

**Lower Yukon Large Land Mammal Subsistence Harvest Survey:
The 2009-2010 Harvest of Moose, Caribou, Muskox, Bear, Wolverine, and
Wolf in Nine Lower Yukon Communities, Alaska**

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Abstract

Residents of the lower Yukon River drainage in western Alaska rely on large land mammal species as important components of their seasonal round of harvesting wild resources for subsistence. Reliable and accurate harvest estimates aid in management of these resources. Households in nine lower Yukon River drainage communities participated in this project to document their harvest and use of moose, caribou, muskox, brown bear, black bear, wolverine, and wolf during a one year study period from February 1, 2009, to January 31, 2010. Out of a combined total 896 households in Alakanuk, Chevak, Kotlik, Marshall, Mountain Village, Nunam Iqua, Russian Mission, Saint Marys, and Scammon Bay, 401 households (45 percent) were randomly selected and interviewed during house to house visits using a questionnaire.

Study findings indicate that an estimated 549 moose, 25 caribou, 28 black bear, no brown bear, 2 muskox, 2 wolverine, and 35 wolves were harvested during the study year by residents of the nine communities. For moose, hunter effort was particularly high compared to hunting effort for other large land mammals, which occurred at lower levels. For some species, such as caribou and muskox, residents in the nine communities generally had to travel extensive distances to harvest. Other species, such as wolverine, brown bear, and muskox, may not be abundant in the lower Yukon area; harvests were infrequent. For moose, mapping methods were used to document the hunting areas used and harvest sites of moose during the study year. Areas used to hunt moose during the year 2000 were also documented. In 2000 more hunters travelled further from home to hunt for moose, to areas such as Unit 21E. Few hunters said they stayed close to their communities to hunt. Between February 2009 and January 2010, hunters stayed in a more concentrated area near the study communities and fewer hunted in Unit 21E. These findings reflect an increase in the local moose population.

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Introduction

Large land mammals are important resources for the residents of the lower Yukon River drainage in western Alaska. Reliable and accurate harvest estimates aid in management of these resources. The overall goal of this project was to document the harvest and use of large land mammals during a one year study period, February 1, 2009, to January 31, 2010, by residents of nine lower Yukon communities located in wildlife management Unit 18: Alakanuk, Chevak, Kotlik, Marshall, Mountain Village, Nunam Iqua, Russian Mission, Saint Marys, and Scammon Bay (See Figure 1). Residents were asked about their harvest and use of moose (*Alces alces*), caribou

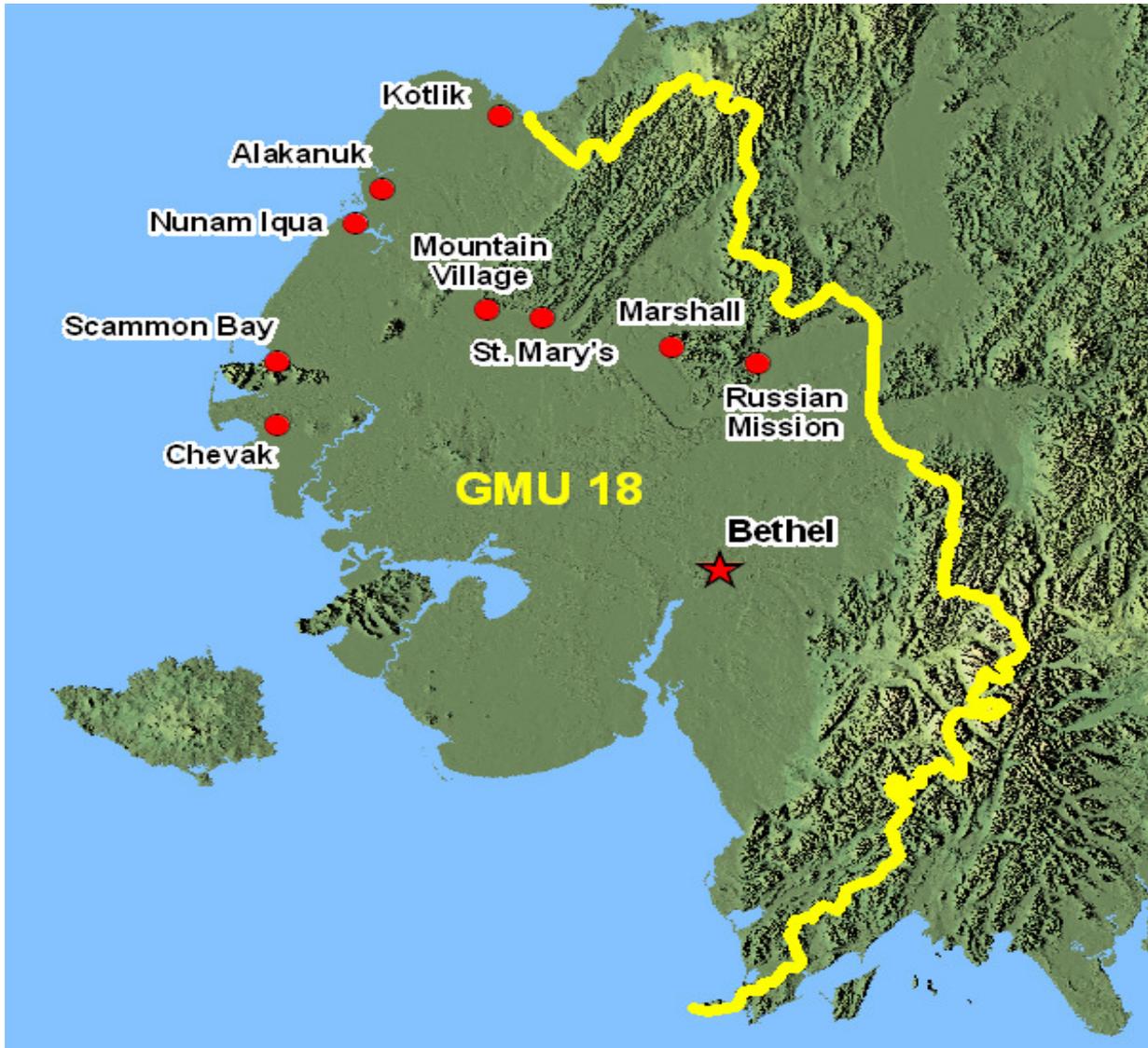


Figure 1. Management Unit 18 and the nine Lower Yukon study communities.

Note: Bethel was not surveyed as part of this study.

(*Rangifer tarandus*), muskox (*Ovibos moschatus*), brown bear (*Ursus arctos*), black bear (*Ursus americanus*), wolverine (*Gulo gulo*), and wolf (*Canis lupus*).

In the lower Yukon River drainage, only residents of Russian Mission have previously participated in a systematic harvest survey that included large land mammals (Pete 1991). A study by Robert Wolfe (1981) provided some baseline harvest data for the communities of Alakanuk, Nunam Iqua (Sheldon Point), Kotlik, Mountain Village, Emmonak, and Stebbins. However, the interviewed sample was not representative and results could not be expanded across entire populations. Communities along the middle and upper river have participated in multiple harvest surveys for large land mammals (Brown and Koster 1995; Brown et al. 2004a, 2004b; Anderson, Brown, Walker, and Jennings 2004; Anderson, Utermohle, and Brown 2000; and Anderson, Utermohle, and Jennings 2001).

Emmonak was not included in the present study because the residents participated in a baseline harvest survey of all wild resources harvested for home use for a one year study period in 2009 and 2010, funded by the North Pacific Research Board as part of the Bering Sea Integrated Research Program. Research included recording traditional knowledge (Simon 2010). The communities located in the lower Yukon River drainage that participated in the present research have subsistence-based economies; resource uses have been described in Fienup-Riordan (1986) and Pete (1991). Residents of the study communities are primarily Yup'ik Eskimos related culturally and through language with residents of the lower Kuskokwim drainage and Bristol Bay.

In the area of these communities, as in much of rural Alaska, household surveys tend to provide a more accurate accounting of harvests than do returned harvest tickets or other methods of harvest assessment (See Andersen and Alexander 1992). Therefore, the U.S. Fish and Wildlife Service, Office of Subsistence Management, provided the funds to complete these collaborative, community-based harvest surveys.

Regulatory Context

Regulatory moose hunting seasons in the lower Yukon River drainage, located in Unit 18, from 1961 to 1988 varied over the years with a harvest limit of one bull moose. From 1988 through 1994, the State instituted a moratorium on moose hunting in the Yukon River drainage below Mountain Village due to low numbers of moose. In 1995, the moratorium was lifted by the State Board of Game; however, the Federal Subsistence Board closed federal public lands to the hunting of moose except by federally qualified subsistence users: residents of Unit 18, residents of St. Michael and Stebbins in Unit 22, and residents of Upper Kalskag in Unit 19A. The majority of the land in Unit 18 is within the boundary of the Yukon Delta National Wildlife Refuge and is federal public land. In 2009, the Federal Subsistence Board re-opened federal public lands to other uses, maintaining that the Unit 18 closure was no longer biologically warranted (FWS 2007). The moose population in the lower Yukon River drainage has increased from virtually no moose in the early 1980s to an estimated population of nearly 3,000 moose, based on 2009 composition surveys (Wald 2010).

In moose hunting regulations, provisions for the lower Yukon River drainage below Mountain Village are described. During the study period the moose season and harvest limit in this area were:

Unit 18 Below Mountain Village—Feb. 1, 2009–Jan. 30, 2010			
State Regulations		Federal Regulations	
Season	Harvest Limit	Season	Harvest Limit
Aug. 10–Sept. 30	One antlered bull or one calf	Aug. 10–Sept. 30	One antlered bull
Dec. 20–Jan. 20*	One antlered bull or one calf	Dec. 20–Jan. 20*	One moose

* In January 2009, the moose season was temporarily extended through February 2009, into the study period.

Unit 18 above Mountain Village is in the “remainder area” of Unit 18 in moose hunting regulations. During the study period the moose season and harvest limit in this area were:

Unit 18 Above Mountain Village—Feb. 1, 2009–Jan. 30, 2010			
State Regulations		Federal Regulations	
Season	Harvest Limit	Season	Harvest Limit
Aug. 10–Sept. 30	One antlered bull	Aug. 10–Sept. 30	One antlered bull
Dec. 20–Jan. 10	One antlered bull	Dec. 20–Jan. 10	One antlered bull

During the study year in the area of the study communities, the state and federal hunting regulations for caribou, black bear, brown bear, muskox, wolverine, and wolf were:

Unit 18—Feb. 1, 2009–Jan. 30, 2010				
	State Regulations		Federal Regulations	
Resource	Season	Harvest Limit	Season	Harvest Limit
Caribou	Aug. 1–Mar. 15	2 caribou*	Aug. 1–Mar. 15	3 caribou**
Black bear	July 1–June 30	3 bear	July 1–June 30	3 bear
Brown bear	Sept. 1–May 31	1 bear	Sept. 1–May 31	1 bear
Muskox	Feb. 1–Mar. 25	1 muskox (Nelson Island)	No open season	
Wolverine	Sept. 1–Mar. 31	1 wolverine	Sept. 1–Mar. 31	1 wolverine
trapping	Nov. 10–Mar. 31	No limit	Nov. 10–Mar. 31	No limit
Wolf	Aug. 10–Apr. 30	5 wolves	Aug. 10–Apr. 30	5 wolves
trapping	Nov. 10–Mar. 31	No limit	Nov. 10–Mar. 31	No limit

* No more than 1 bull may be taken, and only 1 caribou may be taken from Aug. 1–Jan 31.

** No more than 1 caribou may be taken from Aug. 1–Nov. 30.

Goals and Objectives

The goal of this project was to develop a quantitative measure of the total harvest of moose, caribou, muskox, brown bear, black bear, wolverine, and wolf, with moose being the primary focus. Nine lower Yukon drainage communities participated in the project. Growth of local moose populations was expected to affect how area residents hunt for moose and travel patterns associated with attempting to harvest moose.

The objectives of the project were to describe:

- The number of people in each household and in each community;
- The number of hunters in each household and in each community;
- The number of successful hunters in each household and in each community;
- The number of days each hunter spent hunting moose;
- The number of days each successful hunter spent hunting moose;
- The number of moose, caribou, muskox, brown bear, black bear, wolverine, and wolf harvested by each household and by each community in number of animals and pounds usable weight;
- The number of households using, attempting to harvest, harvesting, giving, and receiving from another household moose, caribou, muskox, brown bear, black bear, wolverine, and wolf; and
- Historical and current locations where household members attempted to harvest moose.

Methods

The Questionnaire

The primary method used to conduct this research was a face to face harvest survey conducted with at least one member of each household that was interviewed. A survey instrument, or questionnaire, was developed similar to the instrument used to conduct surveys in the middle and upper Yukon River communities, research that was mentioned above. The questionnaire included questions concerning the harvest and use of moose, caribou, muskox, brown bear, black bear, wolverine, and wolf from February 1, 2009, to January 31, 2010 (Appendix 1).

Specific information recorded on the survey questionnaires included:

- The number of people in each household;
- The number of hunters in each household;
- The number of days each hunter spent hunting moose; and
- The number of moose, caribou, bear, muskox, wolverine, and wolf harvested by the household.

Information in the survey questionnaire also included:

- The use, attempt to harvest, and harvesting of moose, caribou, muskox, brown bear, black bear, wolverine, and wolf by members of the household; and

- The giving and receiving of moose, caribou, muskox, brown bear, black bear, wolverine, and wolf from one household to another.

The questionnaire was designed to record quantitative data. Many of the questions on the survey contained dichotomous variables, such as a yes or no response. Other questions required a numeric response, such as the number of people living in the household, the number of hunters in the household, days spent hunting, and the number of animals harvested. The questions were designed to elicit clear responses to eliminate ambiguity and the potential for errors in interpreting responses. In some cases, there was no response to some questions. The reasons include: the question was not asked, the participant declined to answer the question, or the response to the question was otherwise not recorded. To address question non-response, a coded response in the database was used that corresponds to the type of missing variable.

Mapping Subsistence Harvest and Use Areas for Moose

The questionnaire included a mapping component. To identify moose hunting and harvest locations for each interviewed household, subsistence use area mapping methods were used. Use area mapping is the process of documenting the areas used to hunt and harvest wild resources in subsistence socio-economic systems (See Ellanna et al. 1985). Subsistence mapping is a process whereby the interviewer asks the respondent to identify areas on a map where anyone in the household hunted or harvested wild resources, in this case moose.

First, interviewers in each community used USGS topographical maps showing all of Unit 18 and portions of Units 19A, 21E, and 22A, meant to encompass hunting areas most likely to be used by the residents of surveyed communities. A clear overlay showing federal/non-federal land status and another overlay with ADF&G's "uniform coding units" (UCUs) were placed over the topographical maps. A member of each interviewed household was asked to identify where anyone in the household attempted to harvest moose during the study year, February 1, 2009–January 31, 2010. Households were placed in one of three categories, households hunting only on federal land during the study year, households hunting only on non-federal land during the study year, and households hunting on both federal and non-federal land during the study year. This mapping method gives a rough estimate of the intensity of use of federal lands by hunters in the study communities.

In addition to federal and non-federal land descriptors, UCUs were used to describe areas used to hunt moose by each interviewed household. This mapping method measures the intensity of moose hunting in subdrainages (defined by UCUs) of the lower Yukon River drainage by hunters in the study communities.

The mapping activity was directly followed by another. During this activity, respondents were asked to indicate the same information with the only difference being the study year. The year 2000 was chosen because in discussions with area wildlife biologists it became clear that this year was the most recent period when moose populations were not as high in the region, while still being recent enough to allow for recall of hunting locations. The addition of this mapping method allowed investigators to measure changes in intensity of use on federal land and changes in intensity of use in various areas defined by UCUs.

Finally, interviewers asked where moose had been harvested. Interviewers in each community used the same USGS topographical maps showing Unit 18 and portions of Units 19A, 21E, and 22A, and a clear overlay was placed over the topographical maps. The overlay displayed once again UCU boundaries. Survey participants were asked to indicate the UCUs in which members of their households harvested moose during the study year, February 1, 2009–January 31, 2010. Because harvest locations were to be reported by UCU, more precise harvest locations were not recorded. This mapping method measures the intensity of moose harvest in different areas.

In the community of Nunam Iqua, SWCA utilized a laptop computer to record subsistence mapping information as a test case for new research methods in gathering subsistence moose use and harvest information. Respondents were asked to identify on the computer screen both year 2000 and current moose hunting areas, as well as locations of moose harvest between February 1, 2009 and January 31, 2010.

Survey Goals and Participation

The number of households in the nine communities varied between 35 (Nunam Iqua) and 183 (Mountain Village), based on the 2000 U.S. Census (See Table 1). A modified proportion sample size estimator for each community was used to determine sample size. Sample sizes meeting a 95% confidence level with a confidence interval of +/- 10% were attempted. Using that assumption yielded a proposed sample size of for each community as follows:

Table 1. Sample size estimations for each study community (using year 2000 census data).			
Community	Population	Number of Households	Sample Size
Alakanuk	652	139	57
Chevak	765	167	61
Kotlik	591	117	53
Marshall	349	91	47
Mountain Village	755	183	63
Nunam Iqua	164	35	26
Russian Mission	296	70	41
Saint Marys	500	137	57
Scammon Bay	465	96	48
Totals	4,537	1,035	453

Table 2. Survey Sampling and Participation Summary.

Community	Total Number of Households ¹	Number of Surveyed Households ²	Percent of Households Sampled	Declined Survey	Sampled Household Population	Estimated Community Population	Sampled Household Population
All	896	401	44.8%	89	1,918	4,543	4.78
Alakanuk	117	64	54.70%	5	282	516	4.41
Chevak	167	64	38.32%	4	350	913	5.47
Kotlik	97	49	50.52%	9	252	499	5.14
Marshall	74	49	66.22%	8	181	273	3.69
Mountain Village	141	63	44.68%	2	288	645	4.57
Nunam Iqua	34	13	38.24%	21	68	178	5.23
Russian Mission	67	43	64.18%	1	201	313	4.67
Saint Marys	119	9	7.56%	28	61	807	6.78
Scammon Bay	80	47	58.75%	11	235	400	5.00

¹ The total number of households in Alakanuk, Kotlik, Marshall, Mountain Village, Russian Mission, Saint Marys, and Scammon Bay was based on subsistence salmon harvest surveys conducted in September and October 2009 (Jallen 2010). The total number of households in Nunam Iqua was based on observations made during this research.

² Type of sample: Census in Nunam Iqua; random in the remaining communities.

Participation in the survey by households in each of the nine communities can be seen in Table 2. The total number of households in each community is based on subsistence salmon harvest surveys conducted in September and October 2009 (Jallen 2010), except the total number of households in Nunam Iqua is based on observations made during this research. The combined total number of households in the communities had dropped from 1,035 households in 2000 (U.S. Census 2010) to 896 households in 2009 (Jallen 2010). Concerning the selection of the samples, the households that completed the survey were randomly selected, except in Nunam Iqua where a survey of all households, a census sample, was attempted. Out of a combined total of 896 households in the nine communities, 401 were interviewed (45 percent). Eighty-nine households were randomly selected but declined to be interviewed. This included almost two thirds of the households in Nunam Iqua and almost of a quarter of the households in Saint Marys. An estimated 4,543 people were living in the nine communities during the study period. Estimated household sizes ranged from 3.7 people per household in Marshall to 6.8 in Saint Marys.

The harvest surveys in the majority of the study communities were completed in a timely manner, requiring two to three months, from February 2010 to May 2010. The harvest survey in Nunam Iqua was completed with only 13 interviewed households (38 percent) after interviewers ascertained that no more households would consent to be interviewed. The reason for this is not clear, but probably had to do with the high level of community involvement with winter

activities; people were busy. In Saint Marys, nine households were interviewed, about 8 percent of the households in the community, and well below the goal of 57 (See Table 1). Researchers found it difficult to contact and train interviewers that were qualified and interested in participating in the project, even though the tribal council and community leaders were in support of the project. After initially hiring and training two interviewers in February, a researcher travelled to the community in fall 2010 in an attempt to contact and hire additional interviewers to complete the survey. The researcher found little interest in prospective interviewers in this type of work, and additional attempts to complete the survey in Saint Marys were not made.

Approach to the Survey

At the beginning of the project, tribal and other government leaders in each study community were contacted and informed of the project and approval was sought to conduct research in their communities. In addition, researchers asked the community leaders for names of community members to be hired for collection of survey data in each community.

While visiting the communities, researchers met with the potential candidates to conduct the interviews. They then selected and trained the best candidates. Hiring preference was given to prospective interviewers who were fluent in both Yup'ik and English. Local interviewers were familiar with the communities, usually spoke Yup'ik, and therefore, were able to interview those residents who spoke Yup'ik as their first language or who were non-English speakers.

A map of households developed by the Alaska Division of Community and Economic Development was used to identify households prior to initiating the survey in each community. From that list, a random number generator or table was used to determine which residences to approach as potential participants in the survey.

Interviews generally took place in the respondent's home, but depending on the respondent's availability, they sometimes occurred at other locations within the community, such as an elder center or community center. All interviews were voluntary and occurred on a one-on-one basis to ensure confidentiality about preferred harvesting locations. In the documentation and reporting of survey data, no names of participants were used and no raw data was viewed by anyone other than the researchers. To protect confidential information, no specific locations (lower scale than UCU level) where moose were harvested were identified on maps or in text of the draft and final reports. These efforts to protect confidentiality are required in the ethical standards for the conduct of research in the Arctic and to protect sensitive harvesting information (See ANKN 2010).

After completing each household interview, community interviewers reviewed the data to ensure there were no missing responses. The interviewers then created a copy of the completed questionnaire. At the completion of the community survey efforts, the community interviewers sent the copies of the completed interviews to SWCA's Anchorage office. Approximately one week later, the originals were sent to SWCA's Anchorage office. This effort was to ensure the data, either as copies or the original forms, would arrive for entry into the database. Once the copies and originals arrived to the Anchorage office, both versions were compared for

inconsistencies. If any inconsistencies were noted, deference was given to the original questionnaire.

Data Analysis

The completed forms were then entered into an Excel database, with separate columns created for each variable. Entries were coded using the protocol developed by the ADF&G for the Exxon Valdez Oil Spill community subsistence surveys (See Fall 2006). Once all entries were coded and entered into the database, the excel database was then transferred to a database for the Statistical Package for the Social Sciences (SPSS Version 16.0). The two databases were then compared and if any discrepancies were noted, they were checked against the original questionnaire and corrected.

Data were analyzed using SPSS Version 16.0. Harvest data for all large land mammals was extrapolated to all households and community populations (See Table 2, Survey sampling and participation summary).

Per household and per capita pounds of harvest were derived using conversion factors for each of the seven large land mammal species. Conversion factors were estimated usable weights of a given species, taking into account the sex, age, and size of the animal, as well as traditional uses. For this study, the conversion factors for each species were derived from recent household harvest studies in nearby areas, including the Brown and Koster (2005) study in the middle Yukon River drainage communities and the conversion factor database in the ADF&G Community Subsistence Information System (ADF&G 2010). Researchers then conferred with federal and state area biologists to ensure the conversion factors were appropriate for the lower Yukon area. The following are the conversion factors used in this study by species. Wolverine and wolf have a conversion factor of 0 because they are primarily used for fur and not eaten. Therefore, no estimates of per household and per capita pounds of harvest were calculated in the findings.

- Moose = 750 pounds of useable weight
- Caribou = 130 pounds of useable weight
- Black Bear = 100 pounds of useable weight
- Brown Bear = 141 pounds of useable weight
- Muskox = 593 pounds of useable weight
- Wolverine = 0 pounds of useable weight
- Wolf = 0 pounds of useable weight

Limitations of the Data

Due to the high level of variability in harvest levels between households where key harvesters supply much of the communities' harvests, and because census samples were not attempted due the large community sizes, the confidence interval goal of +/-10% was not achieved in every community for every large land mammal species on the harvest survey. The findings from the survey in Saint Marys are particularly broad, as only nine households out of 119 were

interviewed (about 8 percent). The results of the survey with residents of Saint Marys, however, do provide a minimum estimate of the harvest and use levels of species on the survey.

It should be noted that the harvest of wild resources for subsistence generally varies from year to year based on weather, regulations, populations of resources, and other factors. These findings present a one-year snapshot of harvesting patterns in the study communities.

Study Results

Moose

Moose are the most widely harvested large land mammal in all surveyed communities in the lower Yukon region. Table 3 shows the levels of participation in hunting and use of moose in the study communities.

Table 3 shows that the majority of households, at least 70 percent, in each community reported using moose during the study year, February 2009–January 2010, except Chevak where only 28 percent of households reported using moose. The majority of households, over 56 percent, in each community hunted moose, except for Chevak where only 28 percent of households hunted moose. Over 38 percent of households in each community harvested moose, except Chevak where only 14 percent of households harvested moose. There was a high level of sharing moose in each study community with at least 63 percent of households receiving moose and 31 percent of households giving moose to another household during the study year.

The nine study communities harvested an estimated total 549 moose during the study year (Table 3). The estimated harvest of moose ranged from a high of 119 in Saint Marys to a low of 18 in Nunam Iqua. However, the estimate for Saint Marys is based on a small sample size, only 8 percent of households were interviewed, and therefore, characterizing the lower end of the estimate, 47 moose, shown on Table 3, as the minimum harvest level is more accurate. With this adjustment, the community with the highest estimated moose harvest is Mountain Village at 110 moose. Taking into account the varying population sizes of the communities, the highest rate of harvest was 0.17 moose per person in Mountain Village and the lowest rate was 0.03 moose per person in Chevak. This equals to a high of 128 pounds of moose per capita in Mountain Village and a low of 24 pounds of moose per capita in Chevak for the study year.

Table 3. Levels of Participation in the Use and Harvest of Moose February 2009 - January 2010.

Community	Participation of Households					Sample Harvest	Estimated Harvest Levels							
	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)		Estimated Harvest	95% Confidence Limit of Estimated Total Harvest		Per		Pounds per capita	95% Confidence Limit of Estimated pounds per capita	
								Low	High	Household	capita		Low	High
All						234	549							
Alakanuk	93.8	56.2	42.2	78.1	54.7	35	64	49	79	0.55	0.12	93	72	115
Chevak	28.1	28.1	14.1	68.8	31.2	11	29	14	44	0.17	0.03	24	11	36
Kotlik	93.9	71.4	53.1	63.3	49.0	36	71	55	88	0.73	0.14	107	83	132
Marshall	98.0	77.6	42.9	79.6	32.7	29	44	33	54	0.59	0.16	120	92	149
Mountain Village	98.4	85.7	63.5	82.5	77.8	49	110	91	128	0.78	0.17	128	106	149
Nunam Iqua	100.0	69.2	38.5	100.0	61.5	7	18	7	32	0.54	0.10	77	18	136
Russian Mission	97.7	86.0	58.1	81.4	65.1	33	51	41	61	0.77	0.16	123	99	147
Saint Marys	88.9	88.9	77.8	77.8	87.5	9	119	47	191	1.00	0.15	111	44	178
Scammon Bay	70.2	57.4	42.6	70.2	46.8	25	43	31	54	0.53	0.11	80	59	101

Key
Use = Used Moose
Att = Attempted to Harvest Moose
Hrv = Harvested Moose
Rec = Received Moose
Gav = Gave Moose

An estimated 1,047 residents of the study communities hunted for moose during the study year (Table 4). The highest community participation estimates were in Marshall where 34 percent of the residents hunted for moose, followed by 32 percent in Mountain Village and Russian Mission. In all communities except Chevak, at least 18 percent of residents hunted for moose. In Chevak, only seven percent of residents hunted for moose. The harvest per hunter in all communities was at least 0.4 (almost a half) moose. Successful hunters harvested at least one moose per hunter.

Table 5 shows the amount of effort hunters spent on harvesting moose. The 1,047 hunters spent a cumulative total of 11,122 days hunting, or approximately 10.6 hunting days per hunter. Mountain Village hunters spent the highest number of days in the field (14.8 days per hunter), while Nunam Iqua hunters averaged only 3.9 days moose hunting. Successful hunters spent more time hunting, averaging 15.5 days per hunter. Across all study communities, approximately 15.1 days were spent hunting for every successful moose harvest. Again, Mountain Village had the highest number of days hunting per successful hunter at 23.3 days and Nunam Iqua had the lowest number of days per successful hunter at 6.1 days.

Table 6 and Figure 2 show the estimated moose harvest by sex and month. By far the vast majority of harvested animals were taken in September. The next highest month was August, followed by January, December, February, October, and November. No moose were harvested between March and July. The month of harvest for four moose was not known. Hunters harvested bull moose in much greater quantities than cow moose, with 477 bulls harvested out of the estimated 546 moose harvest. Approximately 34 cow moose were harvested in the study communities and 35 moose were harvested where the sex was not identified.

Table 4. Hunter Information							
Community	Estimated Total Hunters				Estimated Successful Hunters *		
	Sample	Estimate	% of Pop	Harvest per Hunter	Sample	Estimate	Harvest per Hunter
All	440	1047			230	540	
Alakanuk	56	102	19.9	0.6	35	64	1.0
Chevak	26	68	7.4	0.4	10	26	1.1
Kotlik	64	127	25.4	0.6	36	71	1.0
Marshall	62	94	34.3	0.5	27	41	1.1
Mountain Village	93	208	32.3	0.5	48	107	1.0
Nunam Iqua	15	39	22.1	0.5	7	18	1.0
Russian Mission	64	100	31.8	0.5	33	51	1.0
Saint Marys	18	238	29.5	0.5	9	119	1.0
Scammon Bay	42	71	17.9	0.6	25	43	1.0

* Number of successful harvesters based on number of moose harvested. Only one hunter per household is counted for each moose.

Table 5. Moose Hunting Effort in Surveyed Communities, February 2009 - January 2010.

Community	Total Moose Harvested	Estimated Total Hunters				Estimated Successful (Harvesting) Households			
		Estimated Total Number of Hunters	Mean Number of Hunters (per household?)	Days Hunted	Hunting Days per Hunter	Estimated Number of Successful Hunters	Days Hunted	Hunting Days per Hunter	Hunting Days per Moose Harvested
All	549	1,047		11,122	10.6	777	8,275	10.6	15.1
Alakanuk	64	102	1.6	1,464	14.4	84	1,175	14.0	18.4
Chevak	29	68	1.5	391	5.8	37	183	4.9	6.4
Kotlik	71	127	1.8	1,837	14.5	101	1,421	14.1	19.9
Marshall	44	94	1.7	897	9.5	50	603	12.1	13.8
Mountain Village	110	208	1.8	3,082	14.8	152	2,556	16.8	23.3
Nunam Iqua	18	39	1.7	152	3.9	24	112	4.7	6.1
Russian Mission	51	100	1.7	1,141	11.4	75	968	12.9	18.8
Saint Marys	119	238	2.3	1,719	7.2	198	886	4.5	7.4
Scammon Bay	43	71	1.6	439	6.2	56	371	6.6	8.7

Table 6. Estimated Moose Harvest by Sex and Month, February 2009 - January 2010.

Community	Sex	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Total
All	All	23	0	0	0	0	0	60	379	4	2	26	48	4	546
	Female	11	0	0	0	0	0	0	2	0	0	15	6	0	34
	Male	10	0	0	0	0	0	60	344	4	2	11	42	4	477
	Unknown	2	0	0	0	0	0	0	33	0	0	0	0	0	35
Alakanuk	All	2	0	0	0	0	0	2	55	0	0	4	2	0	65
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	2	0	0	0	0	0	2	48	0	0	4	2	0	58
	Unknown	0	0	0	0	0	0	0	7	0	0	0	0	0	7
Chevak	All	6	0	0	0	0	0	0	23	0	0	0	0	0	29
	Female	3	0	0	0	0	0	0	0	0	0	0	0	0	3
	Male	3	0	0	0	0	0	0	23	0	0	0	0	0	26
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kotlik	All	0	0	0	0	0	0	16	53	0	0	0	2	0	71
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	16	53	0	0	0	2	0	71
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marshall	All	0	0	0	0	0	0	12	23	2	0	5	4	0	46
	Female	0	0	0	0	0	0	0	0	0	0	0	2	0	2
	Male	0	0	0	0	0	0	12	23	2	0	5	2	0	44
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mountain Village	All	2	0	0	0	0	0	16	76	0	0	2	8	4	108
	Female	0	0	0	0	0	0	0	2	0	0	2	4	0	8
	Male	2	0	0	0	0	0	16	74	0	0	0	4	4	100
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nunam Iqua	All	0	0	0	0	0	0	0	7	2	0	0	4	0	13
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	7	2	0	0	4	0	13
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 6. Estimated Moose Harvest by Sex and Month, February 2009 - January 2010 (continued)

Community	Sex	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Total
Russian Mission	All	13	0	0	0	0	0	2	38	0	0	0	0	0	53
	Female	8	0	0	0	0	0	0	0	0	0	0	0	0	8
	Male	3	0	0	0	0	0	2	30	0	0	0	0	0	35
	Unknown	2	0	0	0	0	0	0	8	0	0	0	0	0	10
Saint Marys	All	0	0	0	0	0	0	0	79	0	0	13	26	0	118
	Female	0	0	0	0	0	0	0	0	0	0	13	0	0	13
	Male	0	0	0	0	0	0	0	66	0	0	0	26	0	92
	Unknown	0	0	0	0	0	0	0	13	0	0	0	0	0	13
Scammon Bay	All	0	0	0	0	0	0	12	25	0	2	2	2	0	43
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	12	20	0	2	2	2	0	38
	Unknown	0	0	0	0	0	0	0	5	0	0	0	0	0	5

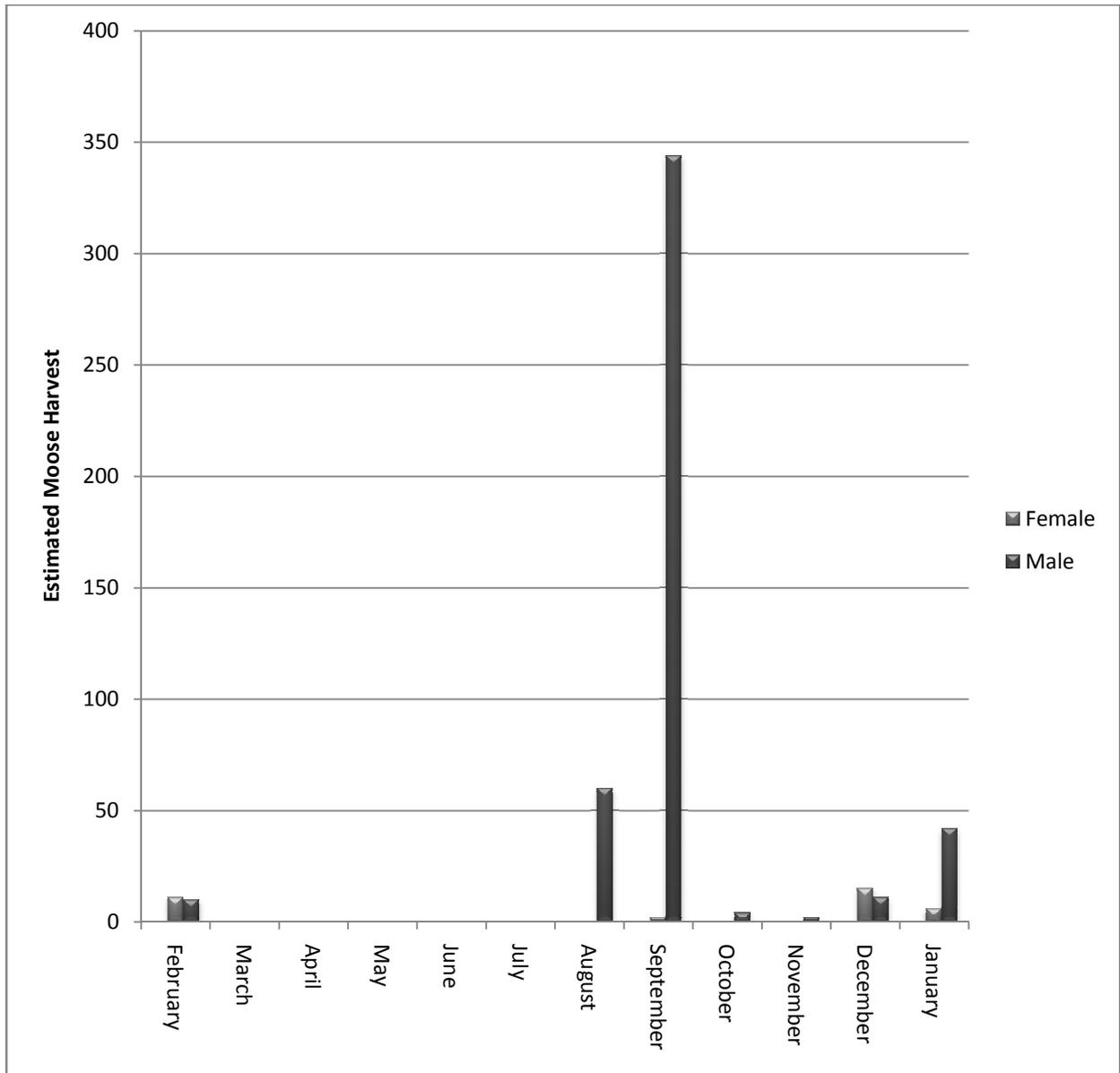


Figure 2. Estimated Moose Harvest by Sex and Month

Subsistence Mapping

Table 7 shows the estimated number of households from each study community that hunted for moose on either (1) federal lands only, (2) non-federal lands only, or (3) both federal and non-federal lands during the year 2000 and the study year, February 1, 2009–January 31, 2010. This mapping method gives a rough estimate of the intensity of use of federal lands by hunters in the study communities. Between 2000 and the recent study year, the percentage of households reporting hunting only on federal land increased from 41 percent to 59 percent study wide. The increase occurred in the villages of Chevak, Mountain Village, Saint Marys, and Scammon Bay, while the number of households hunting only on Federal land declined somewhat in other study communities.

In 2000, study wide 7 percent of households (62) hunted for moose on non-federal land only. This includes less than 16 percent of households in each village. In the lower Yukon River drainage, non-federal public lands consist primarily of village corporation lands located adjacent to villages and along the mainstem Yukon River and its tributaries. During the recent study year, the use was similar with less than 11 percent of households in each village hunting for moose on non-federal public land only.

Table 8 shows the estimated number of moose harvested in each UCU of Unit 18 and portions of Units 19A, 21E, and 21A. Harvest locations are shown for 472 moose. Harvest locations for 77 moose could not be determined because study participants did not provide harvest locations. An estimated 428 moose were harvested in Management Unit 18, in which all the study communities are located. The highest amount of harvest in any given UCU was in UCU 18Z Y000101. This UCU encompasses the communities of Alakanuk and Nunam Iqua. Hunters also harvested an estimated 40 moose in Management Unit 21E. An estimated 5 moose were harvested in Management Unit 22A.

Figure 3 shows how intensely hunters used various areas, defined by UCU, to hunt moose in 2000. This is a measure of how many hunters reported using an area to hunt moose at least once in the study year. Figure 4 indicates the same parameters for the more recent study year, February 2009 to January 2010. The maps appear to indicate that in 2000 more people traveled further to hunt moose than in 2010, although the extent of the area to hunt moose remained the same. For example, in 2000 more hunters reported using Unit 21E, an area north and east of the study communities. In 2010, more hunters reported using areas closer to the study communities and few reported using Unit 21E to hunt moose. How much these differences were affected by changes in the number of hunters during the two study years was not measured.

Figure 5 is a combination of Figures 3 and 4, showing the difference in the number of hunters using each area to hunt moose between the year 2000 and the more recent study year. The UCUs where intensity of use decreased are shown in light gray, checking, and hatching, while UCUs where hunter intensity of use increased is shown in medium gray and dark grey. Intensity of use increased in most UCUs along the Yukon River that are closer to the river mouth. Decreases in intensity of use occurred in the UCUs in Unit 21E and portions of Unit 18 adjacent to Unit 21E.

Table 7. Areas of Attempted Harvest of Moose on Federal and Non-Federal Land								
Community	Estimated Attempted Moose Harvest by Land Status 10 years Ago (Year 2000)				Estimated Attempted Moose Harvest by Land Status February 2009 – January 2010			
	Federal	Non-Federal	Both	Total	Federal	Non-Federal	Both	Total
All (n=896 households)	375	62	478	915	511	32	331	874
Alakanuk (n=117 households)	43	8	133	184	11	7	53	71
Chevak (n=167 households)	11	0	9	20	69	0	19	88
Kotlik (n=97 households)	32	6	87	125	24	2	87	113
Marshall (n=74 households)	47	20	75	142	28	5	62	95
Mountain Village (n=141 households)	99	10	89	198	149	0	23	172
Nunam Iqua (n=34 households)	20	3	17	40	3	0	24	27
Russian Mission (n=67 households)	63	10	50	123	68	14	56	138
Saint Marys (n=119 households)	39	0	13	52	118	0	0	118
Scammon Bay (n=80 households)	21	5	5	31	41	4	7	52

Table 8. Estimated Harvest of Moose by Management Unit and Uniform Coding Unit, February 2009 - January 2010

Uniform Coding Unit	Study Community										
	Alakanuk	Chevak	Kotlik	Marshall	Mountain Village	Nunam Iqua	Russian Mission	Saint Marys	Scammon Bay	Total	Percent
Grand Total	64	29	71	44	110	18	51	119	43	549	100%
Unknown Location	3	0	8	2	2	0	8	54	0	77	14.0%
Subtotal 18Z	54	29	63	42	102	18	38	39	43	428	78.0%
18Z W111402	0	0	0	0	0	0	3	0	0	3	0.5%
18Z Y000101	33	3	0	0	51	18	0	13	2	120	21.9%
18Z Y000102	15	0	63	0	26	0	0	0	0	104	18.9%
18Z Y000201	0	0	0	11	2	0	0	13	0	26	4.7%
18Z Y000202	2	0	0	29	0	0	2	0	0	32	6.0%
18Z Y000204	4	0	0	0	1	0	33	0	0	38	6.9%
18Z Y000401	0	0	0	2	0	0	0	0	0	2	0.4%
18Z Y000501	0	3	0	0	22	0	0	13	38	76	13.8%
18Z Y000502	0	0	0	0	0	0	0	0	2	2	0.4%
18Z Y000601	0	21	0	0	0	0	0	0	1	22	3.8%
18Z Y000603	0	3	0	0	0	0	0	0	0	3	0.5%
Subtotal 21E	2	0	0	0	6	0	5	26	0	39	7.1%
21E Y000201	2	0	0	0	2	0	2	13	0	19	3.5%
21E Y080301	0	0	0	0	4	0	3	13	0	20	3.6%
Subtotal 22A	5	0	0	0	0	0	0	0	0	5	0.9%
22A N000101	5	0	0	0	0	0	0	0	0	5	0.9%

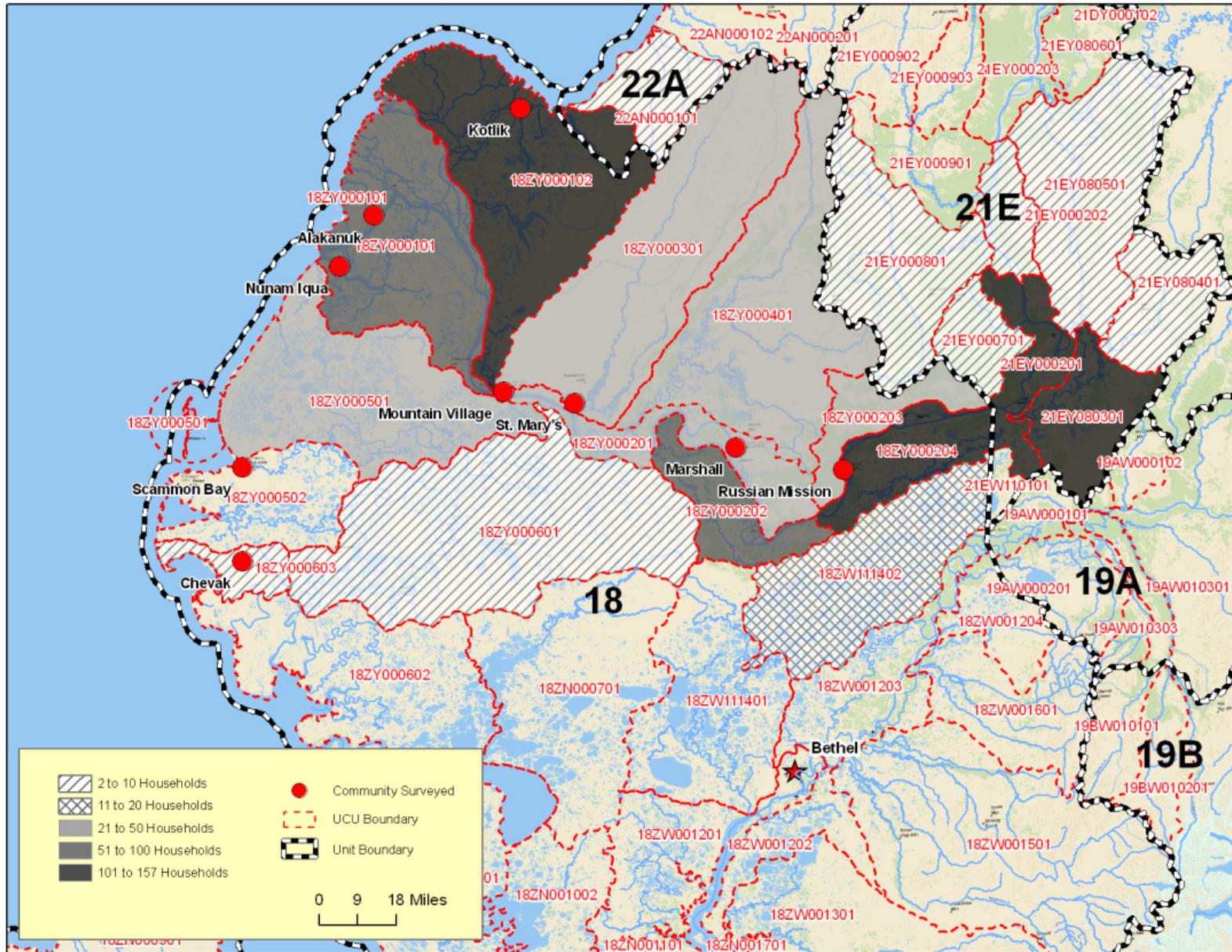


Figure 3. Areas used to hunt moose, by UCU, all study communities, 2000

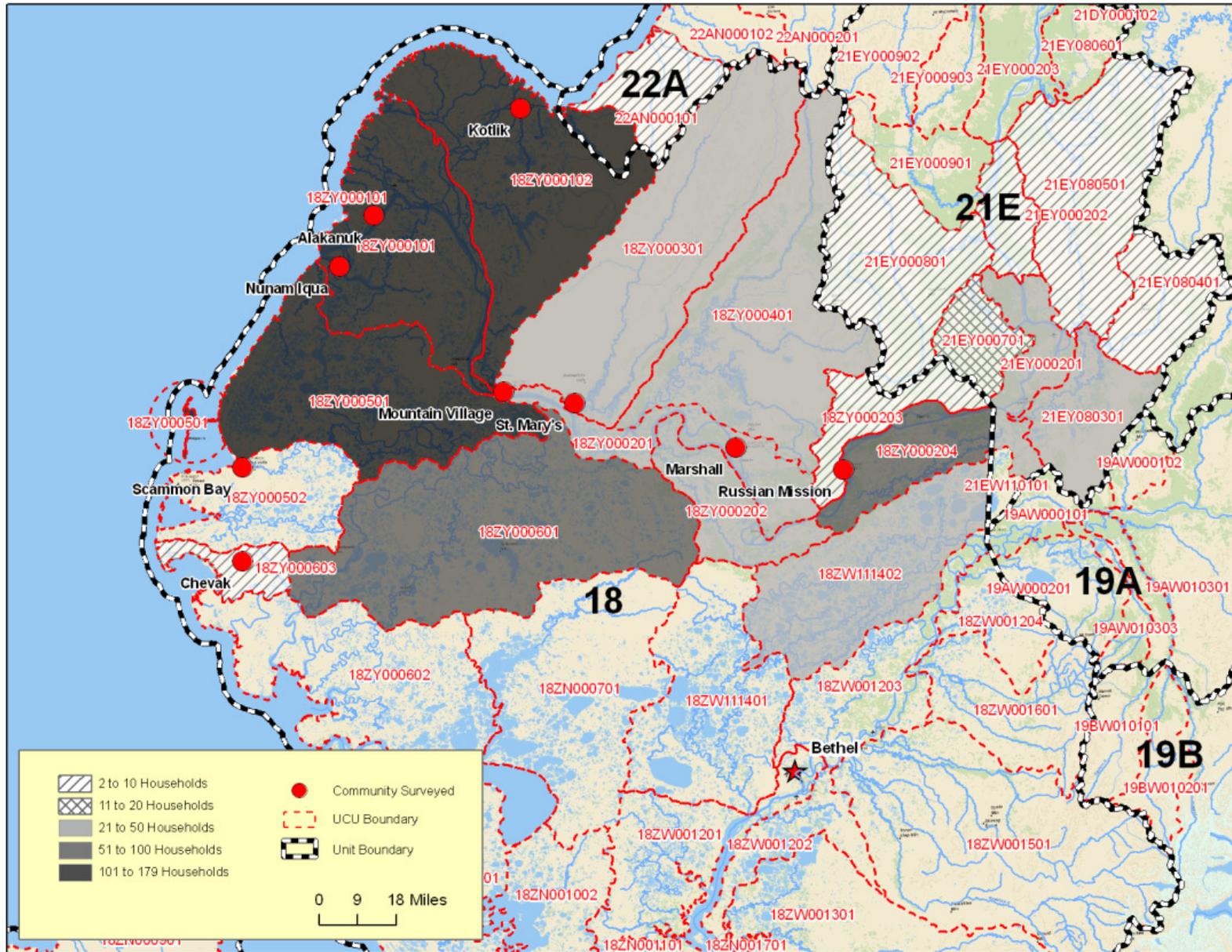


Figure 4. Areas used to hunt moose, by UCU, all study communities, February 2009 to January 2010

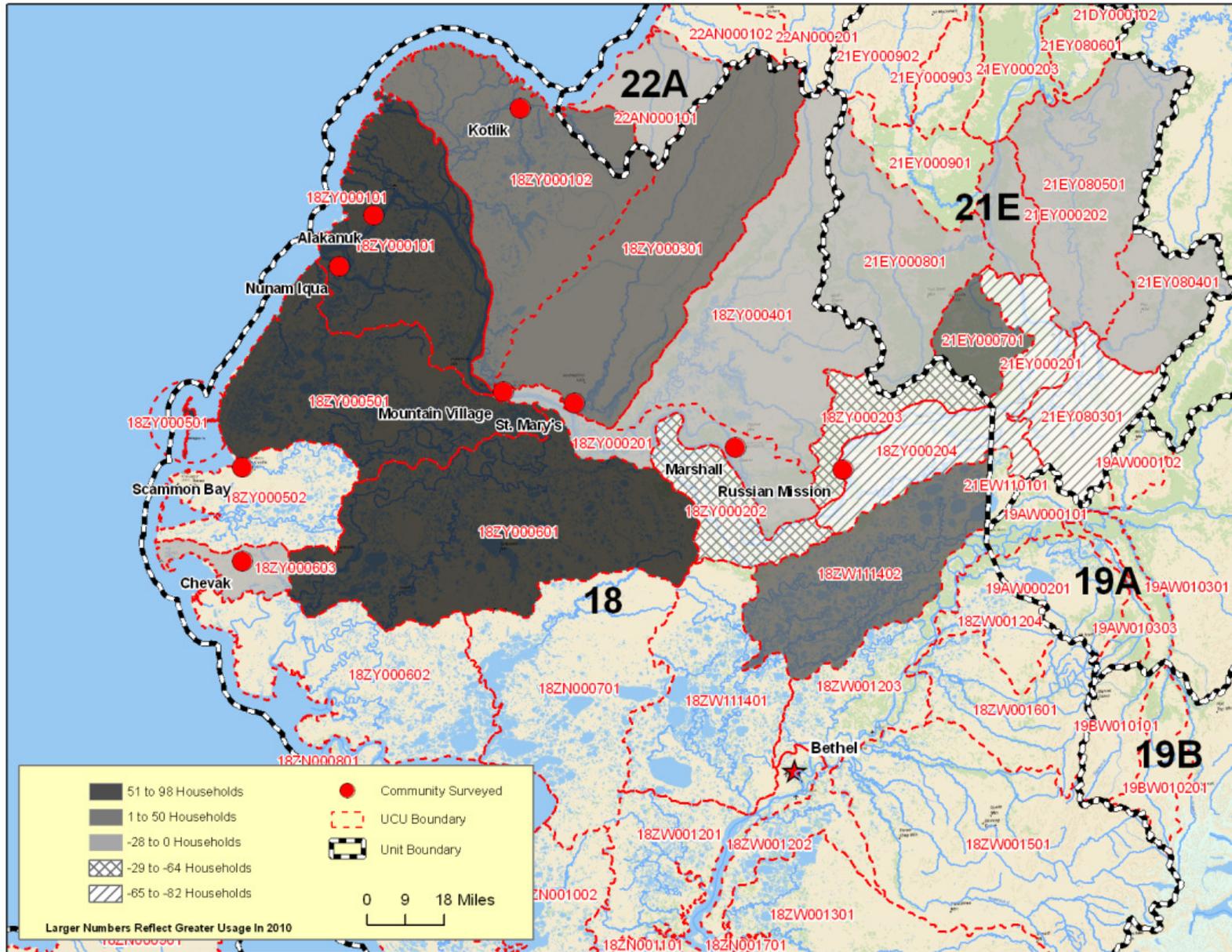


Figure 5. Changes in areas used to hunt moose, by UCU, all study communities, 2000 to 2010

Caribou

Table 9 shows the percentage of households using caribou ranged from a high of 16 percent of households in Marshall to a low of 0 percent in several communities. A low percentage of households hunted for caribou, with a high of six percent in Marshall and a low of 0 percent in multiple communities. Between February 2009 and January 2010, Marshall had the highest harvest success rate at four percent of households. It was followed by Chevak at three percent, and Kotlik and Mountain Village at two percent of households harvesting caribou. Russian Mission had the highest percent of households receiving caribou from others, followed by Chevak, Scammon Bay, Marshall, Kotlik, Mountain Village, and Alakanuk. In terms of the percentage of households giving caribou to others, the community with the highest percentage of giving was Scammon Bay, followed by Russian Mission, Chevak, Marshall, Kotlik, and Mountain Village.

Table 9 also shows that hunters harvested an estimated 25 caribou between February 2009 and January 2010. The community with the largest caribou harvest was Mountain Village with an estimated harvest of nine caribou, followed by Chevak with an estimated harvest of eight caribou. Alakanuk, Nunam Iqua, Russian Mission, and Scammon Bay had no documented harvest of caribou. Because of the different population size of the selected communities, the data from Table 9 should be viewed on a household or per capita basis. From that perspective, Marshall recorded the highest amount of harvest (0.02 caribou harvested per person).

Table 9 also portrays the number of pounds per capita for each of the study communities. The community with the highest per capita pounds of caribou was Marshall with three pounds, followed by Mountain Village at two pounds per capita, and Chevak and Kotlik at one pound per capita. The remainder of the communities reported no harvest of caribou.

Table 10 shows hunter information for each of the study communities. An estimated 19 caribou hunters were in the nine study communities. Of those 19 hunters, approximately 12 hunters were successful; most harvested more than one caribou. This statistic is shown by the number of harvest per successful hunter being larger than 1.0.

Table 9. Levels of Participation in the Use and Harvest of Caribou February 2009 - January 2010.

Participation of Households						Sample Harvest	Estimated Harvest Levels							
Community	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)		Estimated Harvest	95% Confidence Limit of Estimated Total Harvest		Per Household	Per Person	Per Capita Pounds of Harvest	95% Confidence Limit of Estimated pounds per capita	
								Low	High				Low	High
All						12	25							
Alakanuk	4.7	0.0	0.0	4.7	0.0	0	0	0	0	0.00	0.00	0	0	0
Chevak	1.6	3.1	3.1	18.8	7.8	3	8	3	23	0.05	0.01	1	-1	3
Kotlik	10.2	2.0	2.0	10.2	4.1	1	2	1	18	0.02	0.00	1	-4	5
Marshall	16.3	6.1	4.1	12.2	6.1	4	6	4	16	0.08	0.02	3	-2	8
Mountain Village	7.9	1.6	1.6	7.9	1.6	4	9	4	28	0.06	0.01	2	-2	6
Nunam Iqua	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00	0	0	0
Russian Mission	27.9	4.7	0.0	23.3	9.3	0	0	0	0	0.00	0.00	0	0	0
Saint Marys	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00	0	0	0
Scammon Bay	12.8	0.0	0.0	12.8	10.6	0	0	0	0	0.00	0.00	0	0	0

Key
Use = Used Caribou
Att = Attempted to Harvest Caribou
Hrv = Harvested Caribou
Rec = Received Caribou
Gav = Gave Caribou

Table 10. Hunter Information in the Harvest of Caribou February 2009- January 2010.

Community	Hunter Information						
	Estimated Total Hunters				Estimated Successful Hunters*		
	Sample	Estimate	% of Population	Harvest per Hunter	Sample	Estimate	Harvest per Hunter
All	10	19			6	12	
Alakanuk	0	0	0.0	0.0	0	0	0.0
Chevak	2	5	0.6	1.5	2	5	1.5
Kotlik	1	2	0.4	1.0	1	2	1.0
Marshall	3	5	1.7	1.3	2	3	2.0
Mountain Village	1	2	0.3	4.0	1	2	4.0
Nunam Iqua	0	0	0.0	0.0	0	0	0.0
Russian Mission	3	5	1.5	0.0	0	0	0.0
Saint Marys	0	0	0.0	0.0	0	0	0.0
Scammon Bay	0	0	0.0	0.0	0	0	0.0

* Number of successful harvesters based on number of caribou harvested. Only one hunter per household is counted for each caribou.

Figure 6 and Table 11 show the month of successful harvest and the sex of the harvested animal. By far the vast majority of animals were harvested in the winter months of January, February, and March. The highest month of harvest was March, followed by January, and then February. Three caribou were harvested in September. No caribou were harvested in other months. The ratio of bull caribou and cow caribou harvest were nearly equal, with 14 bulls and 11 cows harvested out of the estimated 25 caribou harvested in study communities.

Table 11. Estimated Caribou Harvest by Sex and Month, February 2009 - January 2010.

Community	Sex	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Total
All Communities	All	5	9	0	0	0	0	0	3	0	0	0	8	0	25
	Female	0	7	0	0	0	0	0	0	0	0	0	4	0	11
	Male	5	2	0	0	0	0	0	3	0	0	0	4	0	14
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alakanuk	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chevak	All	5	0	0	0	0	0	0	3	0	0	0	0	0	8
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	5	0	0	0	0	0	0	3	0	0	0	0	0	8
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kotlik	All	0	2	0	0	0	0	0	0	0	0	0	0	0	2
	Female	0	2	0	0	0	0	0	0	0	0	0	0	0	2
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marshall	All	0	7	0	0	0	0	0	0	0	0	0	0	0	7
	Female	0	5	0	0	0	0	0	0	0	0	0	0	0	5
	Male	0	2	0	0	0	0	0	0	0	0	0	0	0	2
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mountain Village	All	0	0	0	0	0	0	0	0	0	0	0	8	0	8
	Female	0	0	0	0	0	0	0	0	0	0	0	4	0	4
	Male	0	0	0	0	0	0	0	0	0	0	0	4	0	4
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nunam Iqua	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 11. Estimated Caribou Harvest by Sex and Month, February 2009 - January 2010 (continued).

Community	Sex	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Total
Russian Mission	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saint Marys	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scammon Bay	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0

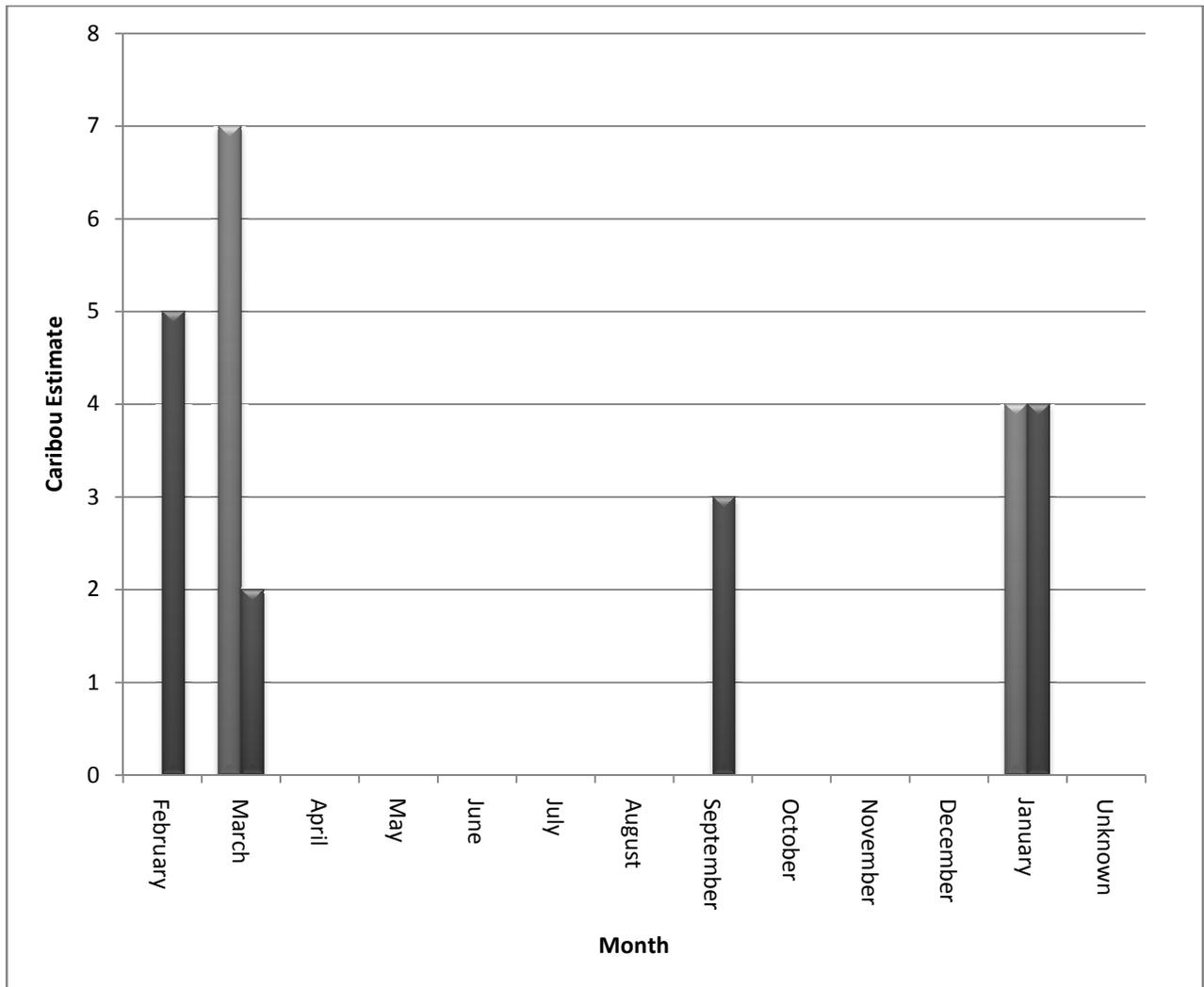


Figure 6. Reported Caribou Harvests by Sex and Month, February 2009 - January 2010

Black Bear

Tables 12 and 13 show the levels of participation in hunting and use of black bear in the communities. Data shows that black bear are rarely harvested in all the surveyed communities in the lower Yukon region.

Table 12 indicates that the percentage of households using black bear ranged from a high of 54 percent of households in Russian Mission to a low of 0 percent in several communities. Households that hunted black bear ranged from a high of 37 percent in Russian Mission to a low of 0 percent in multiple communities. In terms of harvest, Marshall had the highest household harvest success rate at just above 14 percent and multiple communities had no harvest. Russian Mission had the highest percent of households receiving black bear from others and giving black bear to others, followed by Marshall.

Results from Table 12 also show that hunters harvested an estimated 28 black bear between February 2009 and January 2010. The community with the largest sampled black bear harvest was Russian Mission, with an estimated harvest of 14 black bear, followed by Marshall with 12 black bear, and Mountain Village with two black bear harvested. The lowest harvest was in Alakanuk, Chevak, Kotlik, Nunam Iqua, and Scammon Bay where there was no documented harvest of black bear. Because of the different population size of the selected communities, it is more important to view the data from Table 12 on a household or per capita basis. From that perspective, Russian Mission and Marshall both have the highest amount of harvest (0.04 black bear harvested per person).

Table 12 also shows the number of pounds per household and number of pounds per capita for each of the study communities. Per capita pounds of black bear ranged from over four pounds per person in Marshall and Russian Mission. Mountain Village had less than one per capita pound of harvest and the remainder of the communities did not harvest black bear during the study period.

Table 13 shows hunter information for each of the study communities. There were an estimated 77 hunters out of 401 surveyed households in the sample population. Of those 77 hunters, an estimated 20 hunters were successful, most harvesting more than one black bear. This statistic is shown by the number of harvest per successful hunter in both Marshall and Russian Mission being larger than 1.0.

Table 12. Levels of Participation in the Use and Harvest of Black Bear February 2009 - January 2010.

Participation of Households						Sample Harvest	Estimated Harvest Levels							
Community	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)		Estimated Harvest	95% Confidence Limit of Estimated Total Harvest		Per Household	Per Person	Per Capita Pounds of Harvest	95% Confidence Limit of Estimated pounds per capita	
								Low	High				Low	High
All						18	28							
Alakanuk	1.8	3.6	0.0	0.0	1.8	0	0	0	0	0.00	0.00	0.00	0.0	0.0
Chevak	0.0	0.0	0.0	0.0	1.6	0	0	0	0	0.00	0.00	0.00	0.0	0.0
Kotlik	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00	0.00	0.0	0.0
Marshall	34.7	18.4	14.3	14.3	14.3	8	12	8	22	0.16	0.04	4.42	0.6	8.2
Mountain Village	1.6	3.2	1.6	1.6	1.6	1	2	1	21	0.02	0.00	0.35	-2.5	3.2
Nunam Iqua	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00	0.00	0.0	0.0
Russian Mission	53.5	37.2	14.0	39.5	18.6	9	14	9	24	0.21	0.04	4.48	1.3	7.7
Saint Marys	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00	0.00	0.0	0.0
Scammon Bay	0.0	2.1	0.0	0.0	0.0	0	0	0	0	0.00	0.00	0.00	0.0	0.0

Key
Use = Used Black Bear
Att = Attempted to Harvest Black Bear
Hrv = Harvested Black Bear
Rec = Received Black Bear
Gav = Gave Black Bear

Table 13. Hunter Information in the Harvest of Black Bear February 2009- January 2010.

Community	Hunter Information						
	Estimated Total Hunters				Estimated Successful Hunters*		
	Sampled	Estimated	% of Population	Harvest per Hunter	Sampled	Estimated	Harvest per Hunter
All	47	77			13	20	
Alakanuk	6	11	2.1	0.00	0	0	0.00
Chevak	0	0	0.0	0.00	0	0	0.00
Kotlik	0	0	0.0	0.00	0	0	0.00
Marshall	13	20	7.2	0.62	6	9	1.33
Mountain Village	3	7	1.0	0.33	1	2	1.00
Nunam Iqua	0	0	0.0	0.00	0	0	0.00
Russian Mission	23	36	11.4	0.39	6	9	1.50
Saint Marys	0	0	0.0	0.00	0	0	0.00
Scammon Bay	2	3	0.9	0.00	0	0	0.00

* Number of successful harvesters based on number of black bear harvested. Only one hunter per household is counted for each black bear.

Figure 7 and Table 14 show the month of successful harvest and the sex of the harvested animal. By far the vast majority of harvested animals were harvested in the months of August and September. The highest month of harvest was September, followed by August, April, and January. We were unable to estimate the month of harvest for six black bears. No black bear were harvested in February, March, May through July, and October through December. Most black bear harvested were males, with only two female black bear harvested out of the estimated 31 black bear harvested in the study communities.

Table 14. Estimated Black Bear Harvest by Sex and Month, February 2009 - January 2010.

Community	Sex	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Total
All Communities	All	0	0	2	0	0	0	7	14	0	0	0	1	4	28
	Female	0	0	0	0	0	0	0	0	0	0	0	0	2	2
	Male	0	0	2	0	0	0	7	14	0	0	0	1	2	26
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alakanuk	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chevak	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kotlik	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marshall	All	0	0	0	0	0	0	5	6	0	0	0	0	1	12
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	5	6	0	0	0	0	1	12
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mountain Village	All	0	0	0	0	0	0	0	2	0	0	0	0	0	2
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	2	0	0	0	0	0	2
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nunam Iqua	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 14. Estimated Black Bear Harvest by Sex and Month, February 2009 - January 2010 (continued).

Community	Sex	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Total
Russian Mission	All	0	0	2	0	0	0	2	6	0	0	0	1	3	14
	Female	0	0	0	0	0	0	0	0	0	0	0	0	2	2
	Male	0	0	2	0	0	0	2	6	0	0	0	1	1	12
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saint Marys	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scammon Bay	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0

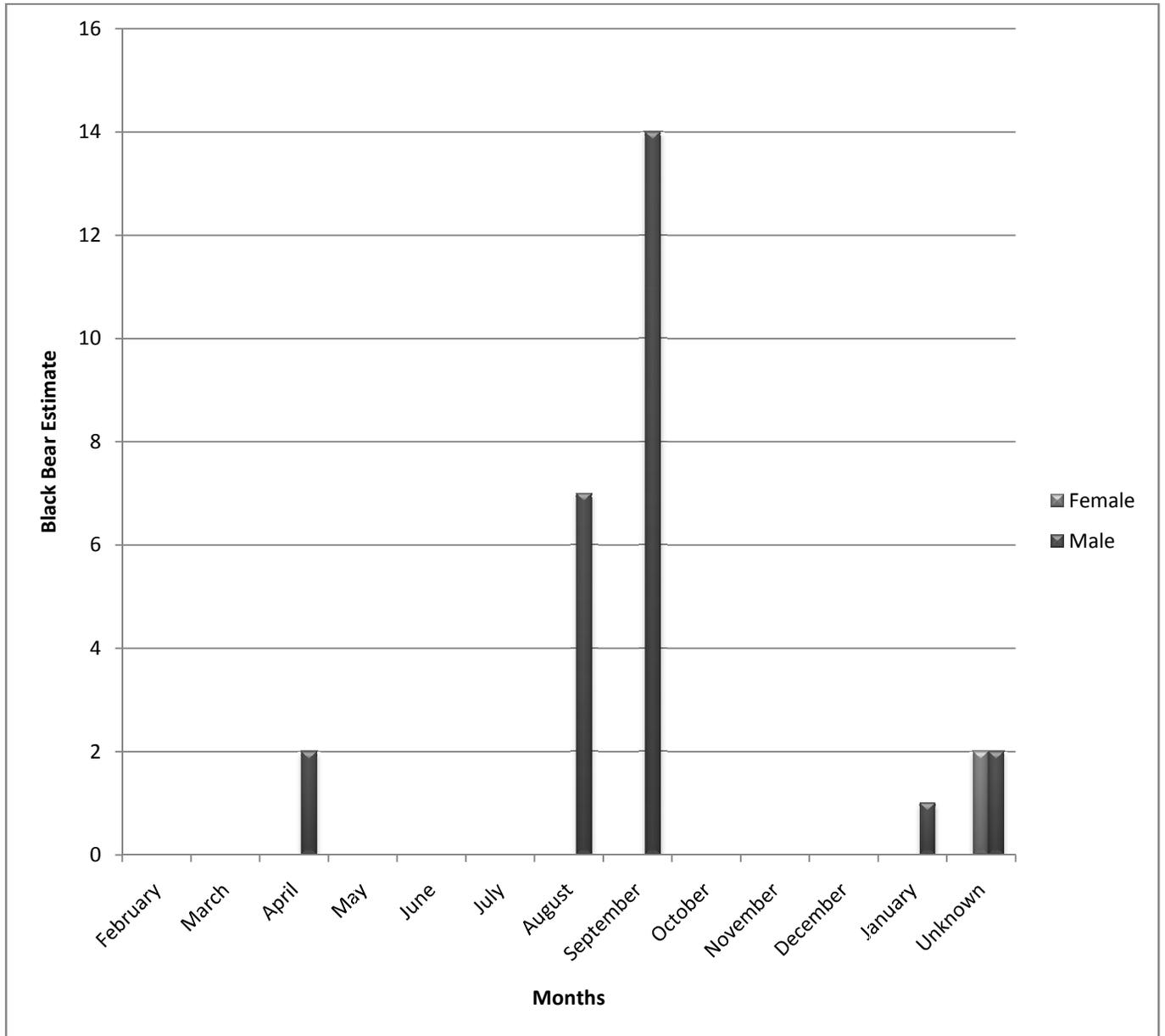


Figure 7. Reported Black Bear Harvests by Sex and Month, February 2009 - January 2010

Brown Bear

This study found that brown bear is rarely harvested in all the surveyed communities in the lower Yukon region. Table 15 shows the percentage of households using brown bear ranged from a high of five percent of households in Russian Mission to a low of 0 percent in all other communities. In terms of households that hunted for brown bear, Russian Mission was the highest with approximately five percent of households hunting brown bear, followed by Marshall at four percent and Mountain Village at two percent of households hunting brown bear. No households harvested brown bear between February 2009 and January 2010. Regarding sharing, five percent of households in Russian Mission received brown bear from others and gave brown bear to others. No other communities reported receiving or giving brown bear.

Results from Table 15 show that hunters did not harvest any brown bear between February 2009 and January 2010. Therefore, the study cannot calculate estimates of total estimated harvest, per household harvest, per capita harvest, confidence limits of estimated harvest, estimates of pounds per household, and estimates of pounds per capita.

Table 15. Levels of Participation in the Use and Harvest of Brown Bear February 2009 - January 2010.

Participation of Households						Sample Harvest	Estimated Harvest Levels					
Community	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)		Estimated Harvest	95% Confidence Limit of Estimated Total Harvest		Per Household	Per Person	Per Capita Pounds of Harvest
								Low	High			
All						0	0					
Alakanuk	0.0	0.0	0.0	0.0	0.0	0	0	0	15	0.00	0.00	0
Chevak	0.0	0.0	0.0	0.0	0.0	0	0	0	15	0.00	0.00	0
Kotlik	0.0	0.0	0.0	0.0	0.0	0	0	0	16	0.00	0.00	0
Marshall	0.0	4.1	0.0	0.0	0.0	0	0	0	10	0.00	0.00	0
Mountain Village	0.0	1.6	0.0	0.0	0.0	0	0	0	19	0.00	0.00	0
Nunam Iqua	0.0	0.0	0.0	0.0	0.0	0	0	0	10	0.00	0.00	0
Russian Mission	4.7	4.7	0.0	4.7	4.7	0	0	0	11	0.00	0.00	0
Saint Marys	0.0	0.0	0.0	0.0	0.0	0	0	0	14	0.00	0.00	0
Scammon Bay	0.0	0.0	0.0	0.0	0.0	0	0	0	72	0.00	0.00	0

Key
Use = Used Brown Bear
Att = Attempted to Harvest Brown Bear
Hrv = Harvested Brown Bear
Rec = Received Brown Bear
Gav = Gave Brown Bear

Table 16 shows hunter information for each of the study communities from the estimated population. The nine communities show approximately 14 hunters in the estimated population. The 14 hunters represent less than one percent of the total population in all selected communities. Of those 14 estimated hunters, none were successful.

Table 16. Hunter Information in the Harvest of Brown Bear February 2009- January 2010.

Community	Hunter Information						
	Estimated Total Hunters				Estimated Successful Hunters*		
	Sample	Estimate	% of Population	Harvest/Hunter	Sample		Harvest/Hunter
All	8	14			0	0	
Alakanuk	0	0	0.0	0.0	0	0	0.0
Chevak	0	0	0.0	0.0	0	0	0.0
Kotlik	0	0	0.0	0.0	0	0	0.0
Marshall	3	5	6.1	0.0	0	0	0.0
Mountain Village	2	4	3.2	0.0	0	0	0.0
Nunam Iqua	0	0	0.0	0.0	0	0	0.0
Russian Mission	3	5	7.0	0.0	0	0	0.0
Saint Marys	0	0	0.0	0.0	0	0	0.0
Scammon Bay	0	0	0.0	0.0	0	0	0.0

* Number of successful harvesters based on number of brown bear harvested. Only one hunter per household is counted for each brown bear.

Muskox

Muskox are rarely harvested in all the surveyed communities in the lower Yukon region, as they are typically not found in or near the study communities. However, muskox are found in Management Unit 22, where the community of Kotlik has a customary and traditional determination to hunt muskox, and on Nunivak and Nelson Islands in Management Unit 18, where hunts are administered under state regulations.

Table 17 shows the percentage of households using muskox ranged from a high of five percent of households in Russian Mission to a low of 0 percent in several communities. Only two percent of households hunted and harvested muskox in Marshall. No other communities hunted or harvested muskox during the study period. The community with the highest percentage of households that received muskox from others was Russian Mission at two percent of household, followed by Chevak and Mountain Village. No households reported receiving muskox from others in the other study communities. The community with the highest percentage of households that gave muskox to others was Marshall at two percent of households, followed by Chevak. No households reported giving muskox to others in the other study communities.

Additional results from Table 17 show that hunters in Marshall harvested an estimated two muskox between February 2009 and January 2010. There was no documented harvest of muskox in Alakanuk, Chevak, Kotlik, Mountain Village, Nunam Iqua, Russian Mission, and Scammon Bay. In terms of household or per capita harvest, Marshall had the highest amount of harvest (0.01 muskox harvested per person).

Table 17 also shows the number of pounds per capita for each of the study communities. The per capita pounds of muskox were just over three pounds in Marshall. The other communities in the study did not report any harvest of muskox; thus, no pounds per capita could be calculated in those communities.

Table 18 shows hunter information for each of the study communities from the sampled population. The nine communities show approximately two estimated hunters in the study population (both in Marshall). The estimated hunters represent less than one percent of the total population in all selected communities. The two estimated hunters in Marshall were successful, harvesting two muskox.

Table 17. Levels of Participation in the Use and Harvest of Muskox, February 2009 - January 2010.

Participation of Households						Sample Harvest	Estimated Harvest Levels							
Community	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)		Estimated Harvest	95% Confidence Limit of Estimated Total Harvest		Per Household	Per Person	Per Capita Pounds of Harvest	95% Confidence Limit of Estimated pounds per capita	
								Low	High				Low	High
All						1	2							
Alakanuk	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	-17.0	17.0
Chevak	3.1	0.0	0.0	3.1	1.6	0	0	0	0	0	0	0	-9.7	9.7
Kotlik	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	-19.4	19.4
Marshall	2.0	2.0	2.0	0.0	2.0	1	2	1	12	0.02	0.01	3.3	-19.1	25.7
Mountain Village	1.6	0.0	0.0	1.6	0.0	0	0	0	0	0	0	0	-17.1	17.1
Nunam Iqua	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	-18.9	18.9
Russian Mission	4.7	0.0	0.0	4.7	0.0	0	0	0	0	0	0	0	-16.6	16.6
Saint Marys	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	-46.5	46.5
Scammon Bay	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	-53.1	53.1

Key
Use = Used Muskox
Att = Attempted to Harvest Muskox
Hrv = Harvested Muskox
Rec = Received Muskox
Gav = Gave Muskox

Table 18. Hunter Information in the Harvest of Muskox, February 2009- January 2010.

Community	Hunter Information						
	Estimated Total Hunters				Estimated Successful Hunters*		
	Sample	Estimate	% of Population	Harvest/Hunter	Sample	Estimate	Harvest/Hunter
All	1	2			1	2	
Alakanuk	0	0	0.0	0.0	0	0	0.0
Chevak	0	0	0.0	0.0	0	0	0.0
Kotlik	0	0	0.0	0.0	0	0	0.0
Marshall	1	2	0.6	1.0	1	2	1.0
Mountain Village	0	0	0.0	0.0	0	0	0.0
Nunam Iqua	0	0	0.0	0.0	0	0	0.0
Russian Mission	0	0	0.0	0.0	0	0	0.0
Saint Marys	0	0	0.0	0.0	0	0	0.0
Scammon Bay	0	0	0.0	0.0	0	0	0.0

* Number of successful harvesters based on number of muskox harvested. Only one hunter per household is counted for each muskox.

Wolverine

Table 19 shows the percentage of households using wolverine ranged from a high of 16 percent of households in Russian Mission to a low of 0 percent in several communities. The average across all study communities was two percent of households using wolverine. An average of two percent of households across all communities hunted for wolverine, with a high of 11 percent in Russian Mission and a low of 0 percent in multiple communities. Approximately two percent of households in Marshall harvested wolverine between February 2009 and January 2010. No other communities harvested wolverine during the study period. The community with the highest percentage of households that received wolverine from others was Kotlik at two percent of households. No households reported receiving wolverine from others in the other study communities. The community with the highest percentage of households that gave wolverine to others was Russian Mission at just over two percent of households, followed by Kotlik. No households reported giving wolverine to others in the other study communities.

Results from Table 19 show that hunters and/or trappers in Marshall harvested two wolverine between February 2009 and January 2010. There was no documented harvest of wolverine in Alakanuk, Chevak, Kotlik, Mountain Village, Nunam Iqua, Russian Mission, and Scammon Bay. In terms of household or per capita harvest, Marshall had the highest amount of harvest (0.01 wolverine harvested per person). The other communities in the study did not harvest wolverine.

Table 20 shows wolverine hunter or trapper information for each of the study communities from the estimated population. The eight communities show approximately 15 hunters/trappers in the estimated study population. Two hunters/trappers in Marshall were successful, harvesting two wolverine.

Table 19. Levels of Participation in the Use and Harvest of Wolverine, February 2009 - January 2010.

Participation of Households						Sample Harvest	Estimated Harvest Levels				
Community	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)		Estimated Harvest	95% Confidence Limit of Estimated Total Harvest		Per Household	Per Person
								Low	High		
All						1	2				
Alakanuk	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00
Chevak	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00
Kotlik	4.2	2.1	0.0	2.1	2.1	0	0	0	0	0.00	0.00
Marshall	0.0	4.1	2.0	0.0	0.0	1	2	1	12	0.02	0.01
Mountain Village	0.0	1.6	0.0	0.0	0.0	0	0	0	0	0.00	0.00
Nunam Iqua	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00
Russian Mission	16.3	11.6	0.0	0.0	2.3	0	0	0	0	0.00	0.00
Saint Marys	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00
Scammon Bay	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00

*Note: Because there is no conversion factor for wolverine, pounds per household and pounds per capita cannot be calculated.

Key
Use = Used Wolverine
Att = Attempted to Harvest Wolverine
Hrv = Harvested Wolverine
Rec = Received Wolverine
Gav = Gave Wolverine

Table 20. Hunter Information in the Harvest of Wolverine, February 2009- January 2010.

Community	Hunter Information						
	Estimated Total Hunters				Estimated Successful Hunters*		
	Sample	Estimate	% of Population	Harvest/Hunter	Sample	Estimate	Harvest/Hunter
All	9	15			1	2	
Alakanuk	0	0	0.0	0.0	0	0	0
Chevak	0	0	0.0	0.0	0	0	0
Kotlik	1	2	2.0	0.0	0	0	0
Marshall	2	3	4.1	0.7	1	2	1.0
Mountain Village	1	2	1.6	0.0	0	0	0
Nunam Iqua	0	0	0.0	0.0	0	0	0
Russian Mission	5	8	11.6	0.0	0	0	0
Saint Marys	0	0	0.0	0.0	0	0	0
Scammon Bay	0	0	0.0	0.0	0	0	0

* Number of successful harvesters based on number of wolverine harvested. Only one hunter per household is counted for each wolverine.

Wolf

Table 21 shows the percentage of households using wolf ranged from a high of 23 percent of households in Russian Mission to a low of 0 percent in several communities. The highest percentage of households hunting or trapping wolf was in Russian Mission, with 16 percent of households reporting hunting or trapping wolf between February 2009 and January 2010. In terms of harvest, Mountain Village had the highest success rate of households at nearly 10 percent, followed by Kotlik and Marshall. The remaining communities had no harvest. The community with the highest percentage of households that received wolf from others was Kotlik at four percent of households, followed by Russian Mission and Mountain Village. No households reported receiving wolf from others in the other study communities. The community with the highest percentage of households that gave wolf to others was Mountain Village at six percent of households, followed by Russian Mission. No households reported giving wolf to others in the other study communities.

Results from Table 21 show that hunters harvested an estimated 35 wolf between February 2009 and January 2010. The community with the largest estimated wolf harvest was Mountain Village, with an estimated harvest of 22 wolves, followed by Marshall and Kotlik. Alakanuk, Chevak, Nunam Iqua, Russian Mission, and Scammon Bay reported no harvest of wolf. Because of the different population size of the selected communities, it is more important to view the data from Table 21 on a per capita basis. From that perspective, both Marshall and Mountain Village had the highest amount of harvest (0.03 wolves harvested per person).

Table 22 shows hunter/trapper information for each of the study communities from the sampled population. The eight communities show approximately 44 hunters/trappers in the study population. Of those 44 hunters/trappers, approximately 19 were successful, most harvesting more than one wolf. This statistic is shown by the number of harvests per successful hunter being greater than 1.0.

Table 21. Levels of Participation in the Use and Harvest of Wolf, February 2009 - January 2010.											
Participation of Households						Sample Harvest	Estimated Harvest Levels				
Community	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)		Estimated Harvest	95% Confidence Limit of Estimated Total Harvest		Per Household	Per Person
								Low	High		
All						18	35				
Alakanuk	1.6	1.6	0.0	0.0	0.0	0	0	0	0	0.00	0.00
Chevak	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00
Kotlik	6.2	6.2	4.2	4.2	0.0	2	4	2	20	0.04	0.01
Marshall	2.0	12.2	2.0	0.0	0.0	6	9	6	19	0.12	0.03
Mountain Village	9.5	11.1	9.5	1.6	6.3	10	22	10	41	0.16	0.03
Nunam Iqua	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00
Russian Mission	23.3	16.3	0.0	2.3	4.7	0	0	0	0	0.00	0.00
Saint Marys	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00
Scammon Bay	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0.00	0.00

*Note: Because there is no conversion factor for wolves, pounds per household and pounds per capita cannot be calculated.

Key
Use = Used Wolf
Att = Attempted to Harvest Wolf
Hrv = Harvested Wolf
Rec = Received Wolf
Gav = Gave Wolf

Table 22. Hunter Information in the Harvest of Wolf, February 2009- January 2010.

Community	Hunter Information						
	Estimated Total Hunters				Estimated Successful Hunters*		
	Sample	Estimate	% of Population	Harvest/Hunter	Sample	Estimate	Harvest/Hunter
All	24	44			9	19	
Alakanuk	1	2	1.6	<0.1	0	0	0.0
Chevak	0	0	0.0	0.0	0	0	0.0
Kotlik	3	6	6.1	0.7	2	4	1.0
Marshall	6	9	12.2	1.0	1	2	4.5
Mountain Village	7	16	11.1	1.4	6	13	1.7
Nunam Iqua	0	0	0.0	0.0	0	0	0.0
Russian Mission	7	11	16.3	0.0	0	0	0.0
Saint Marys	0	0	0.0	0.0	0	0	0.0
Scammon Bay	0	0	0.0	0.0	0	0	0.0

* Number of successful harvesters based on number of wolves harvested. Only one hunter per household is counted for each wolf.

Figure 8 and Table 23 show the month of successful harvest and the sex of the harvested animal. By far the vast majority of harvested animals were harvested in the winter months. The month of highest harvest was March, followed by November, January, and October. Study participants were unable to recall the month of harvest for seven wolves. No wolves were harvested in the months of February, April through September, and December. Most of the wolves harvested were male, with only eight female wolves harvested out of the 35 wolves harvested.

Table 23. Estimated Wolf Harvest by Sex and Month, February 2009 - January 2010.

Community	Sex	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Total
All	All	0	11	0	0	0	0	0	0	2	9	0	6	7	35
	Female	0	6	0	0	0	0	0	0	0	0	0	2	0	8
	Male	0	5	0	0	0	0	0	0	2	9	0	4	7	27
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alakanuk	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chevak	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kotlik	All	0	2	0	0	0	0	0	0	0	0	0	2	0	4
	Female	0	2	0	0	0	0	0	0	0	0	0	0	0	2
	Male	0	0	0	0	0	0	0	0	0	0	0	2	0	2
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marshall	All	0	9	0	0	0	0	0	0	0	0	0	0	0	9
	Female	0	4	0	0	0	0	0	0	0	0	0	0	0	4
	Male	0	5	0	0	0	0	0	0	0	0	0	0	0	5
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mountain Village	All	0	0	0	0	0	0	0	0	2	9	0	4	7	22
	Female	0	0	0	0	0	0	0	0	0	0	0	2	0	2
	Male	0	0	0	0	0	0	0	0	2	9	0	2	7	20
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nunam Iqua	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 23. Estimated Wolf Harvest by Sex and Month, February 2009 - January 2010 (continued).

Community	Sex	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Total
Russian Mission	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Saint Marys	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scammon Bay	All	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0	0	0	0	0	0

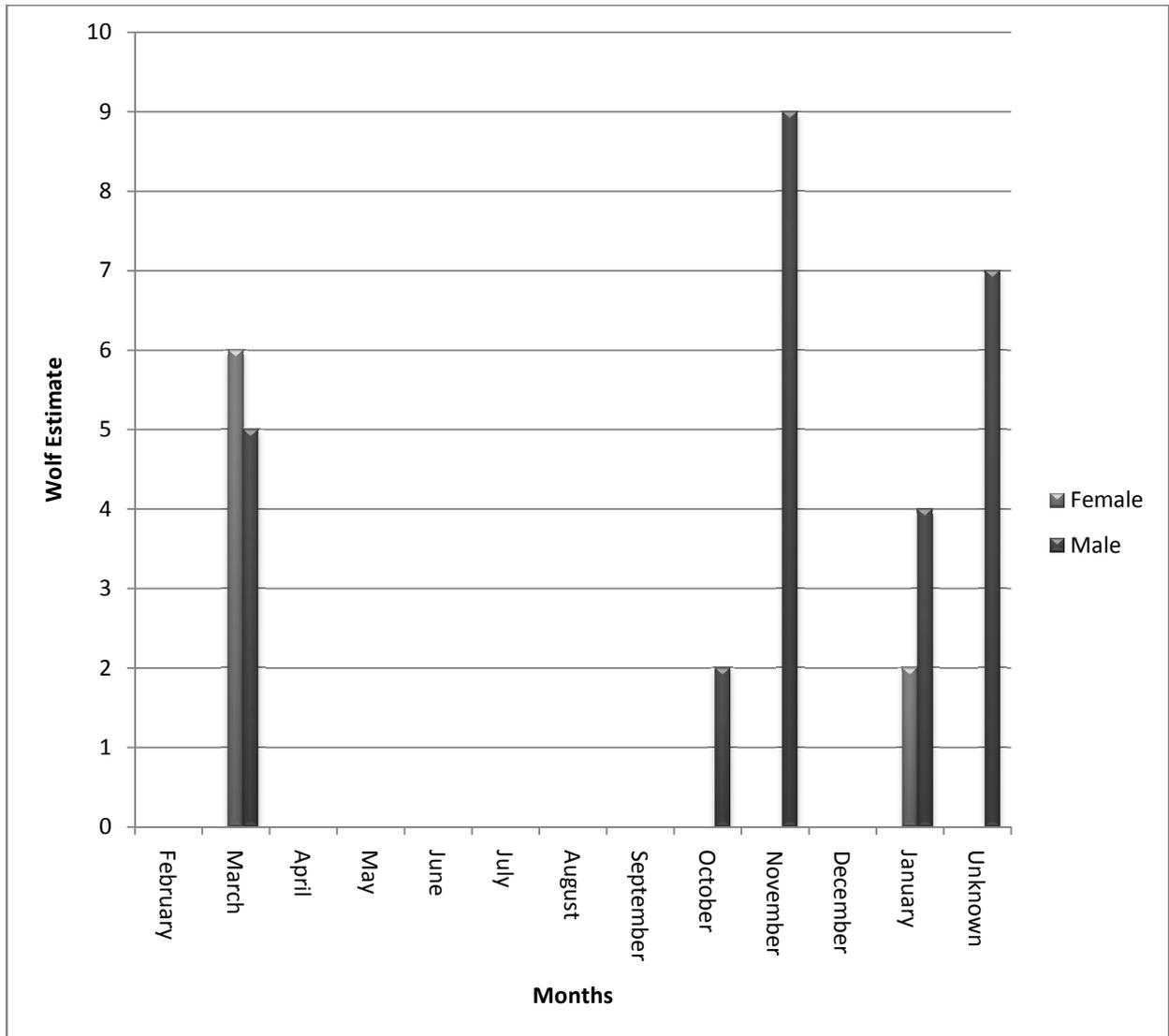


Figure 8. Reported Wolf Harvests by Sex and Month, February 2009 - January 2010

Discussion

Methods

One of the limitations to the data in this study is the low study participation rates in the communities of Nunam Iqua and Saint Marys. Because the participation rates are below sample rates that were established prior to fieldwork, there is some concern about non-response bias in the data for those communities. In other words, the data may not accurately represent actual large land mammal harvest for the communities. In addition, another limitation is the absence of general harvest locations for the other species besides moose. While the local interviewers were asked to document general harvest locations for other species, in hindsight, it would have been better to include a qualitative question asking where the hunter harvested the animal.

The use of a specific point in time instead of a ten-year span to evaluate historical patterns of hunting effort (where did you hunt in the calendar year 2000 vs. where have you hunted in the last ten years) was a non-conventional method of data collection for subsistence harvest studies. However, in discussions with federal and state wildlife biologists (personal communications with E. Wald, 2009, and P. Perry, 2009), 2000 was a time when moose populations around the study communities were much lower and better represented historical patterns of use. During data collection, most study respondents were able to clearly identify their hunting locations during that calendar year and the data shows that hunting effort from residents in the study communities were more dispersed.

The use of a laptop computer to document subsistence harvest locations and hunting areas in Nunam Iqua was met with mixed success. The data acquired using the laptop computer appears to be much more precise than the use of UCUs in documenting harvest locations and hunting effort. The use of a computer also allows for quicker and more accurate database and map development, rather than entering the data by hand and extrapolating the information to create harvest location tables and use area maps. However, the low study participation rate in the community limited the success of the test. Another critical factor in using laptop computers for subsistence use area mapping is finding interviewers in rural communities who are knowledgeable about subsistence, local hunting practices, local cultures, and computers. While we had great success with the local interviewer in Nunam Iqua, in many rural communities, it could be a difficult task to find such highly qualified interviewers. Therefore, we suggest using laptop computers to document subsistence use areas only in communities where the researchers can either hire highly qualified residents or can carry out the data collection themselves.

Moose

As the data appear to confirm, increases in moose populations along the lower Yukon River have increased subsistence hunting and harvesting of moose in that area. Hunters were able to hunt closer to their communities, thus reducing costs and time associated with travel to other locations. Hunter effort for moose is extensive in the region, with surveyed households showing an estimated 1,047 individuals spent an average of 10.6 hunter days and a total of 11,122 days hunting for moose. Hunter success rates ranged from 40 to 60 percent for moose, among the highest in the State of Alaska. By contrast, hunter success rates in the Bethel area are around six percent (personal communication with Tom Doolittle, October 26, 2010).

Most residents in the study communities use moose as a source of food and also for use in making handicrafts, such as using the hide for tanning or creating carvings using the antlers or bones. Table 3 shows that the majority of households, at least 70 percent, in each community reported using moose during the study year, February 2009–January 2010, except Chevak where only 28 percent of households reported using moose. Based on Table 3, while 69 percent of Chevak households received moose from another household, only 28 percent were reported on survey forms to have used moose during the study year. It appears that the attempted harvesting of moose was mistakenly recorded as the household using moose. Thus, the use of moose reported in Chevak was likely higher during the study year than reported on Table 3.

Also concerning Chevak, prior to July 2010 Chevak and its primary hunting location along the Kashimuk River, based on harvest sites reported on Table 8, were located outside of the lower Yukon River drainage hunting area defined in regulations. During the study year, the Kashimuk River was located in the regulatory “remainder area” of Unit 18. Harvest seasons and harvest limits were the same as those above Mountain Village, shown above. Therefore, the majority of Chevak residents were not hunting in an area with the more liberal moose harvest seasons and harvest limits. This is different than the experience of the eight other communities participating in the study, which are situated in an area with the more liberal moose regulations. It should be noted that in July 2010 new regulations went into effect changing the boundary of the lower Yukon River drainage moose hunting area. The southern boundary is currently defined as the Kashimuk River, and Chevak and its primary hunting area are now included in this area.

Table 7 shows the estimated land status of hunting locations for each of the study communities. A large majority of hunting locations occurred on federal land and land of mixed ownership. These results are not surprising, given the high amount of federal lands and the number of small parcels of privately owned lands (usually village corporation lands) within the study area. Village corporation lands are usually found near communities and along rivers. Very little state land occurs in the study area.

Caribou

Caribou were rarely harvested by residents of the nine study communities in the lower Yukon region, as there are no caribou herds located in the project area. Instead, residents must travel to other areas to harvest caribou. In fact, one respondent reported traveling to Management Unit 20 (near Fairbanks) to harvest caribou. Table 9 shows the percentage of households using caribou ranged from a high of 16 percent of households in Marshall to a low of 0 percent in several communities. A low percentage of households hunted for caribou, with a high of six percent in Marshall and a low of 0 percent in multiple communities. Across all communities, most communities had a higher percentage of households received caribou from others than the percentage of households that gave caribou to others or that hunted caribou. Given the higher number of households that received caribou from others, we believe that many residents in the study communities received caribou from friends and relatives who live outside the study communities that have closer access to caribou.

Black Bear

Table 12 shows the percentage of households using black bear ranged from a high of 54 percent of households in Russian Mission to a low of 0 percent in several communities. The study by Mary Pete (1991) of hunting patterns in Russian Mission shows that residents in Russian Mission

have a long history of hunting black bears for consumption and black bear have been in the area for longer periods of time than the communities that are closer to the mouth of the Yukon River. Historically, black bear were rare along the lower river and we suspect that residents closer to the mouth of the Yukon River are less familiar with hunting and consumption practices with black bear.

Brown Bear, Muskox, Wolverine, Wolf

Hunting of other large land mammals (muskox, brown bear, wolverine, or wolf) occurs at relatively low levels in the lower Yukon region. For some species, such as muskox, residents in the nine communities generally would have to travel to other locations to hunt. Other species, such as wolverine and muskox are either rare in the lower Yukon area or recently established populations in the area, thus harvest is infrequent. In some cases, it is likely that residents are less familiar with the use of a species, such as brown bear, for consumption.

Across all communities, less than one percent of households received wolverine from others and less than one percent of households gave wolverine to others. Some of the information gathered from communities show that residents in several communities used, received, or gave wolverine when no harvest was documented during the study. This is most likely the result of using wolverine fur for handicrafts. Wolverine harvested the previous year would be available for use during the time of the study after preservation or tanning.

Information from key informants suggests that most wolves are taken in traps or opportunistically when residents are out hunting other species. Wolf harvest generally relies upon good snow conditions so hunters can use snow machines to efficiently find and hunt wolves. During the February 2009 to January 2010 study year, very little snow fell in the lower Yukon region. According to key informants, the poor snow cover likely contributed to a lower wolf harvest.

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Appendix 1. Study Questionnaire

2010 Lower Yukon Large Land Mammal Survey

Interviewer Initials _____
Community _____
Household ID number _____
Date _____

Hello, my name is _____ and I am conducting large land mammal subsistence harvest surveys for the US Fish and Wildlife Service, Office of Subsistence Management. I would like to talk to someone about your household's hunting activities from February 2009 to January 2010. The US Fish and Wildlife Service, Office of Subsistence Management is conducting this research to get more information on harvest of large land mammals (including moose, bear, caribou, muskox, wolverine, and wolf). This information helps resource agencies and the Federal Subsistence Board with decisions on how to manage wildlife populations and update regulations in response to changes in wildlife populations. All information that you provide will be kept confidential and your name will not be used in any documents. Are you willing to be interviewed?

Yes No

Could you please tell me how many people lived in your household between February 1, 2009 and January 31, 2010?

Section 1. Moose

I would like to ask you several questions about your household's moose hunting activities.

1. Between Feb. 1, 2009 and Jan. 31, 2010, did members of your household:

Use Moose	Hunt Moose	Harvest Moose	Receive Moose	Give Moose
<input type="checkbox"/> Yes <input type="checkbox"/> No				

2. How many members of your household hunted moose between Feb. 1, 2009 and Jan. 31, 2010? _____

3. How many days did each hunter spend hunting moose between Feb. 1, 2009 and Jan. 31, 2010?

Hunter 1 _____ Hunter 2 _____ Hunter 3 _____ Hunter 4 _____ Hunter 5 _____

4. Would you please show me the areas that members of your household attempted to harvest moose 10 years ago?

And between February 1, 2009 and January 31, 2010?

Location - 10 years ago (UCU)	Land Status (Federal, non-federal, or both)	Location – Feb. 2009 to Jan. 2010 (UCU)	Land Status (Federal, non- federal, or both)

5. How many moose did members of your household harvest between Feb. 1, 2009 and Jan. 31, 2010? _____

M	Location (UCU)	M or F	2009												2010	UNK	Can others claim?
			FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN			
1																	
2																	
3																	
4																	
5																	

Section 2. Caribou

1. Between Feb. 1, 2009 and Jan. 31, 2010, did members of your household:

Use Caribou	Hunt Caribou	Harvest Caribou	Receive Caribou	Give Caribou
<input type="checkbox"/> Yes <input type="checkbox"/> No				

2. How many members of your household hunted caribou between Feb. 1, 2009 and Jan. 31, 2010? _____

3. How many caribou did members of your household harvest between Feb. 1, 2009 and Jan. 31, 2010? _____

C	M or F	2009												2010	UNK	Can others claim?
		FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN			
1																
2																
3																
4																
5																

Section 3. Muskox

1. Between Feb. 1, 2009 and Jan. 31, 2010, did members of your household:

Use Muskox	Hunt Muskox	Harvest Muskox	Receive Muskox	Give Muskox
<input type="checkbox"/> Yes <input type="checkbox"/> No				

2. How many members of your household hunted muskox between Feb. 1, 2009 and Jan. 31, 2010? _____

3. How many muskoxen did members of your household harvest between Feb. 1, 2009 and Jan. 31, 2010? _____

MX	M or F	2009												2010	UNK	Can others claim?
		FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN			
1																
2																
3																
4																
5																

Section 4. Black Bear

1. Between Feb. 1, 2009 and Jan. 31, 2010, did members of your household:

Use Black Bear	Hunt Black Bear	Harvest Black Bear	Receive Black Bear	Give Black Bear
<input type="checkbox"/> Yes <input type="checkbox"/> No				

2. How many members of your household hunted black bear between Feb. 1, 2009 and Jan. 31, 2010? _____

3. How many black bear were harvested in your household between Feb. 1, 2009 and Jan. 31, 2010? _____

BL	M or F	2009											2010	UNK	Can others claim?
		FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN		
1															
2															
3															
4															
5															

Section 5. Brown Bear

1. Between Feb. 1, 2009 and Jan. 31, 2010, did members of your household:

Use Brown Bear	Hunt Brown Bear	Harvest Brown Bear	Receive Brown Bear	Give Brown Bear
<input type="checkbox"/> Yes <input type="checkbox"/> No				

2. How many members of your household hunted brown bear between Feb. 1, 2009 and Jan. 31, 2010? _____

3. How many brown bear were harvested in your household between Feb. 1, 2009 and Jan. 31, 2010? _____

BR	M or F	2009											2010	UNK	Can others claim?
		FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN		
1															
2															
3															
4															
5															

Section 6. Wolverine

1. Did members of your household hunt or trap wolverines between Feb. 1, 2009 and January 31, 2010?

Yes No *(If Yes, go to Question 2. If No, go to Section 7)*

2. Between Feb. 1, 2009 and Jan. 31, 2010, did members of your household:

Use Wolverine	Receive Wolverine	Give Wolverine
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

3. How many wolverines were harvested in your household between Feb. 1, 2009 and Jan. 31, 2010? _____

WV	M or F	2009											2010	UNK	Can others claim?	
		FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN			
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																

Section 7. Wolf

1. Did members of your household hunt or trap wolves between Feb. 1, 2009 and January 31, 2010?

Yes No (If Yes, go to Question 2. If No, thank them for their time)

2. Between Feb. 1, 2009 and Jan. 31, 2010, did members of your household:

Use Wolf	Receive Wolf	Give Wolf
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

3. How many wolves were harvested in your household between Feb. 1, 2009 and Jan. 31, 2010? _____

W	M or F	2009											2010	UNK	Can others claim?	
		FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN			
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																