Special Publication No. SP2011-003

Subsistence Wildlife Harvests in Noorvik, Shungnak, and White Mountain, Alaska, 2008–2009

by

Nicole M. Braem

June 2012

Alaska Department of Fish and Game **Division of Subsistence**

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Measures (fisheries)

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

Mathematics, statistics

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

SPECIAL PUBLICATION NO. SP2011-003

SUBSISTENCE WILDLIFE HARVESTS IN NOORVIK, SHUNGNAK, AND WHITE MOUNTAIN, ALASKA, 2008–2009

by

Nicole M. Braem,
Alaska Department of Fish and Game, Division of Subsistence, Fairbanks

Alaska Department of Fish and Game
Division of Subsistence
1300 College Road, Fairbanks, Alaska, 99701-1551

June 2012

The Division of Subsistence Special Publications series was established for the publication of techniques and procedure manuals, informational pamphlets, special subject reports to decision-making bodies, symposia and workshop proceedings, application software documentation, in-house lectures, and other documents that do not fit in another publications series of the Division of Subsistence. Most Special Publications are intended for readers generally interested in fisheries, wildlife, and the social sciences; for natural resource technical professionals and managers; and for readers generally interested the subsistence uses of fish and wildlife resources in Alaska.

Special Publications are available through the Alaska Resources Library and Information Services (ARLIS), the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/. This publication has undergone editorial and professional review.

Nicole M. Braem
Alaska Department of Fish and Game, Division of Subsistence
1300 College Road, Fairbanks, AK 99701-1551 USA

This document should be cited as:
Braem, N.M. 2012. Subsistence wildlife harvests in Noorvik, Shungnak, and White Mountain, Alaska, 2008–2009. Alaska Department of Fish and Game Division of Subsistence, Special Publication No. SP2011-003, Fairbanks.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

This report summarizes the results of big game subsistence harvest surveys conducted in Noorvik, Shungnak, and White Mountain in spring 2010. Since 1999, the Alaska Department of Fish and Game Division of Subsistence, with support from the Division of Wildlife Conservation, has conducted this limited-scope harvest survey in communities within game management units 22 and 23 that harvest from the Western Arctic caribou herd. The survey asked household heads in Noorvik and Shungnak about their harvests of caribou, moose, other large land mammals, and furbearers between March 2008 and February 2009; in White Mountain, questions asked about the time period between June 2008 and May 2009. The survey documented the number, sex, and harvest timing of these subsistence resources, as well as observations, if any, of unhealthy animals. Reported results were expanded to account for unsurveyed households. In the 2008–2009 study year, Noorvik hunters harvested an estimated 767 caribou, approximately 174 edible pounds of caribou per person. In Shungnak, hunters harvested an estimated 416 caribou, 223 pounds per person. White Mountain's estimated harvest was 99 caribou, about 69 pounds per person.

Key words: caribou, moose, brown bears, Dall sheep, muskoxen, furbearers, Noorvik, Shungnak, White Mountain, WACH, Western Arctic caribou herd, subsistence hunting.

INTRODUCTION

Caribou *Rangifer tarandus* are an important subsistence resource for communities in the Northwest, Arctic and Interior regions of Alaska. People from more than 40 villages, from Wainwright in the north to Kotlik in the south, as well as from the regional centers of Barrow, Kotzebue, and Nome, are known to harvest caribou from the Western Arctic caribou herd (WACH; Figure 1). This herd, which roams throughout an area of 190,000 square miles, is the largest caribou herd in Alaska, with a revised estimated 2009 population of 348,000 animals[1].

The role of caribou in the nutritional, cultural, and economic health of northwestern Alaskan communities varies. In some communities, caribou meat is a large portion of the total subsistence harvest each year. In communities where other resources are more abundant, caribou may represent a smaller portion of the total subsistence harvest. Because of a village's location, residents may have only occasional access to the WACH. In villages located along key migration routes, residents might take caribou during several months of the year. A variety of other factors may also influence caribou harvests each year, including gasoline prices, user conflicts, weather, the success (or lack thereof) in harvesting other subsistence resources, migration timing, and so forth. Subsistence harvesters adapt to local conditions. Therefore, inter-annual variation in harvest numbers and characteristics is not uncommon, even within a single village.

It is the statutory responsibility of the Alaska Department of Fish and Game (ADF&G) Division of Subsistence to provide information to the public, agencies, the Board of Fisheries, and the Board of Game about the role of subsistence hunting and fishing in the lives of Alaska residents (AS 16.05.094). The division studies and reports on the seasonality, methods, sharing and trading, use areas, cultural and economic values, and trends of subsistence harvests and uses. This information is increasingly necessary as development projects are proposed throughout rural areas of Alaska. Documenting and understanding subsistence harvests is also necessary in order to evaluate reasonable opportunities for customary and traditional uses of wild resources. Other duties of the division set forth in statute include:

- Quantifying the amount, nutritional value, and extent of dependency on foods acquired through subsistence hunting and fishing;
- Evaluating the impacts of state and federal laws and regulations on subsistence hunting and fishing, and when corrective action is indicated, making recommendations to the department; and

1. State of Alaska, Department of Fish and Game, "Western Arctic Caribou Herd Count Revisited," press release, March 24, 2011.

- Making recommendations to the Board of Game and the Board of Fisheries regarding adoption, amendment, and repeal of regulations affecting subsistence hunting and fishing.

Subsistence harvest surveys of varying scope have been conducted in over 200 Alaska communities since the division was formed in 1980. This research helps ADF&G estimate subsistence harvests and understand the role of subsistence in local economies. Since 1999, ADF&G, in cooperation with the Maniilaq Association and Kawerak, Inc., has gathered big game harvest information in selected Kotzebue and Norton Sound area communities each year.

METHODS

THE SURVEY EFFORT IN 2009

In 2009, division staff collected subsistence harvest information in 3 communities in the Kotzebue Sound and Bering Strait regions: Noorvik, Shungnak, and White Mountain. See Appendix A for the survey form. All data were processed and analyzed by the division. Survey data were expanded to account for unsurveyed households. Funding for this big game survey came from ADF&G's Division of Wildlife Conservation.

Survey timing was designed to coincide with the end of a major harvest period. Shungnak and Noorvik households were asked about their harvest of caribou, other large game, and furbearers between March 2008 and February 2009. In White Mountain, which is located in the herd's winter range, the survey covered the time period between June 2008 and May 2009.

The division's policy is to seek community approval before conducting local research. Community approval from the traditional councils of Shungnak and Noorvik was obtained by the Maniilaq Association. The Division of Subsistence worked directly with the White Mountain Traditional Council and received community approval for the project. Nicole Braem (Division of Subsistence) and Hazel Smith (Maniilaq Association) traveled to Shungnak and Noorvik in late February 2009, where they trained local surveyors and helped administer surveys. One local resident, Sally Custer, was hired in Shungnak to update the household list and complete surveys. Marla Stone and William T. Fields were hired in Noorvik. In May 2009, Braem traveled to White Mountain and coordinated with Harvey T. Agloinga and Robert Apok, III, who reviewed household lists and conducted surveys there.

Sample achievement was high in all 3 communities (Table 1): 85% of Shungnak households, 85% of Noorvik households, and 94% of White Mountain households were surveyed.

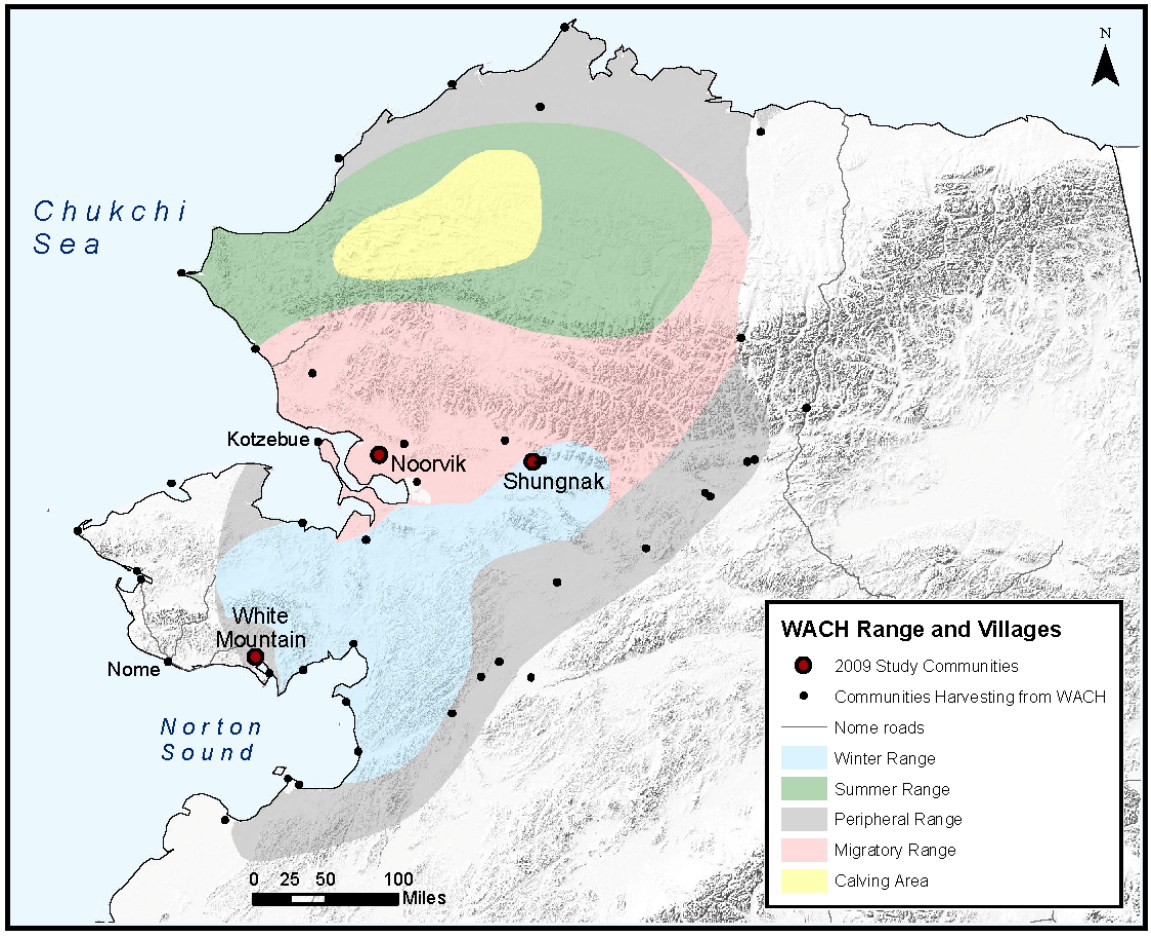

Figure 1.–Western Arctic caribou herd range and 2009 study communities.

SURVEY DESIGN IN 2009

The division's standard method for collecting harvest information in smaller communities is to attempt to survey every household, usually by talking to the head or heads of each household. Confidentiality is protected by using randomly assigned household numbers instead of names on the survey form. Before starting the project, survey workers compile an updated, accurate list of every household present in the community during the study period. Participation in surveys is voluntary—people may refuse to answer any or all questions. Surveyors try to contact each household on 3 separate occasions. If no contact is made, then that household is recorded as "no contact" on the survey form. There are a variety of reasons that a household is marked "no contact:" they may be out of town during the survey effort, they may have moved to another community, or the household members may have passed away during or after the study year. Surveyors often go door to door, but can make appointments for surveys when necessary.

The big game survey used in 2009 gathered demographic information on the number of people living in each household, the age of its members, the relationship between its head(s) and others living there, how many years each person had lived in the community, and whether members were Alaska Native (Table 1).

The survey (Appendix A) included questions about harvests and uses of caribou, moose *Alces alces*, brown bears *Ursus arctos*, Dall sheep *Ovis dalli*, muskoxen *Ovibos moschatus*, and several furbearers. It also asked about sharing (i.e., if a household gave away a resource to other households or if the household received it). Harvest location was recorded by ADF&G Division of Wildlife Conservation uniform coding unit (UCU). These units are geographical areas that can vary in size from just a few square miles to over

11,000 square miles. Respondents were asked about the locations of harvests, the sexes of harvested animals, and the months in which harvests occurred. Respondents were also asked if any members of their household harvested animals with diseases or other physical abnormalities. Surveys typically took 5–10 minutes to administer.

Table 1.–Demographic characteristics of households, Noorvik, Shungnak and White Mountain, 2009.

	Community			
Characteristics	Noorvik	Shungnak	White Mountain	Total
Sampled households	123	44	61	228
Eligible households	144	52	65	261
Percentage sampled	85.4%	84.6%	93.8%	87.4%
Household size				
Mean	4.2	5.1	3.0	4.0
Minimum	1.0	1.0	1.0	1.0
Maximum	15.0	15.0	9.0	15.0
Age				
Mean	27.7	28.6	29.9	28.4
Minimum[a]	0.0	0.0	0.0	0.0
Maximum	88.0	83.0	96.0	96.0
Median	21.0	20.0	25.0	21.0
Sex				
Estimated male				
Number	339.3	127.0	108.2	574.6
Percentage	56.5%	50.2%	55.5%	54.8%
Estimated female				
Number	261.3	125.9	86.8	473.9
Percentage	43.5%	49.8%	44.5%	45.2%
Alaska Native				
Estimated households[b]				
Number	131.1	47.3	55.4	233.8
Percentage	91.1%	90.9%	85.2%	89.6%
Estimated population				
Number	572.4	248.2	166.1	986.6
Percentage	95.3%	98.1%	85.2%	94.1%

Source ADF&G Division of Subsistence household surveys, 2009.

a. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.

b. The estimated number of households in which at least one head of household is Alaska Native.

ANALYSIS

Since its establishment in 1978, the Division of Subsistence Information Management (IM) team has adopted standards based on observations and findings to analyze subsistence harvest resource data. The base unit for the majority of surveys is the household. IM generates harvest estimates and participation rates at the community level. The statistical program SPSS[2] is used to analyze data and prepare tables.

Results from surveyed households were entered into the division's data repository in MS SQL Server. Each survey was entered two times by different staff. As the first step in data validation, the two versions were compared and corrected according to the actual values recorded on paper surveys. Once entered and validated, data were then extracted using SPSS v19.0 and analyzed using standard division methods. Harvest amounts and demographic information were extrapolated to un-surveyed households to derive total harvest and human population estimates for each community. Fractional estimates are the direct result of this expansion procedure and are rounded to the nearest tenth in accompanying report tables. Participation levels, presented in percentages, are derived directly from the sampled data and are assumed to be the same as estimated participation levels for the entire community.

The standard division procedure for estimates of harvests and population in this study were calculated based upon the application of weighted means (Cochran 1977). This method applies the sample mean as a replacement value for each of the households surveyed. The sample mean is also applied for instances where data is not known, but is known to be a value other than zero. The formula applied for this method is

$$X_C = \frac{N}{n}\sum_{i=1}^{n} x_i$$

Where:

x = household harvest

i = ith household in the community

n = number of sampled households in the community

N = number of households in the community

X_C = total estimated community harvest

In addition to harvest estimates, the division reports confidence intervals (CI) to provide some context to the quality and accuracy of the sample. This value represents the relative precision of the mean, or likelihood that an unknown value falls within a certain distance from the mean. In the accompanying tables, the CI is expressed as a percent and applies to both the mean household harvest and total community harvest. The division standard is to use a 95% confidence interval. The formula applied to produce this value is

$$C.I.\%(\pm) = \frac{t_{\alpha/2} \times s_{\bar{x}}}{\bar{x} \times \sqrt{n}} \times \sqrt{\frac{N-n}{N-1}}$$

Where:

$t_{\alpha/2}$ = *Student's t* statistic for given alpha level (α) with n-1 degrees of freedom

2. Product names are given because they are standards for the State of Alaska, or for scientific completeness; they do not constitute product endorsement.

The commonly accepted standard is to use 1.96; however, for very small populations (fewer than approximately 140 residents), the appropriate value must be identified from a look-up table.

s = the sample standard deviation

$\overline{x}$ = sample mean for the community

n = sample size for a community

N = total households in a community

RESULTS

CARIBOU

High percentages of households reported uses of caribou during the study period: 94% in Noorvik, 95% in Shungnak, and 85% in White Mountain (Table 2). Higher percentages of households reported hunting for and harvesting caribou in Noorvik and Shungnak, both of which are located in the core of the WACH range. Household hunting success rates (the number of households attempting to harvest a resource divided by the number of households harvesting) were high in both villages: 100% and 94%, respectively. This rough measure of "success" does not, however, account for effort—the number of trips made, instances of trips made with no harvest, the distance traveled, and the amount spent on gasoline and other supplies. In White Mountain, a lower percentage of households hunted caribou (46%), and 33% harvested, which was a 71% success rate. The prevalence of sharing of subsistence food accounts for the difference between harvest and uses in all 3 study communities.

Table 2.–Estimated harvest and uses of caribou, Noorvik, Shungnak, and White Mountain, 2008–2009.

	Percentage of households reporting					Estimated harvests			95% confidence
Community	Use	Attempt	Harvest	Give	Receive	Total	Mean household	Per capita pounds	limit (±) harvest
Noorvik	94%	70%	70%	37%	56%	767	5.3	173.6	7.7%
Shungnak	95%	73%	68%	45%	61%	416	8.0	223.5	12.8%
White Mountain	85%	46%	33%	34%	70%	99	1.5	69.1	8.9%

Source ADF&G Division of Subsistence household surveys, 2009.

Noorvik, the largest community of the three with an estimated 2008 population of 601, also harvested the most caribou, 767 (Table 2). Shungnak, with less than one-half the number of residents as Noorvik, harvested 416, and White Mountain harvested 99. Shungnak's harvest estimate for the study period may be low, however, because 2 households identified as consistent hunting households were not available to be surveyed.

Looking at per capita harvests allows one to compare the results from communities of different sizes, as well as results for one community over time. By that measure, Shungnak harvested the most caribou in the study period, approximately 223 lb of caribou per resident (Table 2). In contrast, Noorvik's per capita harvest was 174 lb and White Mountain's per capita harvest was an estimated 69 lb. Detailed information on harvest and uses of caribou and all other resources in the survey is available in Appendix B.

The percentage of harvest made up of bulls and cows varied by community, as did harvest timing. The majority of Noorvik's harvest (73%) was bulls, followed by 15% cows and 12% unknown sex. Shungnak's harvest was split: 49% were cows, 42% were bulls, and 9% were unknown sex. Just 3% of

White Mountain's harvest was cows, with 71% bulls and 26% of unknown sex. For a complete breakdown of harvest by sex and month, see Appendix C.

Both Noorvik and Shungnak harvested caribou during all months of the year except June and July; distribution of harvest among those months differed. Noorvik took at least 56% of its total annual harvest in fall (August through October), but respondents could not recall the harvest month for 31% of the animals reported taken (Figure 2).

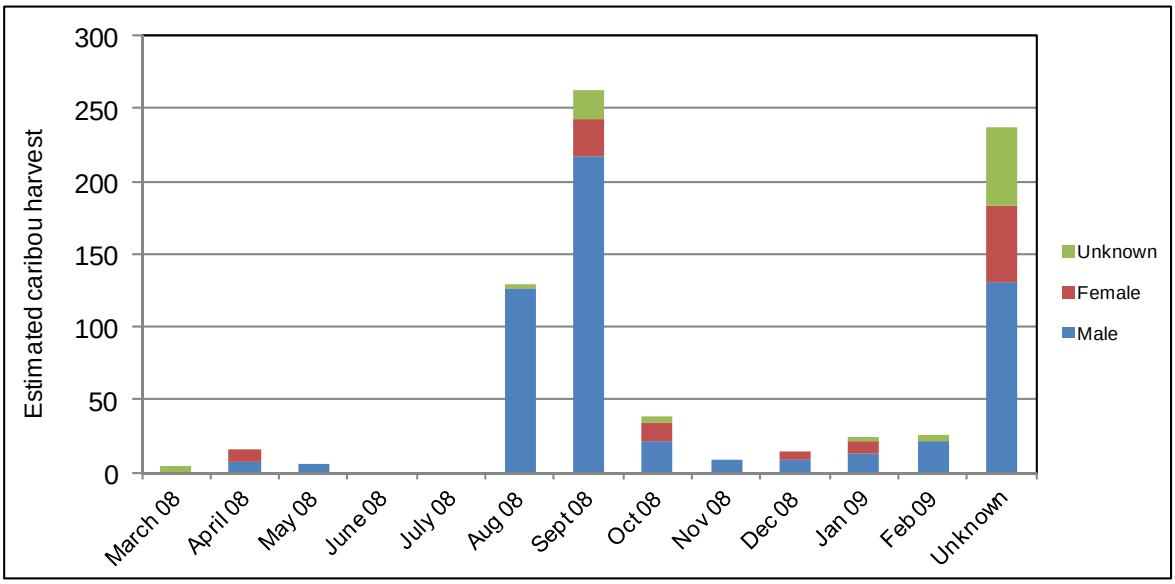

Figure 2.–Estimated caribou harvest by month, Noorvik, 2008–2009.

In contrast to Noorvik, Shungnak's harvest was spread out more evenly during the year, with 20% taken between March and May 2008, 18% taken in the fall, and 37% in the first 4 months of winter (Figure 2). Those surveyed could not recall the month of harvest for 24% (101 caribou). The majority of White Mountain's caribou harvest, 70%, came in the months of March and April, with 13% between November and January (Figure 4). Caribou with unknown month of harvest totaled just 17%.

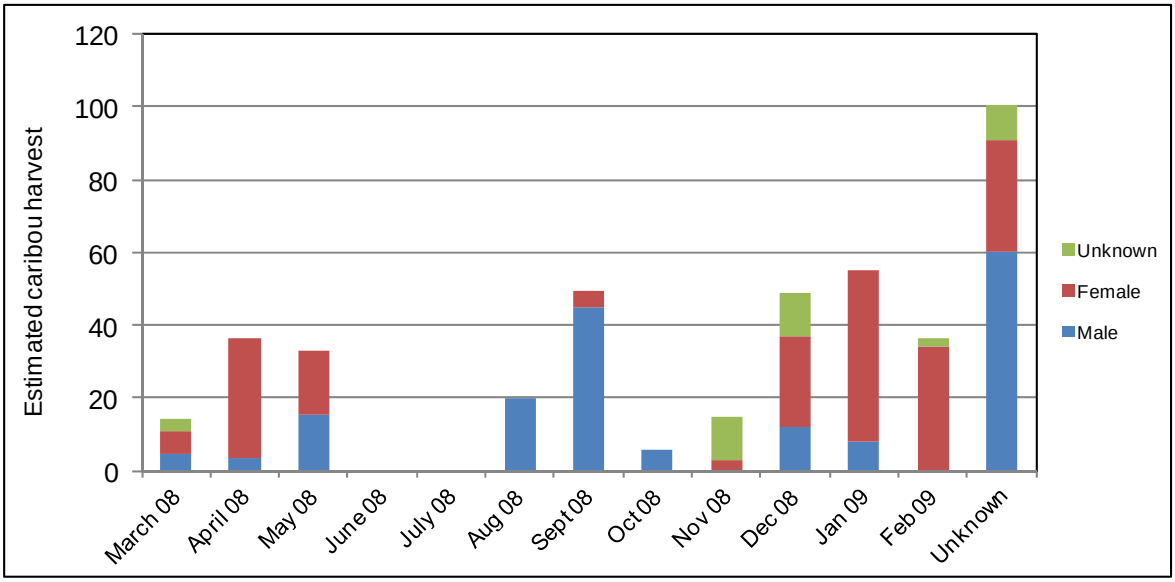

Figure 3.–Estimated caribou harvest by month, Shungnak, 2008–2009.

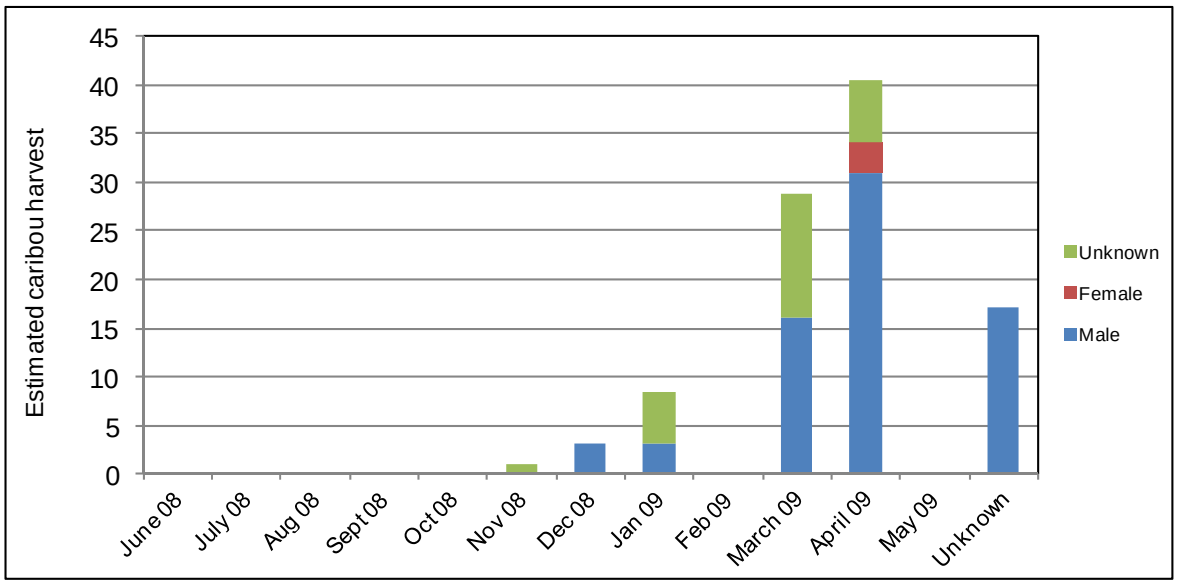

Figure 4.–Estimated caribou harvest by month, White Mountain, 2008–2009.

Uncertainty about month of harvest can occur for several reasons: the length of the study period, the time between harvest of animals and survey administration, the sheer number of animals harvested by a particular hunter or household (in the case of caribou), and which member of the household answers the survey questions. Surveyors attempt to speak to the hunter(s), but at times they are unavailable and another member of the household is surveyed. An example of this situation is when a hunter is out of town during the survey but his wife can report how many caribou he harvested, although not recall exactly the sex of the animal or the exact month it was harvested. Often, season of harvest (for example, fall) is the most detail that can be obtained, in which case the month is recorded as "unknown."

Reported incidences of caribou harvested but judged too unhealthy to eat ranged from 15 caribou (2.3% of total harvest) in Noorvik to 10 caribou (2.9%) in Shungnak. No White Mountain households reported harvesting caribou that were too sick to eat. Unhealthy symptoms included animals that were "too skinny," had broken legs, had joints with pus, and had too many warble flies under the skin. A complete list of symptoms and general comments is presented in Appendix D.

Caribou harvest took place in 12 UCUs near the study communities in 2008. Harvest by location is broken down by community in Appendix E. The following summary maps (figures 5–7) show the estimated caribou harvests of Noorvik, Shungnak, and White Mountain for each area; each community tended to harvest most heavily from the areas nearest the village.

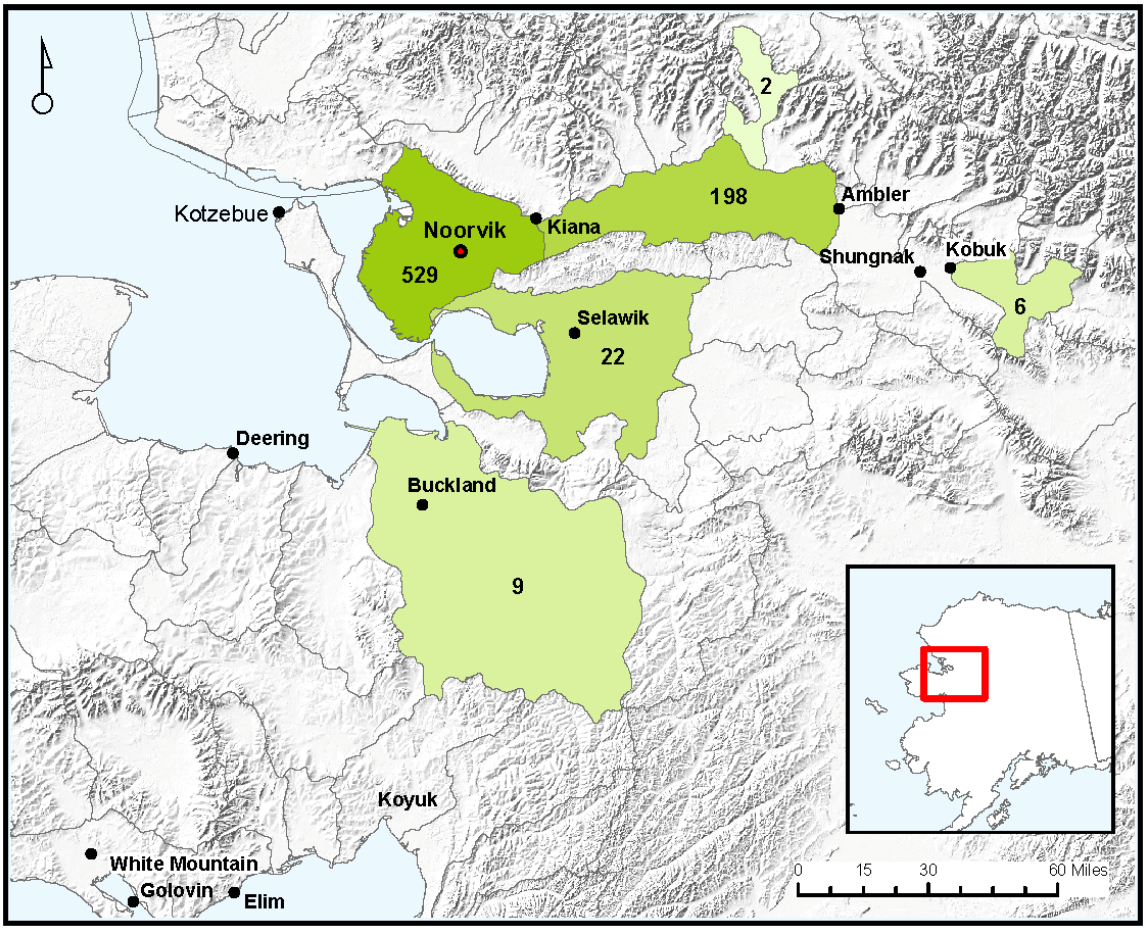

Figure 5.–Estimated caribou harvest by location, Noorvik, 2008–2009.

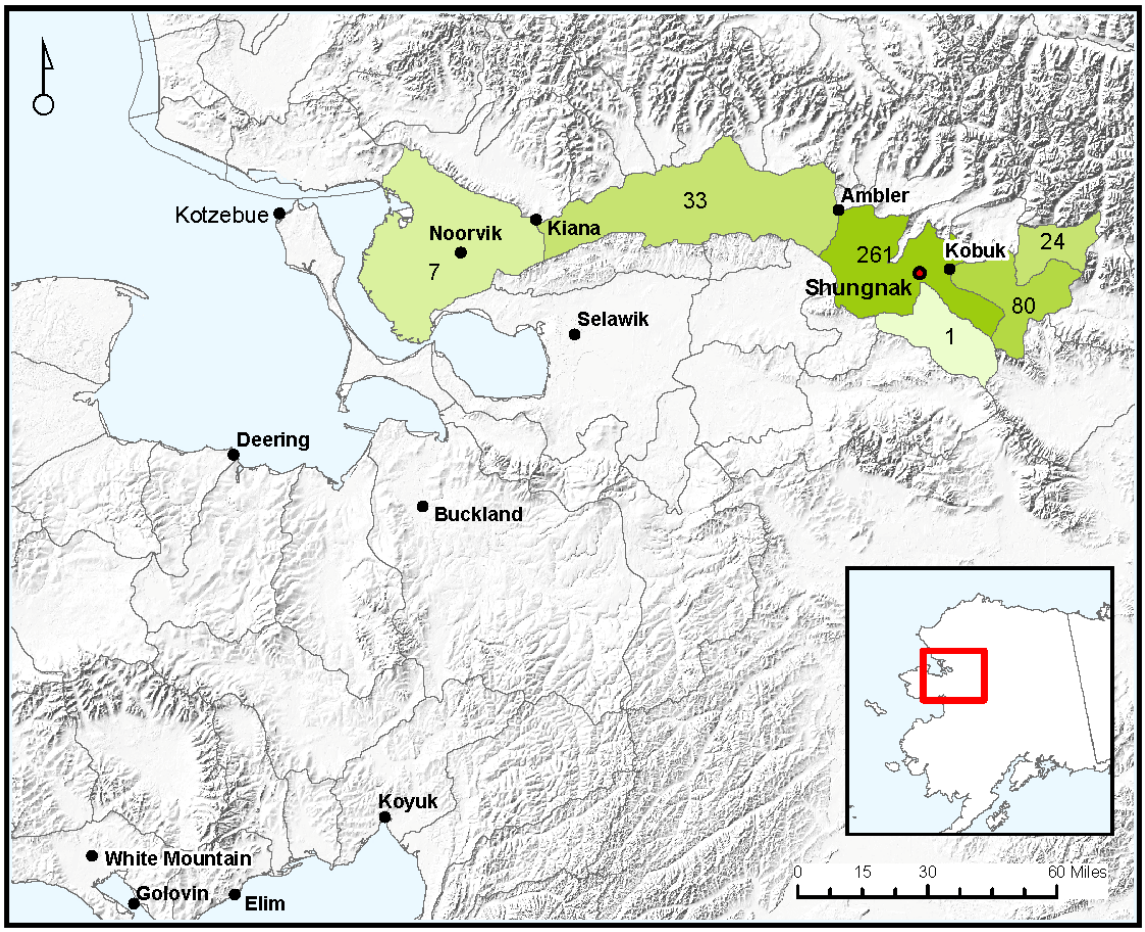

Figure 6.–Estimated caribou harvest by location, Shungnak, 2008–2009.

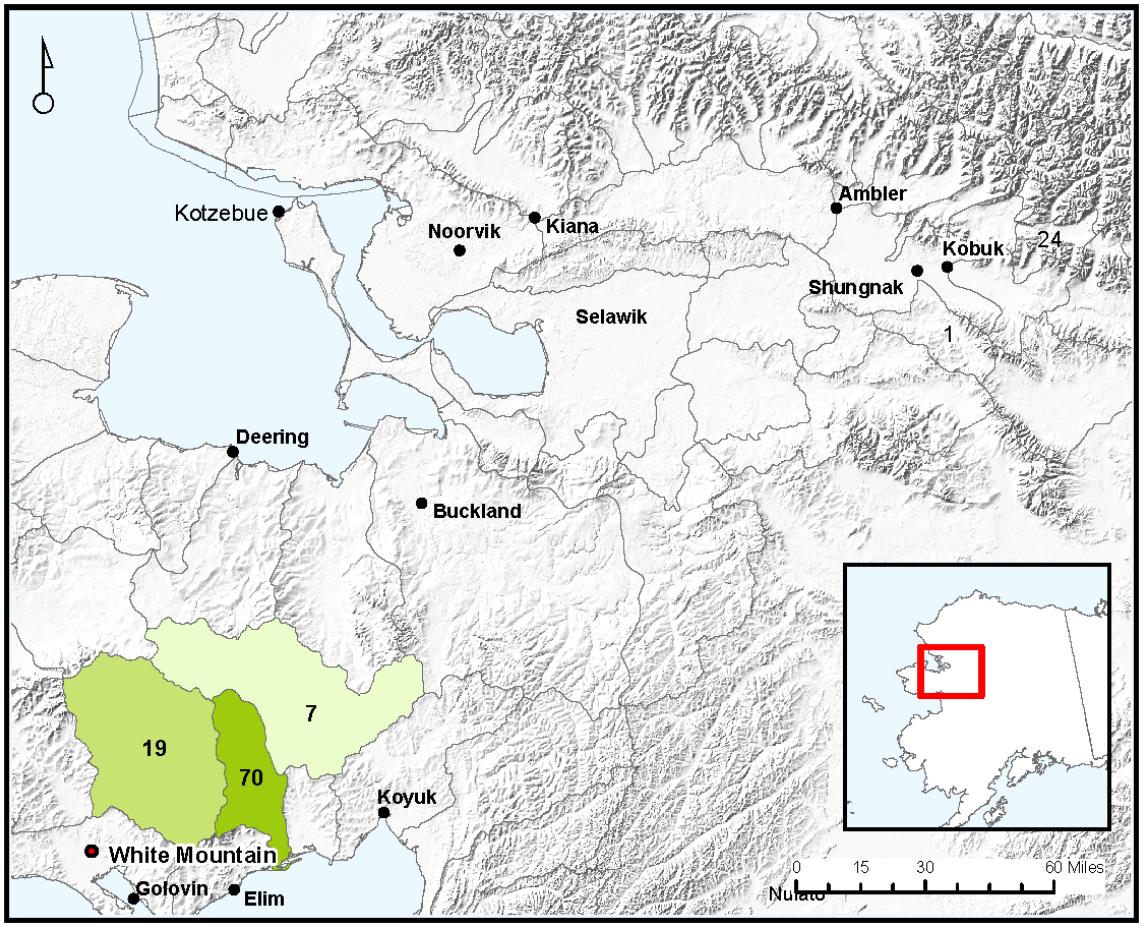

Figure 7.–Estimated caribou harvest by location, White Mountain, 2008–2009.

MOOSE AND OTHER BIG GAME

Uses of moose by Noorvik and Shungnak households was much lower than that of caribou, just 37% and 55%, respectively (Table 3). By contrast, very nearly as many White Mountain households reported using moose as caribou (82% versus 85% for caribou). Over one-half of White Mountain households reported hunting moose; just 18% of Noorvik households and 27% of Shungnak households did so. An equal percentage of Shungnak and White Mountain harvested moose (23%), but moose was more widely shared in the latter community. A majority of White Mountain households received moose (70%); 23% did in Noorvik and 34% in Shungnak.

Table 3.–Estimated harvest and uses of moose, Noorvik, Shungnak, and White Mountain, 2008–2009.

	Percentage of households reporting					Estimated harvests			95% confidence
Community	Use	Attempt	Harvest	Give	Receive	Total	Mean household	Per capita pounds	limit (±) harvest
Noorvik	37%	18%	15%	7%	23%	25	0.2	22.0	12.3%
Shungnak	55%	27%	23%	11%	34%	11	0.2	23.5	18.9%
White Mountain	82%	51%	23%	25%	70%	15	0.2	41.2	8.9%

Source ADF&G Division of Subsistence household surveys, 2009.

Estimated moose harvest in the 3 communities in 2008 was 25 in Noorvik, 11 in Shungnak, and 15 in White Mountain. Translated into pounds per person in each community, Noorvik hunters brought home an estimated 22 lb per person; Shungnak, 24; and White Mountain nearly twice that amount, at 41 lb per capita. Noorvik harvested nearly all its moose in the UCU surrounding that community; respondents could not identify a harvest location for 1 moose (Figure 8). Shungnak respondents were unable to recall the harvest location of 1 moose. Shungnak hunters harvested an estimated 5 moose in the area around the village bounded by Ambler downriver and Kobuk upriver. Four moose were killed further upriver past the community of Kobuk. Nearly all moose harvested by White Mountain hunters (12) were taken in the UCU nearest the community. Two were harvested to the north in the area bounding McCarthy Marsh, and 1 was taken to the west in the Solomon River drainage.

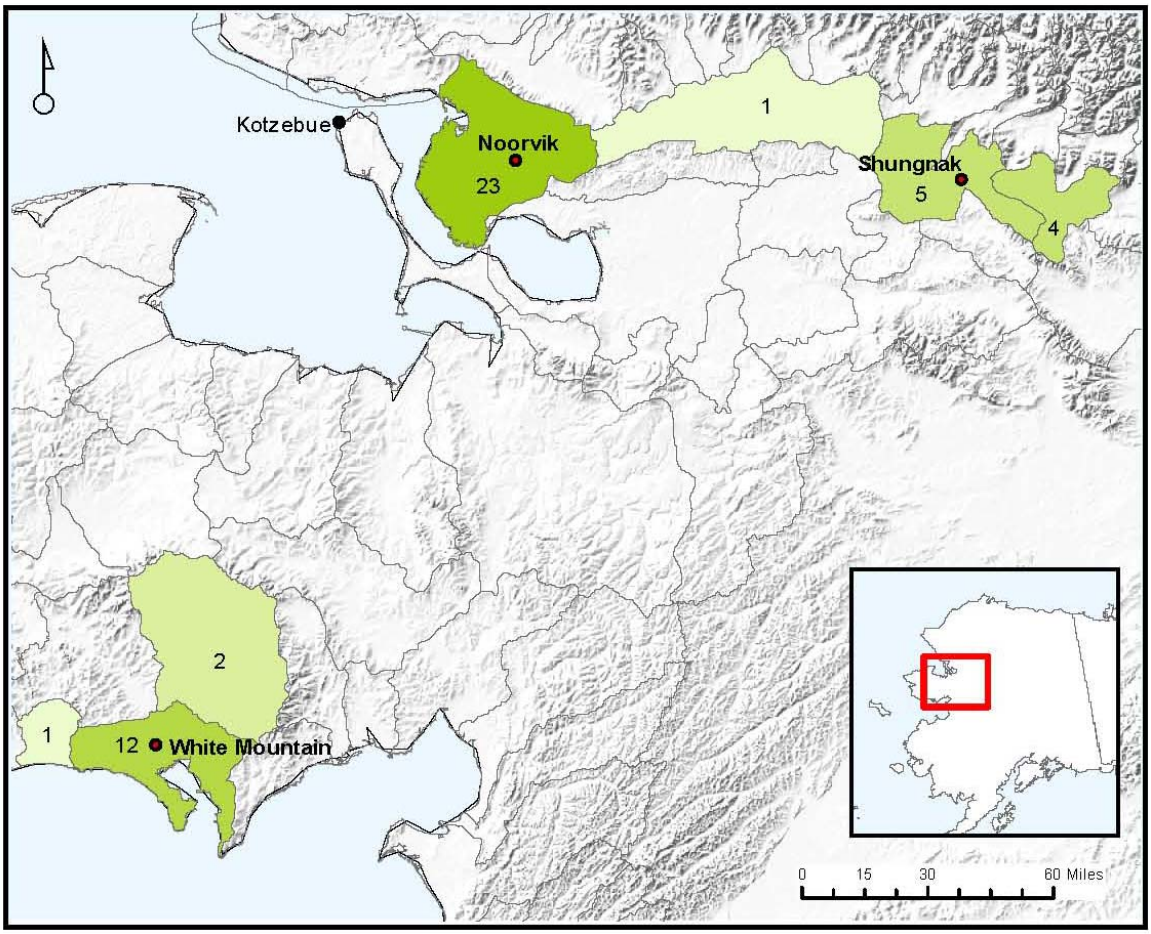

Figure 8.–Estimated moose harvest by location, Noorvik, Shungnak and White Mountain, 2008–2009.

Most moose taken were bulls—neither Shungnak nor White Mountain reported cow harvest. Noorvik took an estimated 2 cows. In the 3 communities combined, 76% of moose were taken in the months August and September (Appendix F).

Harvest of black bears was limited to Shungnak in 2008, with 2 taken. Just 2% of Noorvik households reported use of black bears, presumably shared from another community, and White Mountain reported no uses of black bears. Brown bear uses were minimal in all 3 communities: 2% in Noorvik and White Mountain, and 9% in Shungnak. Just a few households in each community hunted for brown bears, resulting in a harvest of 2 in Noorvik, 2 in Shungnak, and 1 in White Mountain. Harvest of muskoxen occurred only in White Mountain, with an estimated harvest of 4 animals. This estimate differs slightly

from Division of Wildlife Conservation recorded harvest in the same time period (3 animals) based on permit information.(Muskox hunting is managed by permit.).

FURBEARERS

Furbearers were less widely used than caribou and moose in all 3 communities in 2008. Beavers were the most highly used furbearer overall, with 27% of Shungnak households reporting uses, while 12% of Noorvik households and 8% of White Mountain households reporting uses, by comparison. White Mountain had the highest percentage of households using lynx, at 7%. Very little uses of martens, red foxes, or wolverines were reported in any community, with less than 5% of households reporting uses anywhere.

Sharing, documented by the giving away and receiving of a resource, was again highest for beavers. In Shungnak, 11% of households reported giving them away and 2% said they had received some. In Noorvik, 0% reported giving them away, and 3% said they received some. In White Mountain, 2% gave some away and 5% received some.

Noorvik, the largest community in the study, harvested more of all furbearing species than Shungnak and White Mountain, with the exception of wolves; Shungnak harvested an estimated 17 wolves while Noorvik harvested 11. White Mountain reported no harvest of wolves. Noorvik harvested 49 beavers, 33 lynx, 125 martens, 18 red foxes, and 5 wolverines in the study year. Shungnak hunters harvested 39 beavers, 1 marten, and no lynx, red foxes, or wolverines. White Mountain harvested 12 beavers, 5 lynx, 4 foxes, 1 wolverine, and no martens. A full summary of furbearer harvest data appears in Appendix B.

COMPARING THE 2008–2009 RESULTS WITH PREVIOUS SURVEY DATA

2008 was the second year that big game harvest information has been gathered in Noorvik, which was first surveyed in 2003. Both Shungnak and White Mountain had been surveyed twice before since 1999.

Pounds per capita harvest of caribou changed little for Shungnak and Noorvik from the previous study year, as seen in Figure 9 below. However, Shungnak's pounds per capita caribou harvests in 2002 and 2008 were nearly 100 lb less than that documented in 1998. White Mountain's pounds per capita caribou harvest, 69 lb, was nearly twice as much as in 2005, but not substantially different than its 1999 harvest of 60 lb per person.

Noorvik's pounds per capita moose harvest of 22 lb was only one-half as much as in 2002, when hunters brought home 56 moose, which constituted 41 lb of moose per resident. Shungnak's moose harvest was similar to 2002 numbers, when the community took 12 moose and the pounds per person harvest was 23. This was only one-half as much as in 1998, when Shungnak harvested 21 moose for a per capita value of 46 pound per person. White Mountain's moose harvest of 15 animals fell between the 2 previous data points. In 1999, the community took 17 moose and 12 in 2005. The per capita harvest ranged from 43 lb in 1999 to 33 lb in 2005 and 41 lb in 2008. For a more detailed comparison of data from previous study years for each village, see Appendix H.

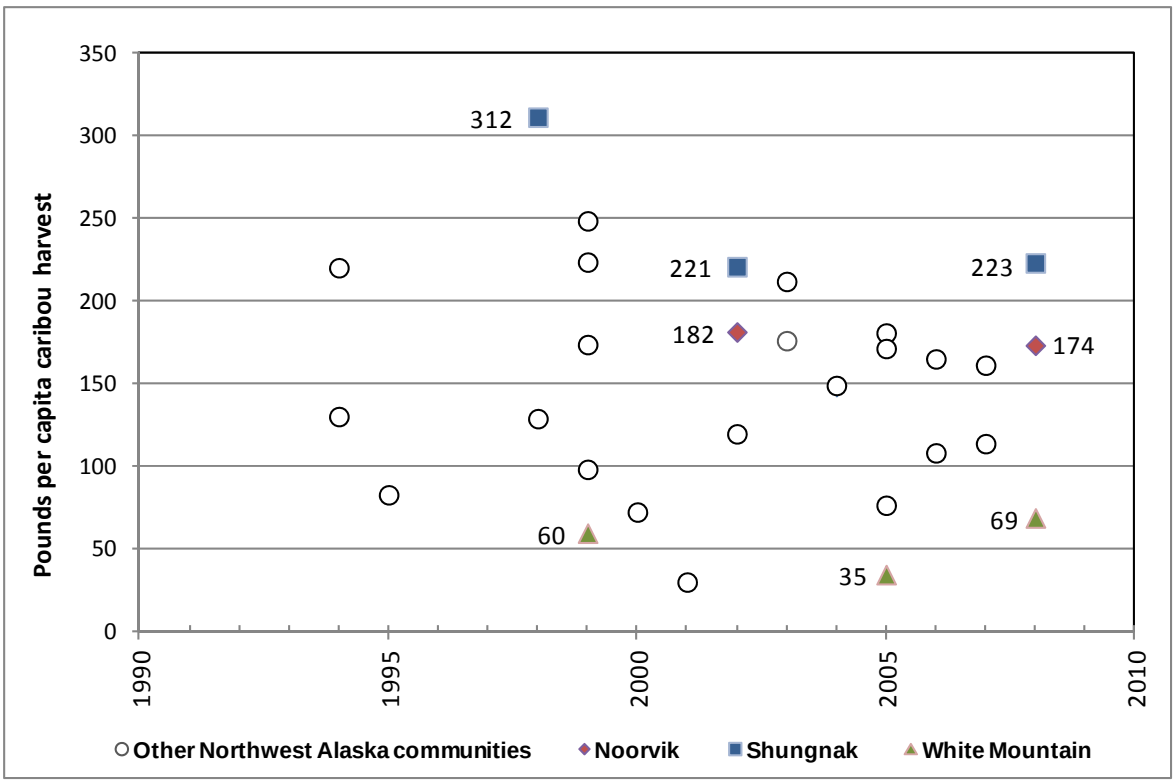

Figure 9.–Comparison of caribou harvests by pounds per capita, Kotzebue region.

ACKNOWLEDGEMENTS

The Alaska Department of Fish and Game and the Maniilaq Association are grateful to the residents of Noorvik, Shungnak, and White Mountain for participating in this project and their courtesy to and patience with those administering surveys. Special thanks go to Hendy Ballot at the Native Village of Noorvik, Judy Lee at the Native Village of Shungnak, and Dorothy Barr at the Native Village of White Mountain, as well as Hazel Smith, formerly of Maniilaq Association, for coordinating travel and lodging and obtaining community approval. Funding for this project has been provided since 1999 by the ADF&G Division of Wildlife Conservation.

For further information, please contact:

Enoch Shiedt	Nicole M. Braem	James Magdanz
Maniilaq Association	ADF&G Division of Subsistence	ADF&G Division of Subsistence
P.O. Box 256	1300 College Rd.	P.O. Box 689
Kotzebue, AK 99752	Fairbanks, AK 99701	Kotzebue, AK 99752
(907) 442-7690	(907) 328-6106	(907) 442-3420

REFERENCES CITED

Cochran, W. G. 1977. Sampling techniques. 3rd edition. John Wiley & Sons, New York.

APPENDICES

APPENDIX A: WHITE MOUNTAIN SURVEY FORM

WESTERN ARCTIC CARIBOU HERD SUBSISTENCE SURVEY

WHITE MTN., ALASKA

JUNE 2008 to MAY 2009

COOPERATING ORGANIZATIONS

DIVISION OF SUBSISTENCE
ALASKA DEPT OF FISH & GAME
1300 COLLEGE RD.
FAIRBANKS, AK 99701

(907)459-7200

WHITE MOUNTAIN IRA COUNCIL
P.O. BOX 84082

WHITE MOUNTAIN, AK 99784

(907) 638-3652

We are doing this survey to better understand subsistence in Alaska. Similar surveys have been conducted in more than 100 Alaska communities, including Deering, Buckland, Kotzebue, Kivalina, Noatak, Shungnak, Shishmaref, and Wales. Surveys help us estimate subsistence harvests. Surveys also help us describe the role of subsistence in Alaska's economy.

The survey asks how much game your household harvested last year, and for any observations you may have about the health of game you harvested.

It also asks about who lived in your household and their age(s). We will NOT identify your household. We will NOT use this information for enforcement. Participation in this survey is voluntary. If you start a survey, you may stop at any time.

HOUSEHOLD ID:		
COMMUNITY ID:	WHITE MTN.	367
RESPONDENT ID:		
INTERVIEWER:		
INTERVIEW DATE:		
START TIME:		
STOP TIME:		
DATA CODED BY:		
DATA ENTERED BY:		
SUPERVISOR:		

HOUSEHOLD MEMBERS

HOUSEHOLD ID

First, I would like to know a few things about the people in your household. I want to know only about permanent members of your household, including college or high school students who return home every summer. I am NOT interested in people who lived with you temporarily, even if they stayed several months.

Between JUNE 2008 to MAY 2009...
...who lived in your household?

ID#	How is this person related to head 1? *relation*	Is this person MALE or FEMALE? *circle*	How old is this person? *age*	Is this person Alaska Native? *circle*	Is this person answering questions *on this survey?* *circle*	Comments *enter text*
HEAD 1	SELF	M F		Y N	Y N	
01	1					
NEXT, enter spouse or partner (including "play wife" or "play husband"). If household has a SINGLE HEAD, leave HEAD 2 blank.						
HEAD 2	SPOUSE	M F		Y N	Y N	
02	2					
BELOW, enter children (oldest to youngest), grandchildren, grandparents, brothers, sisters, and other household members.						
03		M F		Y N	Y N	
04		M F		Y N	Y N	
05		M F		Y N	Y N	
06		M F		Y N	Y N	
07		M F		Y N	Y N	
08		M F		Y N	Y N	
09		M F		Y N	Y N	
10		M F		Y N	Y N	
11		M F		Y N	Y N	
12		M F		Y N	Y N	
13		M F		Y N	Y N	
14		M F		Y N	Y N	
15		M F		Y N	Y N	
16		M F		Y N	Y N	

PERMANENT HH MEMBERS: 01 **WHITE MTN.: 367**

HARVESTS: LARGE LAND MAMMALS

HOUSEHOLD ID

Now I am going to ask about large land mammals such as caribou, moose, and bear.
Do members of your household USUALLY hunt large land mammals for subsistence?..... Y N

Between JUNE 2008 to MAY 2009…
…Did members of your household USE or TRY TO CATCH large land mammals?..... Y N

IF NO, go to the next harvest page.
If YES, continue on this page…

Please estimate how many large land mammals ALL MEMBERS OF YOUR HOUSEHOLD CAUGHT for subsistence use last year. INCLUDE large land mammals you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting or trapping with others, report ONLY YOUR SHARE of the catch.

	In 2008, did your household…				In 2008, where did members of your HH catch _____? *Each line is for 1 area, 1 sex, 1 amount, and 1 month. Four bulls killed in the same area in September should be on the same line. A cow killed in the same area would be on a new line. Do not enter the same animal in two lines!*			
	Use?	Try to Harvest?	Give Away?	Receive?	WHERE were they harvested?	Were these MALE or FEMALE?	HOW MANY animals were killed?	In what MONTH were these animals harvested?
	circle one				*enter UCU*	*circle one*	*enter number*	*enter one month*
CARIBOU *Tuttu*	Y N	Y N	Y N	Y N		BULL COW ?		
211000000								
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		

large land mammals contintued on next page…

LAND MAMMALS: 10 **WHITE MTN.: 367**

HARVESTS: LARGE LAND MAMMALS *(continued)*

HOUSEHOLD ID

	In 2008, did your household...				In 2008, where did members of your HH catch _____? *Each line is for 1 area, 1 sex, 1 amount, and 1 month. Four bulls killed in the same area in September should be on the same line. A cow killed in the same area would be on a new line. Do not enter the same animal in two lines!*			
	Use?	Try to Harvest?	Give Away?	Receive?	WHERE were they harvested?	Were these MALE or FEMALE?	HOW MANY animals were killed?	In what MONTH were these animals harvested?
	circle one				enter UCU	circle one	enter number	enter one month
MOOSE *Tinniikaq* 211800000	Y N	Y N	Y N	Y N		BULL COW ?		
						BULL COW ?		
						BULL COW ?		
						BULL COW ?		
GRIZZLY BEAR *Aklaq* 210800000	Y N	Y N	Y N	Y N		BOAR SOW ?		
						BOAR SOW ?		
						BOAR SOW ?		
BLACK BEAR *Iyyagriq* 210600000	Y N	Y N	Y N	Y N		BOAR SOW ?		
						BOAR SOW ?		
						BOAR SOW ?		
DALL SHEEP *Ipnaiq* 212200000	Y N	Y N	Y N	Y N		RAM EWE ?		
						RAM EWE ?		
						RAM EWE ?		
MUSKOXEN *Uminmak* 212000000	Y N	Y N	Y N	Y N		BULL COW ?		
						BULL COW ?		
						BULL COW ?		

LAND MAMMALS: 10 **WHITE MTN.: 367**

HARVESTS: FURBEARERS

HOUSEHOLD ID

This page asks about furbearers such as wolf, wolverine, and beaver.
Do members of your household USUALLY hunt or trap furbearers for subsistence? ..... Y N

Between JUNE 2008 to MAY 2009…
…Did members of your household USE or TRY TO CATCH furbearers? ..... Y N

IF NO, go to the next page.
If YES, continue on this page…

Please estimate how many furbearers ALL MEMBERS OF YOUR HOUSEHOLD for subsistence use last year. INCLUDE furbearers you gave away, ate fresh, lost to spoilage, or got by helping others. If hunting or trapping with others, report ONLY YOUR SHARE of the catch.

	In 2008, did your household…				How many did your HH use for FUR ONLY?	Comments?
	Use?	Try to Harvest?	Give Away?	Receive?		
	circle one				enter number	enter text
WOLF *Amaguq* 223200000	Y N	Y N	Y N	Y N		
WOLVERINE *Qapvik* 223400000	Y N	Y N	Y N	Y N		
MARTEN *Qapvaitchaiq* 222000000	Y N	Y N	Y N	Y N		
LYNX *Nuutuuyiq* 221600000	Y N	Y N	Y N	Y N		
RED FOX *Kayuqtuq* 220804000	Y N	Y N	Y N	Y N		

	In 2008, did your household…				In 2008, how many _____ did members of your HH catch?			
	Use?	Try to Harvest?	Give Away?	Receive?	did your HH use for FUR ONLY?	did your HH use for FOOD?	TOTAL HARVEST?	Comments
	circle				enter number	enter number	sum of all harvests	enter text
BEAVER *Paluqtaq* 220200000	Y N	Y N	Y N	Y N				

FURBEARERS: 14 **WHITE MTN.: 367**

WILDLIFE HEALTH

HOUSEHOLD ID

BETWEEN JUNE 2008 to MAY 2009, did anyone in your household KILL but NOT EAT any animals because they did not seem healthy?..... Y N

If NO, go to the next page...

*If **YES**, continue on this page...*

What kinds of animals did not seem healthy?

List each species separately. If the household reports two or more different problems for a single species, use a separate row for each problem.

Species	What was wrong?	How many animals had this problem?	Units	Did you include these animals in the numbers you gave me before?	Have you ever seen problem in past years?
enter name	*describe the symptom*	*number*	*ind, gals...*	*circle one*	*circle one*
	SYMPTOM			Y N	Y N
	SYMPTOM			Y N	Y N
	SYMPTOM			Y N	Y N
	SYMPTOM			Y N	Y N
	SYMPTOM			Y N	Y N
	SYMPTOM			Y N	Y N
	SYMPTOM			Y N	Y N

COMMENTS:

ABNORMALITIES: 27 **WHITE MTN.: 367**

COMMENTS **HOUSEHOLD ID**

DO YOU HAVE ANY QUESTIONS, COMMENTS, OR CONCERNS?

INTERVIEW SUMMARY:

BE SURE TO FILL IN THE STOP TIME ON THE FIRST PAGE!!!!

COMMENTS: 30 **WHITE MTN.: 367**

APPENDIX B: HARVESTS AND USES OF WILD RESOURCES, NOORVIK, SHUNGNAK, WHITE MOUNTAIN, 2008–2009

Appendix B-1.–Estimated harvests and uses of wild resources, Noorvik, Alaska, 2008–2009.

Resource name	Percentage of households					Harvest weight, pounds[a]			Harvest quantity, individual		95% CI (±%)
	Use	Attempt	Harvest	Give	Receive	Total	Per household	Per capita	Total	Per household	
Land mammals	**95.1%**	**70.7%**	**70.7%**	**37.4%**	**70.7%**	**118,265.0**	**821.3**	**196.9**	**1,111.0**	**7.7**	**9.2%**
Large land mammals	**95.1%**	**70.7%**	**70.7%**	**37.4%**	**69.9%**	**117,717.1**	**817.5**	**196.0**	**793.8**	**5.5**	**9.2%**
Black bear	2.4%	6.5%	0.0%	0.0%	2.4%	0.0	0.0	0.0	0.0	0.0	0.0%
Brown bear	1.6%	5.7%	1.6%	0.0%	0.0%	201.4	1.4	0.3	2.3	0.0	37.7%
Caribou	94.3%	69.9%	69.9%	36.6%	56.1%	104,288.8	724.2	173.6	766.8	5.3	7.7%
Moose	37.4%	17.9%	15.4%	6.5%	22.8%	13,226.9	91.9	22.0	24.6	0.2	12.3%
Muskox	0.8%	0.0%	0.0%	0.0%	0.8%	0.0	0.0	0.0	0.0	0.0	0.0%
Dall sheep	0.0%	0.8%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0%
Small land mammals	**15.4%**	**15.4%**	**6.5%**	**1.6%**	**4.1%**	**547.9**	**3.8**	**0.9**	**317.3**	**2.2**	**36.8%**
Beaver	12.2%	11.4%	6.5%	0.0%	3.3%	547.9	3.8	0.9	49.2	0.3	36.8%
Red fox	1.6%	2.4%	0.0%	0.8%	0.0%	0.0	0.0	0.0	17.6	0.1	56.2%
Lynx	1.6%	2.4%	0.0%	0.8%	0.0%	0.0	0.0	0.0	32.8	0.2	63.4%
Marten	1.6%	2.4%	0.0%	0.8%	0.0%	0.0	0.0	0.0	125.3	0.9	70.7%
Wolf	4.9%	6.5%	0.0%	0.0%	0.8%	0.0	0.0	0.0	10.5	0.1	36.1%
Wolverine	2.4%	2.4%	0.0%	0.8%	0.8%	0.0	0.0	0.0	4.7	0.0	59.6%

Source ADF&G Division of Subsistence household surveys, 2009.

a. A harvest weight of zero pounds for a resource with a non-zero harvest quantity indicates that the resource was used exclusively for fur, and not eaten.

Appendix B-2.–Estimated harvests and uses of wild resources, Shungak, Alaska, 2008–2009.

Resource name	Percentage of households					Harvest weight, pounds[a]			Harvest quantity, individual		95% CI (±%)
	Use	Attempt	Harvest	Give	Receive	Total	Per household	Per capita	Total	Per household	
Land mammals	**97.7%**	**72.7%**	**72.7%**	**47.7%**	**70.5%**	**63,529.1**	**1,221.7**	**251.2**	**487.0**	**9.4**	**15.1%**
Large land mammals	**95.5%**	**72.7%**	**70.5%**	**47.7%**	**70.5%**	**62,768.6**	**1,207.1**	**248.2**	**430.2**	**8.3**	**15.2%**
Black bear	11.4%	6.8%	4.5%	0.0%	9.1%	156.0	3.0	0.6	1.8	0.0	42.0%
Brown bear	9.1%	9.1%	6.8%	2.3%	4.5%	156.1	3.0	0.6	1.8	0.0	41.0%
Caribou	95.5%	72.7%	68.2%	45.5%	61.4%	56,524.3	1,087.0	223.5	415.6	8.0	12.8%
Moose	54.5%	27.3%	22.7%	11.4%	34.1%	5,932.2	114.1	23.5	11.0	0.2	18.9%
Muskox	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0%
Dall sheep	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0%
Small land mammals	**36.4%**	**29.5%**	**25.0%**	**11.4%**	**6.8%**	**760.5**	**14.6**	**3.0**	**56.7**	**1.1**	**23.2%**
Beaver	27.3%	25.0%	25.0%	11.4%	2.3%	760.5	14.6	3.0	39.0	0.8	23.2%
Red fox	0.0%	2.3%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0%
Lynx	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0%
Marten	2.3%	2.3%	0.0%	0.0%	0.0%	0.0	0.0	0.0	1.2	0.0	80.0%
Wolf	11.4%	9.1%	0.0%	0.0%	6.8%	0.0	0.0	0.0	16.5	0.3	39.0%
Wolverine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0%

Source ADF&G Division of Subsistence household surveys, 2009.

a. A harvest weight of zero pounds for a resource with a non-zero harvest quantity indicates that the resource was used exclusively for fur, and not eaten.

Appendix B-3–Estimated harvests and uses of wild resources, White Mountain, Alaska, 2008–2009.

Resource name	Percentage of households					Harvest weight, pounds[a]			Harvest quantity, individual		95% CI (±%)
	Use	Attempt	Harvest	Give	Receive	Total	Per household	Per capita	Total	Per household	
Land mammals	**88.5%**	**63.9%**	**44.3%**	**44.3%**	**78.7%**	**24,164.6**	**371.8**	**123.9**	**141.8**	**2.2**	**9.2%**
Large land mammals	**88.5%**	**60.7%**	**44.3%**	**44.3%**	**78.7%**	**24,164.6**	**371.8**	**123.9**	**119.4**	**1.8**	**9.2%**
Black bear	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0%
Brown bear	1.6%	3.3%	1.6%	0.0%	0.0%	91.6	1.4	0.5	1.1	0.0	35.1%
Caribou	85.2%	45.9%	32.8%	34.4%	70.5%	13,477.4	207.3	69.1	99.1	1.5	8.9%
Moose	82.0%	50.8%	23.0%	24.6%	70.5%	8,025.9	123.5	41.2	14.9	0.2	8.9%
Muskox	19.7%	9.8%	9.8%	11.5%	13.1%	2,569.7	39.5	13.2	4.3	0.1	17.0%
Dall sheep	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0%
Small land mammals	**18.0%**	**18.0%**	**0.0%**	**3.3%**	**6.6%**	**0.0**	**0.0**	**0.0**	**22.4**	**0.3**	**30.5%**
Beaver	8.2%	6.6%	0.0%	1.6%	4.9%	0.0	0.0	0.0	11.7	0.2	28.4%
Red fox	3.3%	1.6%	0.0%	0.0%	1.6%	0.0	0.0	0.0	4.3	0.1	49.6%
Lynx	6.6%	11.5%	0.0%	1.6%	1.6%	0.0	0.0	0.0	5.3	0.1	32.6%
Marten	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0%
Wolf	3.3%	4.9%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0%
Wolverine	1.6%	3.3%	0.0%	0.0%	1.6%	0.0	0.0	0.0	1.1	0.0	49.6%

Source ADF&G Division of Subsistence household surveys, 2009.

a. A harvest weight of zero pounds for a resource with a non-zero harvest quantity indicates that the resource was used exclusively for fur, and not eaten.

APPENDIX C: ESTIMATED CARIBOU HARVEST BY SEX AND MONTH OF HARVEST, NOORVIK, SHUNGNAK, WHITE MOUNTAIN, 2008–2009

Community	Sex	2008										2009					Unknown	Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May		
Noorvik	Male	0.0	7.0	5.9	0.0	0.0	126.4	217.8	21.1	9.4	8.2	12.9	21.1	–	–	–	131.1	560.8
	Female	0.0	9.4	0.0	0.0	0.0	0.0	24.6	12.9	0.0	5.9	8.2	1.2	–	–	–	52.7	114.7
	Unknown	4.7	0.0	0.0	0.0	0.0	2.3	19.9	4.7	0.0	0.0	3.5	3.5	–	–	–	52.7	91.3
Shungnak	Male	4.7	3.5	15.4	0.0	0.0	20.1	44.9	5.9	0.0	11.8	8.3	0.0	–	–	–	60.3	174.9
	Female	5.9	33.1	17.7	0.0	0.0	0.0	4.7	0.0	3.0	25.4	46.7	34.3	–	–	–	30.7	201.5
	Unknown	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	11.8	0.0	2.4	–	–	–	9.7	39.2
White Mountain	Male	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	3.2	3.2	0.0	16.0	30.9	0.0	17.0	70.3
	Female	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	3.2
	Unknown	–	–	–	0.0	0.0	0.0	0.0	0.0	1.1	0.0	5.3	0.0	12.8	6.4	0.0	0.0	25.6

Source ADF&G Division of Subsistence household surveys, 2009.

– = No data collected. Noorvik and Shungnak study period was March 2008 through February 2009. White Mountain study period was June 2008 through May 2009.

APPENDIX D: HOUSEHOLD ACCOUNTS OF CARIBOU THAT WERE HARVESTED BUT NOT EATEN, NOORVIK, SHUNGNAK, WHITE MOUNTAIN, 2008–2009

Appendix D-1.–Household accounts of caribou that were harvested but not eaten, Noorvik, Shungnak, White Mountain, 2008–2009.

Community	Comments, reasons, or symptoms	Households reporting[a]	Quantity[b]
Noorvik		7	9
Noorvik	Cysts or tumors present	1	1
Noorvik	Other abnormalities	2	3
Noorvik	Poor condition: growth, weight	1	2
Shungnak		7	10
White Mountain		1	0

Source ADF&G Division of Subsistence household surveys, 2009.

a. "Households reporting" indicates the number of households that reported harvesting caribou that was not eaten because it was considered unfit for human consumption.

b. "Quantity" indicates the number of caribou that were harvested by households that was not eaten because it was considered unfit for human consumption.

Appendix D-2.–Additional comments relative to sick animal harvests.

Comments	Community			Total
	Noorvik	Shungnak	White Mountain	
A lot of flies underneath caribou skin.	0	0	1	1
All caught healthy.	1	0	0	1
Can harvest timelines be changed to accommodate migration changes to allow us to hunt "during" migration?	0	1	0	1
Even big males in fall time.	1	0	0	1
First thing I teach my son is leave open gut see what inside. Then split liver open—there are some w/real thick pus. If some clear liquid, okay.	1	0	0	1
Given to them this spring, fall time, though it was very tough around here. Unlucky, only 5 or 6.	1	0	0	1
He says that he has never gotten sick caribou. He got this caribou 2/23/09. He was feeding normal, but when he went to the kill, he found it to have only one eye.	0	1	0	1
I was able to accompany [person] to above Kobuk. I helped her cut about 50 sheefish and was given a share. People in Shungnak also give me tubs of whitefish.	0	1	0	1
Last spring between Shungnak and Kobuk I saw a red fox with no tail with no fur just on the tip. About 3 years ago, I had to go 17 miles out of Buckland to hunt caribou.	0	1	0	1
Listed non-big game (spring–balding head).	0	0	1	1
Look real good. Seen in past, but not that. Right now, different groups. Many are fat ones that have been going back and forth. [Person] could see—eating grass. Come in [person], to south in another tributary? At Kobuk Lake, hundred eating grass.	1	0	0	1
No, but you're making me hungry.	1	0	0	1
Not as fat as used to seeing them.	0	1	0	1
Not only caribou, but other species. We need to meet with Noatak and other tribes—what happens there affects us here. We need to speak w/one voice.	0	1	0	1
Okay, but pus, didn't want to take a chance. A yellow–greenish pus. Some had white spots on liver, never seen them before.	0	1	0	1
Pretty healthy bulls.	1	0	0	1
Seen a lot of wounded, running around	0	2	0	2
Several falls ago young people left about 7 bulls buried perhaps in an effort to hunt bear. No problems w/planes. Two years ago Kotzebue hunters used ATVs near Wolf Creek and diverted caribou towards ORV.	1	0	0	1
Some meat given to us is not good	0	1	0	1
We saw 2 caribou had pus (at different times), 1 had greenish liver. We was lot of whitefish had fungus. We're getting fish with lumps (fungus). [Person]—get info from [person] when people find unhealthy species and where and what to do.	1	0	0	1
We saw one seal between Kiana and Noorvik —2 years in a row. Some meat appear to have something like worms but I cut that part off as the meat seems edible.	1	0	0	1
Total number of comments:	**10**	**10**	**2**	**22**

APPENDIX E: HARVESTS OF CARIBOU, LOCATION OF HARVEST BY MONTH, NOORVIK, SHUNGNAK, WHITE MOUNTAIN, 2008–2009

Appendix E-1.–Harvests of caribou, location of harvest by month, Noorvik, 2008–2009.

		2008										2009						
Polygon	Sex	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Unknown	Total
23Z 1101	Male	0.0	5.9	5.9	0.0	0.0	52.7	105.4	21.1	9.4	8.2	5.9	16.4	–	–	–	126.4	357.1
	Female	0.0	0.0	0.0	0.0	0.0	0.0	24.6	12.9	0.0	5.9	8.2	1.2	–	–	–	46.8	99.5
	Unknown	0.0	0.0	0.0	0.0	0.0	2.3	16.4	0.0	0.0	0.0	3.5	3.5	–	–	–	46.8	72.6
23Z 1201	Male	0.0	1.2	0.0	0.0	0.0	70.2	112.4	0.0	0.0	0.0	0.0	0.0	–	–	–	4.7	188.5
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	3.5	0.0	0.0	0.0	0.0	0.0	–	–	–	5.9	9.4
23Z 1801	Male	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	2.3
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
23Z 2301	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	–	–	–	5.9	5.9
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
23Z 0501	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
	Unknown	4.7	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	–	–	–	0.0	9.4
23Z 0701	Male	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	7.0	4.7	–	–	–	0.0	12.9
	Female	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	9.4
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2009.

– = No data collected. Noorvik study period was March 2008 through February 2009.

Appendix E-2.–Harvests of caribou, location of harvest by month, Shungnak, 2008–2009.

		2008										2009						
Polygon	Sex	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Unknown	Total
23Z 1101	Male	0.0	0.0	0.0	0.0	0.0	2.4	4.7	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	7.1
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
23Z 1201	Male	0.0	0.0	0.0	0.0	0.0	0.0	18.9	5.9	0.0	0.0	0.0	0.0	–	–	–	4.7	29.5
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	–	–	–	0.0	3.5
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
23Z 2001	Male	0.0	0.0	11.8	0.0	0.0	17.7	21.3	0.0	0.0	9.5	3.5	0.0	–	–	–	46.1	109.9
	Female	5.9	33.1	17.7	0.0	0.0	0.0	4.7	0.0	1.8	14.8	24.2	27.2	–	–	–	15.4	144.8
	Unknown	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	–	–	–	0.0	5.9
23Z 2201	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	1.2	0.0	0.0	–	–	–	0.0	1.2
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
23Z 2301	Male	4.7	3.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0	2.4	4.7	0.0	–	–	–	1.2	20.1
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	9.5	18.9	7.1	–	–	–	0.0	36.6
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	11.8	0.0	0.0	–	–	–	0.0	23.6
23Z 2501	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	8.3	8.3
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	15.4	15.4
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
Missing	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	–	–	–	9.7	9.7

Source ADF&G Division of Subsistence household surveys, 2009.

– = No data collected. Shungnak study period was March 2008 through February 2009.

Appendix E-3.–Harvests of caribou, location of harvest by month, White Mountain, 2008–2009.

		2008										2009						
Polygon	Sex	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Unknown	Total
22B 0202	Male	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	0.0	0.0	7.5
	Female	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22B 0302	Male	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	14.9	7.5	0.0	17.0	42.6
	Female	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	3.2
	Unknown	–	–	–	0.0	0.0	0.0	0.0	0.0	1.1	0.0	5.3	0.0	12.8	5.3	0.0	0.0	24.5
22B 0402	Male	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	1.1	13.9	0.0	0.0	18.1
	Female	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	1.1	0.0	0.0	1.1
23Z 1201	Male	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Missing	Male	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	2.1
	Female	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2009.

– = No data collected. White Mountain study period was June 2008 through May 2009.

APPENDIX F: HARVESTS OF MOOSE BY SEX AND MONTH OF HARVEST, NOORVIK, SHUNGNAK, WHITE MOUNTAIN, 2008–2009

Community	Sex	2008										2009					Unknown	Total
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May		
Noorvik	Male	0.0	0.0	0.0	0.0	0.0	12.9	5.9	0.0	0.0	0.0	2.3	0.0	–	–	–	1.2	22.2
	Female	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	2.3
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
Shungnak	Male	0.0	0.0	0.0	0.0	0.0	0.6	5.7	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	6.3
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	1.2	1.2	0.0	0.0	0.0	0.0	0.0	–	–	–	2.4	4.7
White Mountain	Male	–	–	–	0.0	0.0	0.0	8.5	1.1	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	14.9
	Female	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2009.

– = No data collected. Noorvik and Shungnak study period was March 2008 through February 2009. White Mountain study period was June 2008 through May 2009.

APPENDIX G: HARVESTS OF MOOSE, LOCATION OF HARVEST BY MONTH, NOORVIK, SHUNGNAK, WHITE MOUNTAIN, 2008–2009

Appendix G-1.–Harvests of moose by month and location of harvest, Noorvik, 2008–2009.

		2008										2009						
Polygon	Sex	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Unknown	Total
23Z 1101	Male	0.0	0.0	0.0	0.0	0.0	12.9	5.9	0.0	0.0	0.0	2.3	0.0	–	–	–	1.2	22.2
	Female	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	1.2
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
23Z 1201	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
Missing	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	1.2	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	1.2
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2009.

– = No data collected. Noorvik study period was March 2008 through February 2009.

Appendix G-2.–Harvests of moose by month and location of harvest, Shungnak, 2008–2009.

		2008										2009						
Polygon	Sex	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Unknown	Total
23Z 1201	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	–	–	–	1.2	1.2
23Z 2001	Male	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	4.5
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	0.0
23Z 2301	Male	0.0	0.0	0.0	0.0	0.0	0.6	1.2	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	1.8
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	1.2	1.2	0.0	0.0	0.0	0.0	0.0	–	–	–	0.0	2.4
Missing	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	–	–	–	1.2	1.2

Source ADF&G Division of Subsistence household surveys, 2009.

– = No data collected. Shungnak study period was March 2008 through February 2009.

Appendix G-3.–Harvests of moose by month and location of harvest, White Mountain, 2008–2009.

		2008										2009						
Polygon	Sex	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Unknown	Total
22B 0401	Male	–	–	–	0.0	0.0	0.0	7.5	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	11.7
	Female	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22B 0402	Male	–	–	–	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	2.1
	Female	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22C 0101	Male	–	–	–	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
	Female	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23Z 1201	Male	–	–	–	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2009.

– = White Mountain study period was June 2008 through May 2009.

APPENDIX H: COMPARISON OF 2008–2009 ESTIMATES WITH PREVIOUS SURVEY RESULTS FROM NOORVIK, SHUNGNAK, AND WHITE MOUNTAIN

Community/Resource	Percentage of households harvesting			Total number harvested			Per capita pounds harvested		
Noorvik		2002	2008		2002	2008		2002	2008
Black bear		5%	0%		14	0		1.6	0.0
Brown bear		3%	2%		5	2		0.5	0.3
Caribou		71%	70%		988	767		181.7	173.6
Moose		28%	15%		56	25		41.0	22.0
Muskox		–	0%		–	0		–	0.0
Dall sheep		–	0%		–	0		–	0.0
Shungnak	1998	2002	2008	1998	2002	2008	1998	2002	2008
Black bear	6%	4%	5%	4	2	2	1.5	0.7	0.6
Brown bear	2%	2%	7%	1	1	2	0.4	0.4	0.6
Caribou	72%	67%	68%	561	403	416	311.8	221.2	223.5
Moose	30%	16%	23%	21	11	11	45.6	22.9	23.5
Muskox	–	–	0%	–	–	0	–	–	0.0
Dall sheep	–	–	0%	–	–	0	–	–	0.0
White Mountain	1999	2005[a]	2008	1999	2005[a]	2008	1999	2005[a]	2008
Black bear	–	–	0%	–	–	0	–	–	0.0
Brown bear	0%	0%	2%	0	0	1	–	–	0.0
Caribou	33%	20%	33%	46	50	99	59.9	35.0	69.1
Moose	23%	20%	23%	17	12	15	42.6	33.0	41.2
Muskox	–	5%	10%	–	3	4[b]	–	10.0	13.2
Dall sheep	–	–	0%	–	–	0	–	–	0.0

a. *Sources* Kawerak, Inc., North Pacific Research Board, ADF&G, 2006.

b. Harvest of muskoxen is regulated by permit and is a known quantity. No expansion applied to reported harvest.

– = Data on this species were not collected during this survey period.