905	705	702	530
Tuntutuliak	1,498	288	991	600	1,173	1,954	1,768	1,894	955	3,185	1,134
Eek	241			336	170	1,177	489	671	406	461	283
Kasigluk	1,138			376	235	810	1,421	81	122	275	165
Nunapitchuk	1,447	905	1,187	884	1,026	1,098	2,277	2,273	2,545	1,555	882
Atmautluak	1,308			320	1,143	1,501	881	1,304	1,387	796	1,099
Napakiak	1,242		1,439	1,087	1,752	1,375	1,176	1,315	1,150	1,627	959
Napaskiak	1,181		2,199	1,120	721	1,227	2,673	2,428	3,495	1,933	1,605
Oscarville	942		438	1,752	404	153	711	35	932	324	414
Bethel	3,409	7,730	3,810	5,614	7,316	6,392	17,669	7,173	10,503	8,563	8,190
Kwethluk	5,584	5,423	3,845	5,190	2,414	4,055	3,723	1,829	3,790	3,742	2,504
Akiachak	3,182		3,532	4,890	2,420	3,176	4,123	3,095	4,545	3,323	2,019
Akiak	1,368		1,883	1,378	2,492	1,739	1,708	1,458	3,558	1,786	643
Tuluksak	1,620		1,733	1,493	2,314	1,120	3,595	2,034	2,492	1,393	1,244
Lower Kalskag	948	783		1,581	767	851	1,092	467	2,339	950	681
Upper Kalskag	187	1,182		345	338	287	276	333	349	298	55
Aniak	2,116	2,652	2,101	1,078	959	1,356	2,031	1,180	1,578	571	975
Chuathbaluk	1,797			44	215	1,178	1,246	471	823	995	472
Napaimute	125										
Crooked Creek	1,218			327	436	1,556	998	489	831	512	192
Red Devil	205			437	356	445	426	315	717	311	620
Sleetmute	1,351			898	776	1,060	1,164	855	1,609	1,158	1,083
Stony River	585			195	1,084	835	1,912	1,462	1,488	802	1,342
Lime Village					5,653	2,333	956	0	2,800	1,760	700
McGrath			0	0	0	0	0	0	0	0	0
Takotna			0	0	0	0	0	0	0	0	0
Nikolai			0	0	0	0	0	0	0	0	0
Telida				0	0			0			
Quinhagak	106	423	1,067	1,261	633	1,951	1,772	1,264	1,082	1,000	573
Goodnews Bay	562	860	834	898	710	970	1,132	669	784	669	219
Platinum	142	83	121	167	151	153	150	158	51	101	34
Mekoryuk ^a				1	0	50	1	0	1	87	
Newtok ^a					10	3	0		0	20	
Nightmute ^a					0	10	210			15	
Toksook Bay ^a					277	242	105	1	66	228	5
Tununak ^a					83	7	50		30	0	
Other ^a								1	1		
Total	33,632	20,239^b	25,180^b	33,102	37,088	39,662	56,404	34,159	51,363	39,279	28,622

-continued-

Appendix A.11. Continued (Page 2 of 2)

Community	1996	1997	1998	1999	2000	2001	2002
Kipnuk ^a			107	54	179	4	11
Kwigillingok ^a	10		125				
Kongiganak	722	1,128	888	991	1,789	1,460	793
Tuntutuliak	1,526	2,048	1,275	2,048	1,236	1,701	991
Eek	478	584	382	625	878	923	748
Kasigluk ^a	588	499	53	183	666	320	59
Nunapitchuk	1,735	2,330	2,250	3,493	2,111	2,583	1,422
Atmautluak	1,456	724	1,050	1,874	1,516	958	1,015
Napakiak	1,083	1,455	1,705	2,115	2,026	1,861	1,221
Napaskiak	2,446	2,329	1,617	2,058	2,611	3,428	1,292
Oscarville	212	78	288	2,165		1,620	377
Bethel	7,112	10,868	8,134	13,145	12,536	15,709	7,804
Kwethluk	4,035	3,581	4,036	3,112	3,685	3,960	2,126
Akiachak	2,607	3,014	2,654	3,130	3,597	4,300	2,534
Akiak	1,449	1,398	1,478	1,145	970	1,916	1,223
Tuluksak	1,075	1,558	1,490	1,490	2,207	1,759	1,055
Lower Kalskag	1,144	1,455	574	605	885	824	261
Upper Kalskag	294	251	245	614	636	304	485
Aniak	1,277	1,124	1,151	1,310	1,143	2,223	918
Chuathbaluk	661	881	248	460	515	537	365
Crooked Creek	304	350	716	690	505	476	413
Red Devil	977	697	346	568	107	361	105
Sleetmute	1,304	1,458	1,398	946	759	940	603
Stony River	1,218	1,607	433	1,230	266	138	460
Lime Village	500	660	2,782	2,550	918	1,516	
McGrath	0	20 ^d		74	42	244	329
Takotna	0	0		0	0	0	0
Nikolai	0	0		0	0	0	0
Telida							
Quinhagak	400	556	1,490	1,639	1,341	914	855
Goodnews Bay	411	472	483	770	1,028	921	794
Platinum ^a	7	137	25	102	177	53	256
Mekoryuk ^a	0		21	2	7		204
Newtok ^a					124		85
Nightmute ^a				5	71		
Toksook Bay ^a	5	8	101	193	253	12	32
Tununak ^a			20	0	48		8
Chefornak ^a			13				
Other							
Total	35,036	41,270	37,578	49,388	44,832	51,965	28,884

Blanks indicate missing data.

- a Reported harvest only.
- b Estimated total based on sampled villages.
- c Beginning in 1988, estimate based on new formula, data not comparable to previous years.
- d McGrath residents sometimes travel to areas downriver to harvest sockeye.

Appendix A.12. Kuskokwim Area subsistence Coho salmon harvest by community, 1985 - 2002.

Community	1985	1986	1987	1988 ^c	1989	1990	1991	1992	1993	1994	1995
Kipnuk ^a					200	460	30		25	185	
Kwigillingok ^a								0	80	0	
Kongiganak	88			1,146	562	413	540	544	502	566	605
Tuntutuliak	371	1,692	760	754	508	1,135	729	761	820	441	365
Eek	406			291	349	1,620	343	531	206	426	347
Kasigluk	1,763			906	772	958	1,769	174	228	387	518
Nunapitchuk	513	1,084	696	898	469	573	1,167	2,226	321	781	641
Atmautluak	326			337	971	350	254	518	426	411	566
Napakiak	836		959	588	1,757	1,700	597	1,237	590	920	390
Napaskiak	415		629	1,503	1,130	922	754	866	783	2,012	580
Oscarville	155		40	50	430	43	136	0		49	
Bethel	6,094	19,351	8,077	8,291	22,390	19,342	28,136	15,902	13,764	12,258	19,906
Kwethluk	3,041	3,545	2,537	5,240	3,736	3,928	2,380	2,325	1,838	1,816	1,304
Akiachak	967		286	7,927	1,890	1,621	2,393	2,108	1,351	1,531	677
Akiak	1,270		1,294	1,577	4,959	1,591	2,231	1,137	1,315	1,110	501
Tuluksak	1,723		337	1,537	1,483	946	1,903	1,544	412	285	531
Lower Kalskag	596	2,211		158	981	375	510	469	778	845	718
Upper Kalskag	105	759		136	688	300	493	931	354	184	167
Aniak	1,552	1,051	2,302	1,903	2,640	1,484	1,143	1,844	1,091	1,682	1,265
Chuathbaluk	393			72	272	813	93	349	366	795	84
Napaimute	211										
Crooked Creek	290			89	530	886	277	413	409	581	381
Red Devil	846			672	1,591	866	1,132	1,160	1,812	994	1,557
Sleetmute	1,330			1,776	1,009	1,023	1,557	1,132	880	649	1,075
Stony River	395			161	611	423	502	744	512	505	1,083
Lime Village				1,055	2,025	538	336	300	618	960	246
McGrath				790	537	2,408	882	2,780	1,989	2,558	2,225
Takotna					40	0	0	0	0	0	
Nikolai	550			530	328	73	83	173	267	119	545
Telida					60			0			
Quinhagak	67	41	125	4,317	3,787	4,174	3,232	2,958	2,152	2,739	2,561
Goodnews Bay	210			1,072	830	1,556	1,789	1,163	1,197	435	296
Platinum	11	8	43	90	77	90	39	190	29	77	9
Mekoryuk ^a					106	52	130	2	53	87	
Newtok ^a					15	4	0		0	0	
Nightmute ^a					70	0	20			0	
Toksook Bay ^a					35	46	1	15	57	116	22
Tununak ^a					9	0	0		70	0	
Other ^a							39				
Total	24,524	29,742^b	18,085^b	43,866	57,847	50,713	55,581	44,496	35,295	36,504	39,165

-continued-

Appendix A.12. Continued (Page 2 of 2)

Community	1996	1997	1998	1999	2000	2001	2002
Kipnuk ^a			85	75	223	74	69
Kwigillingok ^a	5		40				
Kongiganak	421	618	275	222	339	925	610
Tuntutuliak	1,339	669	935	331	3,435	337	1,178
Eek	389	80	306	258	488	207	904
Kasigluk ^a	368	518	140	92	1,667	344	142
Nunapitchuk	1,310	872	427	391	366	392	814
Atmautluak	537	531	425	205	224	369	591
Napakiak	600	168	749	487	502	644	587
Napaskiak	398	658	540	355	889	466	716
Oscarville	19	60	2	970		42	119
Bethel	12,929	15,108	11,294	12,414	13,794	14,949	13,802
Kwethluk	3,195	1,193	1,731	2,993	3,271	1,688	2,694
Akiachak	850	441	477	663	2,509	1,633	1,685
Akiak	972	846	674	254	483	564	1,141
Tuluksak	1,116	434	879	307	523	971	1,232
Lower Kalskag	1,022	652	347	302	428	539	256
Upper Kalskag	360	781	812	153	288	416	1,032
Aniak	2,671	1,494	1,308	1,418	1,922	1,906	2,776
Chuathbaluk	395	217	55	137	469	541	651
Crooked Creek	171	261	392	515	132	70	420
Red Devil	1,274	1,391	425	455	158	427	471
Sleetmute	846	419	301	226	552	452	689
Stony River	571	450	429	511	10	347	517
Lime Village	0	277	776	600	362	590	
McGrath	919	753	924	553	700	420	1,083
Takotna	0		3	0	21	26	20
Nikolai	64	141	113	117	31	165	105
Telida							
Quinhagak	1,467	1,264	1,702	2,021	1,088	1,525	1,099
Goodnews Bay	293	343	312	439	414	508	202
Platinum ^a	59	54	19	143	103	108	95
Mekoryuk ^a	3		178	64	78		114
Newtok ^a					64		
Nightmute ^a				0	2		
Toksook Bay ^a	135	21	97	83	112	16	74
Tununak ^a			60	0	23	25	49
Chefornak ^a			7				
Others							
Total	34,698	30,714	27,239	27,754	35,670	31,686	35,937

Blanks indicate missing data.

a Reported harvest only.

b Estimated total based on sampled villages.

c Beginning in 1988, estimate based on new formula, data not comparable to previous years.

Appendix S. 1. 2002 Kuskokwim Area Subsistence Salmon Harvest Calendar.

Subsistence Division, ADFG
 PO Box 1789
 Bethel, AK 99569-1789

May 2002
 Dear Subsistence Fishers:

Please write in the number of salmon that people in your household caught for subsistence. Include all subsistence salmon that were caught, including those you gave to others and those you may have caught for dog food. DO NOT include salmon that you sold when commercial fishing.

Our address is on the back of this calendar. When finished fishing, you can fold the calendar so that our return address is visible. DO NOT PUT POSTAGE ON THE CALENDAR WHEN YOU RETURN IT TO US. We have paid the postage. (1k)

Presorted Standard
 U.S. Postage Paid
 Fairbanks, AK
 Permit No. 88



MAY 2002

SUBSISTENCE SALMON CALENDAR

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	12	13	14	15	16	17	18
TARYAQVAK =	King _____						
IQALLUK =	Chum _____						
SAYAK =	Sockeye _____						
	19	20	21	22	23	24	25
CHINOOK =	King _____						
	Chum _____						
"RED SALMON" =	Sockeye _____						
	26	27	28	29	30	31	
	King _____						
	Chum _____						
	Sockeye _____						

JUNE 2002

SUBSISTENCE SALMON CALENDAR

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
							1
	This is the second year of the subsistence salmon fishing schedule in the Kuskokwim River and salmon tributaries. The purpose of the schedule during June and July is to allow for pulses of salmon to pass upstream to spawning areas and to spread subsistence harvest opportunity throughout the drainage. The schedule is required by the Kuskokwim River Salmon Rebuilding Management Plan, adopted by the Alaska Board of Fisheries. The days of the week open and closed to salmon fishing were determined after consultation with communities along the Kuskokwim River drainage.						King _____
							Chum _____
							Sockeye _____
	2	3	4	5	6	7	8
TARYAQVAK =	King _____	King _____	King _____	King _____	King _____	King _____	King _____
IQALLUK =	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____
SAYAK =	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____
	9	10	11	12	13	14	15
CHINOOK =	King _____	King _____	King _____	King _____	King _____	King _____	King _____
	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____
"RED SALMON" =	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____
	16	17	18	19	20	21	22
	King _____	King _____	King _____	King _____	King _____	King _____	King _____
	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____
	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____
	23	24	25	26	27	28	29
	King _____	King _____	King _____	King _____	King _____	King _____	King _____
	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____	Chum _____
	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____	Sockeye _____
	30	Way back when..... * Fishing on the Kuskokwim River is carried on by fishwheels and set nets. Set net operators can utilize nets from 25 to 30 fathoms on all the downriver area where the tide ebbs and flows. Further upriver, fishwheels are placed on exposed points where the salmon crowd the meandering line of the stream. U.S. Bureau of Fisheries, 1922.					
	King _____						
	Chum _____						
	Sockeye _____						

Appendix S. 2. 2002 Kuskokwim Area Subsistence Salmon Harvest Survey Form.

COMM. ID# _____

Division of Subsistence, Bethel
 Chinook= "taryaqvak," Chum= "iqalluk," Sockeye= "sayak," Coho= "qakiiyaq" **HHID#** _____

**KUSKOKWIM AREA 2002
 POST-SEASON SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY**
 * (Questions marked with an asterisk are asked of all households interviewed) lk

Community: _____ Household Head Name: _____
 Survey Date: 10 11 _____, 2002 Name of Person Interviewed: HH, _____
 Interviewer: SM _____ CB _____ Household P.O. Box: _____
 Was this household in community last year?: No ___ Yes ___

***1. Did this household catch salmon for subsistence use this year?** No ___ (go to # 3) Yes ___

2. May I have your salmon calendar? (If household fished without using calendar, go to # 7)
 Picked up by interviewer _____ (go to # 10) Mailed it to ADFG _____ Didn't get one _____
 Didn't use _____ Lost or unavailable _____

***3. Does this household usually subsistence fish for salmon?** No ___ Yes ___

HOUSEHOLD DIDN'T FISH (Household was not involved in harvesting/catching salmon)

4. Did this household help another household process ("put up") salmon?
 No _____ (go to # 17) Yes _____: (Names, HHIDs) _____

5. Please estimate how many salmon all of you processed ("put up").
 CHINOOK _____ CHUM _____ SOCKEYE _____ COHO _____ Could not estimate _____
 ("kings") ("dogs") ("reds") ("silvers")

6. Please estimate how many salmon were for your household only.
 CHINOOK _____ CHUM _____ SOCKEYE _____ COHO _____
 ("kings") ("dogs") ("reds") ("silvers")

(Go to Question 17)

HOUSEHOLD FISHED, ADF&G DOES NOT HAVE CALENDAR

7. Did other households fish with you? No ___ Yes ___: (Names, HHIDs) _____

8. Please estimate how many salmon your household (or all households together) caught.
 (Ask about Coho salmon and also salmon already eaten, frozen, given to other households, sent to friends, and dog food)
 CHINOOK _____ CHUM _____ SOCKEYE _____ COHO _____ Salmon are included with Households....
 ("kings") ("dogs") ("reds") ("silvers")

9. Please estimate how many salmon were for your household only.
 CHINOOK _____ CHUM _____ SOCKEYE _____ COHO _____ ALL _____ PERCENT _____
 ("kings") ("dogs") ("reds") ("silvers")

(Go to Question 15)

HOUSEHOLD FISHED, ADF&G DOES HAVE CALENDAR

10. Are all of the salmon this household caught written on the calendar? No ___ Yes ___
 (Ask about Coho salmon and also salmon already eaten, frozen, given to other households, sent to friends, and dog food)

11. How many additional salmon, not written on the calendar, were caught?
 CHINOOK _____ CHUM _____ SOCKEYE _____ COHO _____
 ("kings") ("dogs") ("reds") ("silvers")

12. Did other households fish with you? No ___ (go to # 15) Yes ___: (Names, HHIDs)

(This Block is continued on back side) COFFING, ADFG Sep 2002

Appendix S. 3. 2002 Kuskokwim Area Subsistence Salmon Harvest Survey Postcard.

Dear Kuskokwim Area Resident,

Please take a moment to answer the questions on the back side of this card and drop it in the mail to us. No stamp is necessary, postage is already paid. We will mail you a subsistence salmon harvest summary in Spring after the survey data is compiled.

We appreciate your help to document subsistence salmon harvests. We use this information to help the Board of Fisheries and the Department of Fish and Game make informed management decisions affecting the Kuskokwim Area. Your household harvest information remains confidential. Please call if you have any questions.

Thank you,

Subsistence Division
Room 214, BNC Complex
Bethel (543-3100)

(correct your address if necessary)
NAME: _____
P.O. BOX: _____
CITY, STATE: _____
ZIPCODE: _____

Did your household harvest salmon for subsistence use this year?
(include any salmon kept for subsistence when commercial fishing) Yes___ No___

How many subsistence salmon did your household harvest?
(include salmon eaten, given away, frozen, dried, smoked, canned, or for dogfood)

Chinook _____ Chum _____ Sockeye _____ Coho _____
(King salmon) (Dog salmon) (Red salmon) (Silver salmon)

What type(s) of gear did your household use to catch subsistence salmon ?
Set net _____ Drift net _____ Fishwheel _____ Rod and reel _____

How was subsistence salmon fishing for your household this year?

King: Very good Average Poor, If Poor, why _____
Sockeye: Very good Average Poor, If Poor, why _____
Chum: Very good Average Poor, If Poor, why _____
Coho: Very good Average Poor, If Poor, why _____

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