Technical Paper No. 402

Wild Food Harvests in 3 Upper Kobuk River Communities: Ambler, Shungnak, and Kobuk, 2012–2013

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

Symbols and Abbreviations

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Weights and measures (metric)	
centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

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

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

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

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

Measures (fisheries)	
fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

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

TECHNICAL PAPER NO. 402

WILD FOOD HARVESTS IN 3 UPPER KOBUK RIVER COMMUNITIES: AMBLER, SHUNGNAK, AND KOBUK, 2012–2013

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ABSTRACT

In February 2013, 53 of 76 households in Ambler, 46 of 69 households in Shungnak, and 30 of 36 households in Kobuk answered questions about their harvest and use of wildlife, fish, and wild plants in 2012. The comprehensive subsistence survey asked respondents about their use, harvest, and sharing of 94 species of fish, land mammals, marine mammals, marine invertebrates, birds, and wild plants and berries. Questions included how much of each resource was harvested, when, and where. The project also collected information on community demographics, income, food security, and wild food networks. Researchers mapped the areas used by community residents for subsistence hunting, fishing and gathering during the 12-month study period.

This project was conducted cooperatively by the Alaska Department of Fish and Game Division of Subsistence and the City of Ambler, the Native Village of Shungnak, and the Native Village of Kobuk. It was funded through reimbursable services agreements with the Alaska Department of Transportation and Public Facilities and the Alaska Industrial Development and Export Authority. The results of the project may be used as a part of the National Environmental Policy Act review of the proposed Ambler Mining District access alternatives.

Weather events during the study period impacted communities' subsistence harvests in late summer and early winter. In July and August 2012, the entire region experienced heavy, prolonged rainfalls that caused flooding and impacted households' abilities to harvest and process wild foods. Delayed and minimal snowfall made travel conditions by snowmachine difficult into January 2013. Total estimated harvests of wild foods for the three villages were 170,468 edible pounds (603 lb per capita) in Ambler, 100,872 lb (368 lb per capita) in Shungnak, and 50,743 lb (309 lb per capita) in Kobuk. Although species were harvested at different rates, the composition of the harvest was strikingly similar across the 3 study communities: they had 7 out of the top 10 most harvested resources in common.

Key words: subsistence fishing, subsistence hunting, Ambler, Kobuk, Shungnak, Ambler Mining District access, whitefishes, caribou, northwest Alaska.

1. INTRODUCTION

Elizabeth Mikow

This report summarizes the results of research conducted on the 2012 subsistence harvests and uses of wild foods by the upper Kobuk River communities of Ambler, Shungnak, and Kobuk. This project provides comprehensive baseline information about contemporary subsistence uses of fish, wildlife, and plant resources, as well as traditional knowledge about these resources. Systematic documentation of harvest, use, and sharing information is important to address long-term information needs regarding the role of these wild resources in Ambler, Shungnak, and Kobuk, and to ensure continued reasonable opportunities for customary and traditional uses of fish and wildlife resources.

These communities are located within the Northwest Arctic Borough, and residents are of predominately Inupiaq descent (Figure 1-1). As in other Alaska Native communities throughout rural Alaska, local residents remain substantially dependent upon wild resources obtained through subsistence hunting, fishing, and gathering. Harvests vary among the 3 study communities, although they depend on a similar resource base. Species harvested by Ambler, Shungnak, and Kobuk include, but are not limited to, salmon, sheefish, Arctic grayling, northern pike, whitefishes, caribou, moose, bears, small game, geese, ducks, wild berries, and greens. Table 1-1 presents a list, including the Linnaean taxonomic names, of resources used by the study communities in 2012.

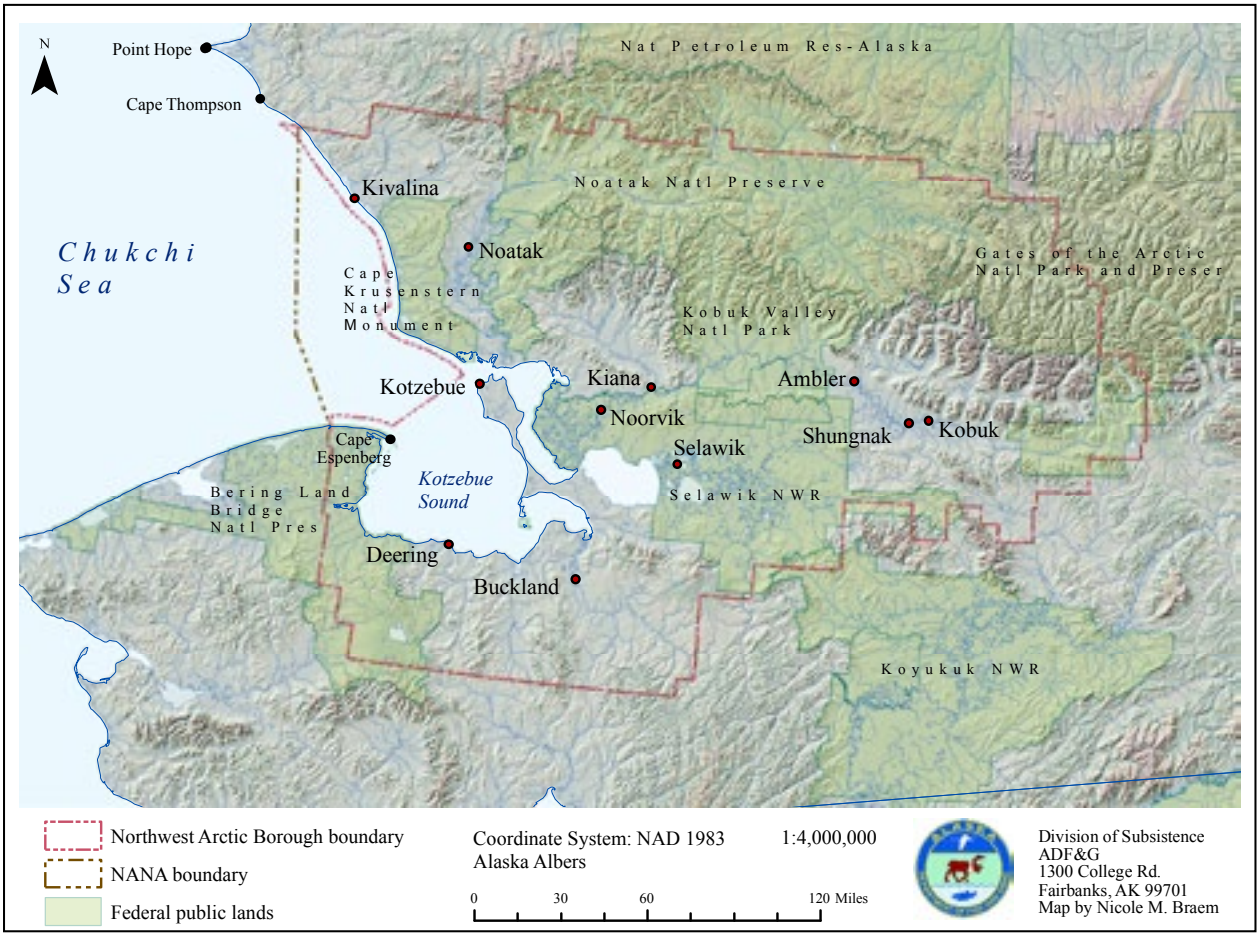

Figure 1-1.–Map of study communities, 2012.

Table 1-1.–List of resources used by the study communities, 2012.

Common name/ name used on survey form	Scientific name	Inupiaq name
Chum salmon	*Oncorhynchus keta*	*Qalugruaq*
Pink salmon	*Oncorhynchus gorbuscha*	*Amaqtuq*
Chinook salmon	*Oncorhynchus tshawytscha*	*Iqalsugruuk*
Sockeye salmon	*Oncorhynchus nerka*	
Coho salmon	*Oncorhynchus kisutch*	
Inconnu (sheefish)	*Stenodus leucicthys*	*Sii*
Broad whitefish	*Coregonus nasus*	*Qausriɬuk*
Humpback whitefish	*Coregonus pidschian*	*Qaalġiq*
Least cisco	*Coregonus sardinella*	*Qalusraaq*
Round whitefish	*Prosopium cylindraceum*	*Quptik*
Bering cisco	*Coregonus laurettae*	*Tipuk*
Northern pike	*Esox lucius*	*Siilik*
Burbot (mudshark)	*Lota lota*	*Tittaaliq*
Dolly Varden (trout)	*Salvelinus malma*	*Qalukpik*
Arctic grayling	*Thymallus arcticus*	*Sulukpaugaq*
Lake trout	*Salvelinus namaycush*	*Kanak*
Rainbow smelt	*Osmerus mordax*	*Iɬlhuaġniq*
Saffron cod (tomcod)	*Eleginus gracilis*	*Uugaq*
Pacific herring	*Clupea pallasi*	*Uqsruqtuuq*
King crab[a]		
Clams[a]		*Iviluq*
Mussels[a]		*Avyak*
Shrimp[a]		
Moose	*Alces alces*	*Tiniikaq*
Caribou	*Rangifer tarandus*	*Tuttu*
Black bear	*Ursus americanus*	*Iyyaġriq*
Brown bear	*Ursus arctos*	*Akɬaq*
Dall sheep	*Ovis dalli*	*Ipnaiq*
Muskox	*Ovibos moschatus*	*Umiŋmaq*
Beaver	*Castor canadensis*	*Paluqtaq*
Muskrat	*Ondatra zibethicus*	*Kigvaluk*
Snowshoe hare	*Lepu americanus*	*Ukalliuraq*
Alaska hare	*Lepus othus*	*Ukallisugruk*
Porcupine	*Erethizon dorsatum*	*Iluqutaq*
Arctic ground (parka) squirrel	*Spermophilus parryii*	*Siksrik*
Marmot[a]		*Siksrikpak*
Wolverine	*Gulo gulo*	*Qapvik, Qavvik*
Gray wolf	*Canis lupus*	*Amaġuq*
Marten	*Martes americana*	*Qapvaitchiaq*
Lynx	*Lynx Canadensis*	*Nuutuiyiq*
Red fox	*Vulpes vulpes*	*Kayuqtuq*
Arctic fox	*Alopex lagopus*	*Qusraaq*
River otter	*Lontra canadensis*	*Pamiuqtuuq*
Mink	*Neovison vison*	*Tiġiaqpak*
Bearded seal	*Erignathus barbatus*	*Ugruk*
Ringed seal	*Phoca hispida*	*Natchiq*

-continued-

Table 1-1.–Page 2 of 2.

Common name/ name used on survey form	Scientific name	Inupiaq name
Spotted seal	*Phoca largha*	*Qasigiaq*
Seal oil		*Usraq*
Beluga whale	*Delphinapterus leucas*	*Sisuaq*
Bowhead whale (or muktuk)	*Balaena mysticetus*	*Aġviq*
Canada goose	*Branta canadensis*	*Iqsraġutilik*
White-fronted goose[a]		*Kigiyuk*
Brant	*Branta bernicla*	*Niġliġnaq, niqliqnaurat*
Emperor goose	*Chen canagica*	*Liġliqpak*
Snow goose	*Chen caerulescens*	*Kaŋuq*
Mallard	*Anas platyrhynchos*	*Ivugasrugruk*
Long-tailed duck (oldsquaw)	*Clangula hyemalis*	*Aahaaliq*
Northern pintail	*Anas acuta*	*Ivugaq, Kurugaq*
Wigeon[a]		*Ugiihiq*
Green-winged teal	*Anas crecca*	*Qaiŋiq*
Northern shoveler	*Anas clypeata*	*Aluutaq*
Scaup[a]		*Qaqɬuktuuq, Qaqɬukpalik*
Bufflehead	*Bucephala albeola*	*Nunuqsiġii ļaq*
Harlequin duck	*Histrionicus histrionticus*	*Saġvam tiŋmiaq*
Goldeneye[a]		
Canvasback	*Aythya valisineria*	
Black scoter	*Melanitta nigra*	*Nayaŋŋaaq*
Surf scoter	*Melanitta perspicillata*	*Tuunġaaġruk*
White-winged scoter	*Melanitta fusca*	*Killalik*
Common eider	*Somateria mollissima*	*Mitiqliqruaq*
Ptarmigan[a]		*Aqargiq, Niqsaaqtuŋiq*
Grouse[a]		*Napaaqtum aqargiq, Urgii ļim*
Sandhill crane	*Grus canadensis*	*Tattirgaq*
Tundra (whistling) swan	*Cygnus columbianus*	*Qugruk*
Salmonberry	*Rubus chamaemorus*	*Aqpik*
Blueberry	*Vaccinium uliginosum*	*Asriavik*
Low-bush cranberry	*Vaccinium vitis-idaea*	*Kikmiññaq*
Crowberry (blackberry)	*Empetrum nigrum*	*Paunġaq*
High-bush cranberry	*Viburnum edule*	*Uqpiŋñaq*
Willow leaves	*Salix pulchra*	*Sura*
Sourdock	*Rumex arcticus*	*Quaġaq*
Stinkweed	*Artemisia tilesii*	*Sargiq, Sargiġruaq*
Hudson's Bay (Eskimo; Labrador) tea	*Ledum groenlandicum*	*Tilaaqqiuq*
Eskimo potato	*Hedysarum alpinum*	*Masru*
Sea lovage	*Ligusticum scoticum*	*Tukkaayuk*
Beach greens	*Honckenya peploides*	*Atchaaqɬuq*

Sources Georgette and Shiedt 2005; Anderson et al 1977; Jones 2010.

a. In some cases, the survey did not ask for specific species, but used a broader category (e.g., crab, wigeon). Some species may be inferred by what was commonly available locally.

The upper Kobuk River lies within the core range, or migratory range, of the Western Arctic caribou herd (WAH). Caribou pass through sections of the Kobuk River valley twice yearly during spring and fall migrations. Small groups of caribou may overwinter within reach of local hunters accessing the country by snowmachine. Accordingly, caribou figure prominently in any discussion of local subsistence patterns. This herd, the largest in Alaska, ranges across an area of 140,000 square miles. At its peak in 2003, its estimated population numbered 490,000 animals. It declined annually at a rate of 4–6% through 2011. In the most recent census completed in July 2013, the herd had declined to 235,000 animals, a 27% decline in 2 years. Alaska Department of Fish and Game (ADF&G) biologists believe that mortality was especially high in winter 2011–2012 due to deep snow and high numbers of predators in overwintering areas[1] (Jim Dau, Wildlife Biologist, ADF&G Kotzebue, personal communication, May 16, 2014).

Although the 3 study communities draw from a similar resource base due to their shared geography and cultural backgrounds, they vary in harvest levels and demographic characteristics. Based on the results of the survey effort, Ambler had a population of 283 people in 2012, Shungnak had a population of 275, and Kobuk had a population of 164 individuals. In all 3 study communities, 87% or more of the population was Alaska Native. Population estimates based on the data gathered in this survey effort differed slightly from those provided by the Alaska Department of Labor; according to their data, Ambler's July 2012 estimated population was 270, Shungnak had a population of 269, and Kobuk's population was 141.[2] These differences can be explained by a number of factors including survey timing, definitions of residency, and sampling strategies (Table 1-2).

Weather in 2012 had a major impact on subsistence fisheries across western Alaska, including the 2013 study communities. Extremely heavy rainfall occurred throughout July and August. Three significant low pressure systems affected northwest Alaska in August, with rainfalls 200–400% above normal.[3]

Parts of the region experienced a once-in-100-year rainfall, defined as 3 in of rain in a single day. At the Red Dog mine northeast of Kotzebue, 15.31 in of rain fell during August, which was well over half the average precipitation accumulation for an entire year (Angeloff et al. 2013). In all study communities, survey and key respondents remarked upon the unusually lengthy period of rain and the ways in which rain and high water affected the harvest and processing of fish.

Project Background

This project was conducted cooperatively by the ADF&G Division of Subsistence and the City of Ambler, the Native Village of Shungnak, and the Native Village of Kobuk. This study was funded through reimbursable services agreements with the Alaska Department of Transportation and Public Facilities and the Alaska Industrial Development Export Authority. The results may be used as a part of the National Environmental Policy Act review of the proposed Ambler Mining District access alternatives.

The study communities are located within the Ambler Mining District, which contains a 75-mile-long mineral belt bearing several significant and lesser deposits of copper, zinc, gold, and silver. The State of Alaska is evaluating the potential for construction of a 200-mile road that would connect the area to the Dalton Highway—and thereby, the statewide road system. The road would facilitate the development of mines of known deposits and additional exploration. It would also link a very remote region of Alaska to urban centers, offering long-term benefits and costs to local residents. Of particular concern are the impacts

1. Alaska Department of Fish and Game Division of Wildlife Conservation. "Western Arctic caribou herd numbers 235,000 animals in recent survey," news release, May 12, 2014.
http://www.adfg.alaska.gov/static/applications/webintra/wcnews/2014/releases/05-12-2014.pdf
2. Alaska Department of Labor and Workforce Development (ADWLD), Juneau n.d. "Research and Analysis Homepage: Places and Other Areas: Cities and Census Designated Places (CDPs), 2010-2013 (Excel)." Accessed January 2014.
http://laborstats.alaska.gov/pop/poptest.htm
3. The Alaska Climate Research Center, Fairbanks. 2012. "August 2012 Synoptic Summary." Accessed September 24, 2013.
http://climate.gi.alaska.edu/Summary/Synoptic/2012/Aug

Table 1-2.–Demographic and sample characteristics for Ambler Mining District communities, 2012.

Characteristics	Community		
	Ambler	Kobuk	Shungnak
Sample achievement			
Sampled households	53	30	46
Eligible households	76	36	69
Percentage sampled	69.7%	83.3%	66.7%
Sampled population	197	137	183
Estimated population	282.5	164.4	274.5
Household size			
Mean	3.7	4.6	4.0
Minimum	1	1	1
Maximum	11	11	9
Age			
Mean	31.8	25.4	28.4
Minimum	0	0	0
Maximum	91	96	86
Median	26	20	24
Sex			
Estimated male			
Number	137.7	85.2	139.5
Percentage	48.7%	51.8%	50.8%
Estimated female			
Number	144.8	79.2	135.0
Percentage	51.3%	48.2%	49.2%
Length of residency			
Population			
Average	24.4	18.8	23.4
Minimum	0	0	0
Maximum	91	96	86
Household heads			
Average	38.2	32.5	38.5
Minimum	0	0	0
Maximum	91	96	86
Alaska Native			
Estimated households			
Number	60.2	25.2	54.0
Percentage	79.2%	70.0%	78.3%
Estimated population			
Number	245.2	142.8	250.5
Percentage	86.8%	86.9%	91.3%

Source ADF&G Division of Subsistence household surveys, 2013.

of infrastructure and development on the customary and traditional way of life of local residents as well as on the subsistence resources upon which they depend.

The goal of this study was to gather comprehensive baseline information about contemporary subsistence patterns of use in 3 communities situated along the Kobuk River in northwestern Alaska. Comprehensive subsistence harvest surveys had never been conducted in Kobuk or Ambler. Baseline information had been collected for Shungnak in 2002, but these data are now a decade old (Magdanz et al. 2004). Noorvik was not included in this survey effort, because baseline data were collected in that community in 2013 as a part of a separate project, the Chukchi Sea and Norton Sound Community Observation Network project, funded through the Coastal Impact Assistance Program. Kiana, also located on the Kobuk River downstream of the proposed resource development area and access alternatives, was not included in this project because a comprehensive subsistence harvest study was conducted in the community in 2007 (Magdanz et al. 2011). Selawik was also not included in this project because comprehensive baseline harvest information was collected there in 2011(Braem et al. 2013).

Regional Background

Ambler, Shungnak, and Kobuk are located in the upper Kobuk River valley and lie within 32 miles of each other along the mainstem of the Kobuk River. The upper Kobuk River district (as defined by Burch Jr. [1998]) contains the entirety of the Kobuk River drainage from the mouth of the Ambler River upstream, encompassing an area of approximately 6,500 square miles; this region includes the Schwatka Mountains, the Cosmos Hills, the Ambler Lowland, and the Mauneluk, Pah, Selby, Beaver, and Reed rivers. Taken as a whole, the upper Kobuk district has the most varied landscape of any region in northwest Alaska (Burch Jr. 1998:126–128). This area was largely the territory of the Kuuvaum Kaŋiaġmiut[4], a society that occupied the upper Kobuk River valley in the late 19th century and from which a majority of the contemporary residents of Ambler, Shungnak, and Kobuk are descended.

Prehistory

James Louis Giddings Jr. was the first archaeologist to focus upon the prehistory of the Kobuk River valley. His work, combined with extensive excavations in the 1960s at the Onion Portage site, led to the prehistory of the region being better known than almost any other in Alaska. Onion Portage is 1 of the most important archaeological sites in the North American Arctic, containing more than 70 individual cultural layers over the span of 10,000 years. The predecessors of the Kuuvaum Kaŋiaġmiut inhabited a very different landscape than the boreal forest of the contemporary region. Ancient inhabitants hunted caribou and other modern Arctic resources, as well as possibly horses and bison, on the prehistoric steppe. The landscape of the Kobuk River valley changed greatly over the millennia as dwarf birch trees, willows, and alders became resident, and eventually spruce trees took hold in the valley. Changes to the landscape prompted changing use patterns for the earliest Kobuk River residents, who likely had traded with neighboring groups (particularly those living on the Koyukuk River) for wood prior to this resource becoming established in the region. The first inhabitants of the valley also had trading relationships with residents of the Brooks Range for chert in order to construct stone tools, and later with neighbors in the Koyukuk River drainage for obsidian. Hearth sites dating to 6500–6000 BC indicate that Kobuk River people relied primarily on caribou, and there was no evidence that they engaged in fishing. Around 6000 BC, Onion Portage was abandoned for a span of about 2,000 years, possibly due to channel changes on the Kobuk River or changes to subsistence resource availability (Anderson et al. 1977:11–19).

From 4000 BC to AD 1000, different groups occupied the Kobuk River valley more generally, and Onion Portage more specifically. Based on tool assemblages at the site, the first people to reoccupy the region were likely Indian groups from Interior Alaska and the southwest Yukon River area; evidence of notched

4. The location of modern-day Ambler would have been within the territory of the Akuniġmiut, a group occupying the central Kobuk River valley.

stones dating to 2500 BC used for gillnets indicates that these residents harvested fish. Around 2200 BC, the Denbigh Eskimos, who may be the ancestors of all Inupiaq groups, began to occupy the valley. This group resided along coastal regions of Western Alaska, moving seasonally between the Interior and the coast in pursuit of marine and terrestrial resources. In the timeframe between 1600 and 600 BC, evidence suggests that this group became more regionally specialized in their subsistence pursuits, which increased regional cultural diversity within the region. Easy access to game would have allowed residents of the Kobuk River valley to hunt and fish locally, and trading connections to relatives on the coast allowed them access to coastal resources. These Kobuk River groups occupied the valley until sometime between AD 500 and 600, when caribou declines prompted them to move in order to target marine resources. In the absence of the Denbigh Eskimos, other groups occupied the valley, likely the ancestors of the present-day Koyukon Athabascans (Anderson et al. 1977:19–22).

Around AD 1000, Inupiat from coastal regions once again resettled the Kobuk River valley year-round, and these people were likely the Kuuvaŋmiit.[5] An abundance of caribou, new fishing technology, and a steady supply of marine mammal resources through trade led to population growth. Archaeological remains indicate that settlements were constructed for various purposes, including those used for winter caribou hunting, spring seal hunting, and salmon fishing in the summer. Subsistence pursuits and the resource bases that support them seem to have remained fairly consistent from the 15th to the 18th centuries. When caribou populations began to decline again in the late 19th century, some Kuuvaŋmiit chose to pursue coastal resources, while residents of the upper river were able to remain in the Interior due to greater access to foreign trade goods (Anderson et al. 1977:23–26).

The Ethnographic Past

While the Kuuvaŋmiit were in residence throughout a large portion of the Kobuk River valley during the 18th and 19th centuries, the cultural affiliation of upper Kobuk River residents may have been more fluid during this timeframe. Contact between Koyukon Athabascans living along the Koyukuk River and upper Kobuk residents was common in the 19th century, and this contact was likely a continuation of a relationship between the 2 groups that began centuries before (Burch Jr. 1998). The differentiation of material culture between the groups is difficult, leading Giddings Jr. to describe both Inupiaq and Koyukon cultural remnants as "Arctic Woodland Culture."

By the late 19th century, people living on the upper Kobuk River were the Kuuvaum Kaŋiaġmiut and their first language was Inupiaq; interestingly, George M. Stoney, the first Western explorer to spend significant documented time on the upper Kobuk River (1885–1886), indicated that residents of the area principally spoke Koyukon a mere generation before (Burch Jr. 1998). Others, notably Giddings Jr., rejected the idea that upper Kobuk River residents had been Koyukon in the early 19th century based on the information given by an informant born in the 1860s (Burch Jr. et al. 1999). In 1989, an unpublished 1931 report was uncovered in which Charley Wood, an Inupiaq elder, stated that "upper Kobuk natives were Indians" when he was a boy (Burch Jr. et al. 1999:295)[6]. Other sources taken from elder respondents seem to corroborate this idea (Burch Jr. et al. 1999). The precipitating factor for this transformation appears to have been the movement of a majority of Koyukon Athabascans further upstream and inland, which left the upper Kobuk River Natives who chose to remain in the region isolated and surrounded on 3 sides by Inupiaq groups. Because of ongoing relations between the 2 groups and widespread bilingualism on both sides, assimilation of Koyukon Athabascan residents of the upper Kobuk River was a peaceful process brought about by trading and intermarriage (Burch Jr. et al. 1999:307–308). This ethnogenesis theory was not widely accepted among

5. Kuuvaŋmiit refers to "Kobuk River people" more generally, and there are 3 nations under this designation—the Kuuŋmiut of the Kobuk delta, the Akuniġmiut of the central Kobuk valley, and the Kuuvaum Kaŋiaġmiut of the upper Kobuk valley (Burch Jr. 1998:123).

6. This report was uncovered by Burch in 1989; it is an unpublished manuscript written in 1931 by a teacher in Selawik. It was a summary of interviews conducted with two elders. Charley Wood was widely acknowledged as the oldest person from the Kobuk River valley alive at the time.

Charles Crabaugh papers, UAF-2010-107-78, Archives, University of Alaska Fairbanks

Plate 1-1.–1949 Summer camp on the Kobuk River at Shungnak, AK.

contemporary upper Kobuk River residents, many of whom held the conventional view that Koyukon Athabascans living in the region were displaced by Inupiaq groups (Magdanz et al. 2004).

Regardless of the question of cultural transformation in the early part of the century, by the late 19th century the residents of the upper Kobuk River were Kuuvaum Kaŋiaġmiut. Contact with Euro-American explorers, traders, and miners began during this timeframe, with the first written accounts of the region occurring in 1884 and 1885 (Burch Jr. 1998). John C. Cantwell and George M. Stoney of the Revenue-Marine Service undertook separate expeditions on the Kobuk, and Stoney overwintered near the location of present-day Shungnak. His winter camp, named Fort Cosmos, provided a base for expeditions in all directions; his men ranged as far as the Noatak River valley, Point Barrow, and the Yukon River (Brown 2007rep.:46–47). Native residents of the upper Kobuk River were of great help to the expedition, and many were employed to procure food, help with camp construction, ferry materials, and gather wood for heat. Stoney also traded with Native residents for traditional clothing, having understood the value of these items in protecting his men against the elements. Stoney's observations document Interior Inupiaq life at a time of great social upheaval stemming from declining caribou numbers, the influx of outside trade goods, and diseases introduced by outsiders (Brown 2007rep.:49). Indeed, a famine of disastrous proportions was described by a Kobuk River elder, who stated "all the Kobuk people starved that year [1881]" (Burch Jr. 2012:84).The Marine-Revenue Service expeditions brought back evidence of precious metals, which attracted prospectors into the region at the turn of the century (Brown 2007rep.:56).

Historical Seasonal Round

While many aspects of the seasonal cycle of Kuuvaum Kaŋiaġmiut subsistence activities were similar to those in the present day, earlier subsistence patterns were marked by a greater level of household mobility. Burch Jr. (1998) and Anderson et al. (1977) together offer a picture of upper Kobuk River subsistence pursuits in the 1880s collected from a number of historical sources (Burch Jr. 1998; Cantwell 1887, 1889; Giddings Jr. 1952, 1961; Magdanz et al. 2004; Townsend 1887).

Springtime was the season for travel, and upper Kobuk River residents dispersed from their winter settlements to their spring camps. The placement of these camps varied, but they were generally located away from the main river because there were relatively few fish in the Kobuk River during the months prior to breakup (Burch Jr. 1998:138). Ideal locations for spring camps included places near caches of food from the previous fall, near lakes where fish could be harvested through the ice, in willow stands ideal for harvesting ptarmigan and snowshoe hares, and in areas where small populations of caribou could be found (Anderson et al. 1977:130). Camps were often small, consisting of 1 to 3 households living in tents, and families tended to camp in the same locations year after year (Burch Jr. 1998:138). As the season progressed, different resources were targeted. Men would hunt muskrats, beavers, and migratory waterfowl, and they would sometimes take bears in their dens. Women would often spend their time fishing and drying the catch, as well as making and repairing seines to be used for summer fishing (Anderson et al. 1977:130; Burch Jr. 1998:138).

Following breakup, extended family groups related through the female line would travel to their summer camps (Plate 1-1). Because most upper Kobuk people did not have large boats, they generally constructed rafts to float downriver to their camps. Camp sites were often located near gravel bars that allowed for ideal seining conditions (Burch Jr. 1998:139). The camps were generally established by early June, at which time men would join together in small groups to travel northward to the Brooks Range to hunt. During these forays, hunters would target Dall sheep, caribou, marmots, and sometimes bears. The primary aim was collecting skins and other animal products, and they generally consumed the meat in the mountains (Anderson et al. 1977:131). Hunting would continue throughout the summer. While the men hunted, women, children, and elderly men would fish for successive runs of fish species. They would seine for whitefishes and later for salmon, then dry the catch and roe on racks erected along the beach. During this time, camp residents would also gather berries and greens (Burch Jr. 1998:139–140). A few families would spend the summer away from the region, traveling in groups to Sheshalik (Sisualiq), near Kotzebue, for the trade fair and beluga whale hunting along the coast. As they traveled downriver, these groups would acquire fur and other trade goods to sell at the fair. On the return trips, they would fish as they traveled (Burch Jr. 1998:143).

In late August and early September, the men would come back from their hunting forays in the mountains and raft downriver with their catch to their families' fish camps. Groups would remain at their summer camps, fishing and harvesting migratory waterfowl (Anderson et al. 1977:132). As the days became colder, men would begin to transport the harvest and other supplies to a location upstream where they would make their early fall camps near good caribou crossings. Their families would join them some time later. At the fall camps, hunters would attempt to drive bands of caribou towards fences to force their river crossing in a particular location where other hunters would wait to spear them as they swam (Burch Jr. 1998:144). Fences were a series of cairns, made out of stone, shrubs, or logs, in the shape of a V. The open end pointed in the direction from which the caribou were expected to arrive. Once the caribou entered the fence, people would shout and chase them further into the trap towards the waiting hunters (Burch Jr. 2012:40). The catch was butchered immediately and the meat preserved by either drying or freezing (Anderson et al. 1977:133). Just prior to freeze-up, all upper Kobuk River residents moved back downstream along the main river to their winter settlements. Because of a traditional prohibition against living in the same house for more than 1 winter, villages were rebuilt each fall (Burch Jr. 1998:145). Immediately after the river froze, residents began to place fish traps under the ice. These traps were used to catch sheefish, burbot, whitefishes, and northern pike (Anderson et al. 1977:134).

In the winter, subsistence activities slowed for residents of the upper Kobuk River valley. Winter was also the time of the main holiday season. When supplies and weather conditions allowed, messenger feasts were held with neighboring villages (Burch Jr. 1998:146). Some hook and line fishing through the ice occurred until the fish stopped biting in midwinter. Hunters harvested caribou and furbearing animals when available for food and hides. With the lull in subsistence harvest activities, people also occupied themselves making and repairing equipment in advance of the spring season (Anderson et al. 1977:134).

Recent History

Following the gold rush to the Klondike, prospectors began to move into Alaska along the Yukon River. The competition for productive mining led some miners to look for new alternatives, which included mining the Koyukuk and the Kobuk river valleys (Brown 2007rep.:66). This led to a short-lived gold rush to the Kobuk River valley in 1898–1899, which brought hundreds of gold prospectors into the area (Brown 1988:199). Shungnak was originally settled in 1899 by these miners, who chose to use the site as a supply point for mining activities in the Cosmos Hills (Stirling 1985:3). Originally located at the site of present-day Kobuk, Shungnak became the location of a trading post, a Friends church mission, and a school. Roberts' (1978) history of the Friends Church provides some detail from this timeframe from missionary accounts. These amenities, coupled with employment opportunities, served as a draw for Native inhabitants of the region to settle in this community. Euro-American settlers in the region understood the importance of Native knowledge in travel and hunting, and economic activity in the upper Kobuk River valley was not segregated or dominated by outsiders (Brown 1988:211–212). After the spring of 1898, most of the prospectors in the region moved on. Only 10 miners remained in the area as of 1910 (Stirling 1985:6).

Reindeer had first been introduced to Alaska in 1892 on the Seward Peninsula in order to provide a source of food for Native residents; this was prompted by declining caribou populations in northwest Alaska and the decimation of marine mammal populations by the activity of commercial whalers in the region (Burch Jr. 2012:113). Reindeer herding spread from the Nome region throughout northwest Alaska, and a herd was established in Shungnak in 1907, which persisted until the early 1940s (Brown 2007rep.:112). Although reindeer herds across northwest Alaska grew in size and number until the 1930s, the situation reversed in that decade. Caribou returned in substantial numbers to the Kobuk River valley in the late 1940s as reindeer populations declined (Burch Jr. 1998:44,134).

Around 1927, flooding and erosion at the Shungnak village site prompted a majority of residents to relocate 10 miles downstream to the contemporary location of the community (Magdanz et al. 2004:2) This new settlement was first called "Kochuk," but residents later adopted the original name Shungnak. The few families that chose to remain at the original site of the community and those who later moved back renamed the site Kobuk (Orth 1971rep.:534). Although published census records after 1900 only listed Kobuk and Shungnak, other communities further upstream were in existence after the turn of the century. The village of Qalla was populated until at least 1920, and Pah, near the confluence of the Pah River, persisted until at least 1930. As time progressed, populations from these upriver communities began to shift to the Shungnak–Kobuk area.[7]

During the time frame between World War I and II, the upper Kobuk River region experienced a low level of economic productivity, with limited but consistent sources of cash employment from fur trapping and mining. The Native population had steadily increased following World War I, and basic access to trade, health services, and schooling was available as a result of commercial, government, and missionary activity (Brown 1988:392–393). As a result of the short-lived mining boom on the upper Kobuk River, a rudimentary travel and supply system was in place in the region by about 1930. Beginning in the 1920s, significant territorial and local funding supported the creation of airfields throughout Alaska, including in Shungnak (Brown 2007rep.:113). The Alaska Road Commission also constructed the Kiana–Selawik–Shungnak trail for mail service in 1932 (Stirling 1985:7). After the short-lived mining boom in the region ended, wage employment was hard to come by for Kobuk River residents. Fur trapping provided a source of cash income, which continued even after the crash of fur prices in the 1930s (Brown 2007rep.:117). Archaeologist James Louis Giddings Jr. conducted the first formal ethnographic research in the upper Kobuk River region in the 1940s, continuing his work in the area until the 1960s (Magdanz et al. 2004:4). Observations from his research indicate that residents of the region returned to a greater reliance on fishing and hunting as the economy stagnated. The relative abundance and diversity of resources along the upper

7. James S. Magdanz, editor, *A history of human–land relationships on the upper Kobuk River*, Alaska Department of Fish and Game Division of Subsistence, unpublished data, page 18, 2007. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

Kobuk River and adjacent drainages allowed residents to adapt to difficult circumstances, employing the flexibility and mobility that has ensured their survival for centuries (Brown 2007rep.:117).

Following World War II, upper Kobuk River residents experienced continuing political and economic changes. In 1947, William Zimmerman, the Acting Commissioner of Indian Affairs, proposed to create 640-acre reservations at village sites in order to protect the subsistence way of life of Native Alaskans. Among the proposed reservations was a 2,300-square mile reservation for Shungnak and Kobuk. This proposal never advanced, and in 1948, Dillon Seymour Myer was appointed Commissioner of Indian Affairs. Myer opposed the creation of new reservations because they had the potential to delay the assimilation of Native Americans (Mitchell 1997:302). In 1950, he put the proposed reservations to a vote among the local population. Residents in Shungnak and Kobuk, concerned about repeating the negative experience of Indians in the contiguous U.S., voted against the reservation by a large margin (Mitchell 1997:304).

In 1958, some residents from Shungnak and Kobuk moved downstream because of the rich resource base of the area and settled Ambler.[8] In the 1960s, Kennecott Mining opened a deep shaft to extract copper ore at Bornite, about 10 miles north of Kobuk. This shaft flooded before it went into full production and was subsequently abandoned.[9]

In the years following the passage of the Alaska Native Claims Settlement Act (ANCSA) in 1971, upper Kobuk River residents became minority land owners in their home region. The federal government held ownership of about 50% of the land, the State of Alaska owned a further 40%, and NANA Regional Corporation, Inc. (a regional ANCSA for-profit corporation) owned 10%. Individuals owned less than 1% of the region's lands, mostly as Native allotments.[10] Further discussion of patterns of settlement and land use in the early 20th century can be found in the unpublished manuscript *A History of Human–Land Relationships on the upper Kobuk River*.[11] Contemporary life on the upper Kobuk has also been described by former Ambler school teacher, Nick Jans (1993) as well as in collections of oral history from elders gathered by the Northwest Arctic Borough School District (Magdanz et al. 2004).

Contemporary Setting

Ambler, Shungnak, and Kobuk lie within the overlapping boundaries of several political bodies: the Northwest Arctic Borough, NANA Regional Corporation, Inc. (NANA), and state Game Management Unit (GMU) 23. The Northwest Arctic Borough includes all lands and waters that drain into the Chukchi Sea between Cape Espenberg and Point Hope—approximately 38,600 square miles. A total of 11 communities[12] are located within the borough, the largest of which is the regional center of Kotzebue, which had an estimated population of 3,237 in 2012[13] (Figure 1-2). For the 10 remaining communities, populations range from 141 in Kobuk to 856 in Selawik. The total 2012 population of the borough was 7,601 people, 81%[14] of

8. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed January 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

9. James S. Magdanz, editor, *A history of human–land relationships on the upper Kobuk River*, Alaska Department of Fish and Game Division of Subsistence, unpublished data, 2007. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

10. James S. Magdanz, editor, *A history of human–land relationships on the upper Kobuk River*, Alaska Department of Fish and Game Division of Subsistence, unpublished data, page 19, 2007. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

11. James S. Magdanz, editor, *A history of human–land relationships on the upper Kobuk River*, Alaska Department of Fish and Game Division of Subsistence, unpublished data, 2007. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

12. These communities include all cities and census designated places in the Northwest Arctic Borough, excluding the Red Dog mine census designated place. Although there are group quarters in this location, there are no permanent residents.

13. Alaska Department of Labor and Workforce Development (ADWLD), Juneau n.d. "Research and Analysis Homepage: Places and Other Areas: Cities and Census Designated Places (CDPs), 2010-2013 (Excel)." Accessed January 2014. http://laborstats.alaska.gov/pop/poptest.htm

14. U.S. Census Bureau American Community Survey, Washington, D.C., n.d. Information for "Northwest Arctic Borough,

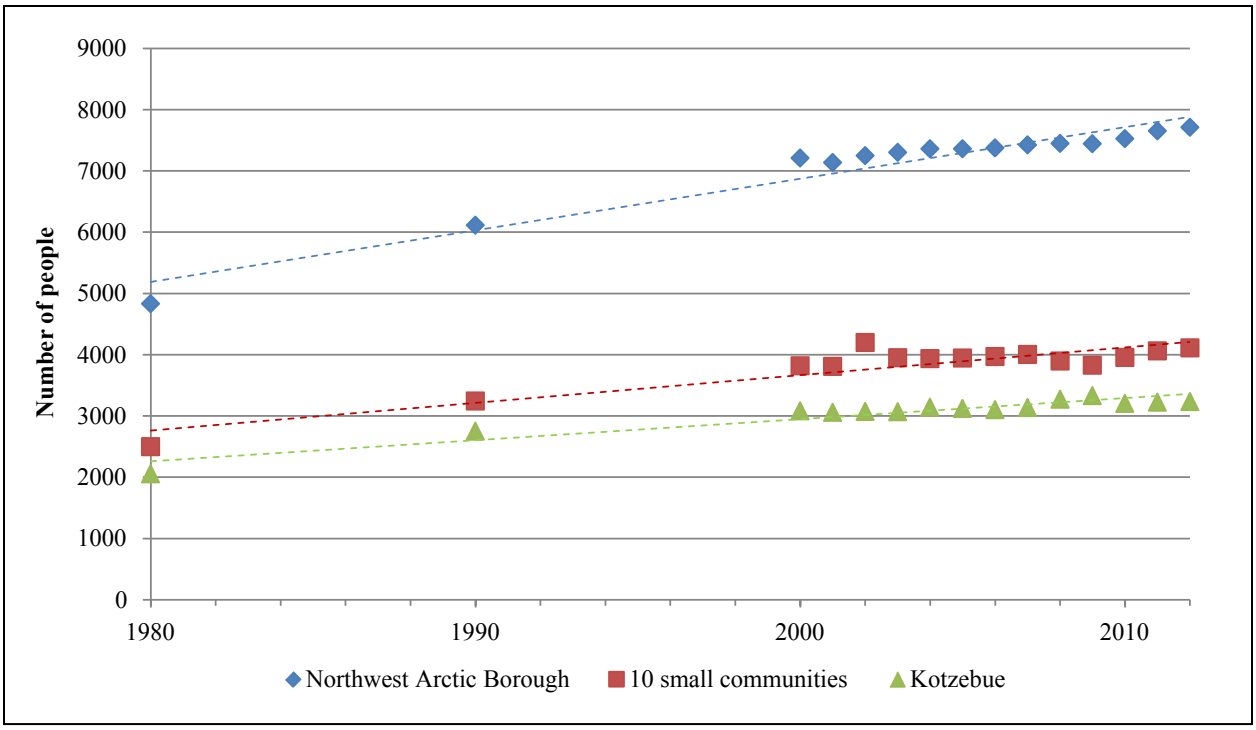

Figure 1-2.–Historical population estimates, Northwest Arctic Borough, 10 small communities within Northwest Arctic Borough, and Kotzebue, 1980–2012.

whom were Alaska Native (predominately Inupiaq). Kotzebue serves as a hub for transportation, services, and supplies in the region and receives daily jet service from Anchorage. Kotzebue does not have a natural harbor; instead, deep draft vessels must anchor 15 miles offshore, and cargo must be ferried to the docking facility.[15] A number of local airlines transport passengers and freight to the outlying communities on a daily basis. Travel to and from the smaller communities is also undertaken by snowmachine and boat seasonally.

The largest employers in the region are Red Dog mine, Maniilaq Association (an ANCSA nonprofit regional corporation), the Northwest Arctic Borough School District, and Kikiktagruk Inupiat Corporation. Per the U.S. Census Bureau American Community Survey, for the 5-year period 2008–2012, the local unemployment rate was 17%; of the 5,203 individuals aged 16 and older, there were 906 individuals who were in the labor force that were unemployed. Government workers were the largest class of workers, with 37% of the working population employed by governmental entities. By industry, the largest employers of borough residents were education and health services (30%); agriculture, forestry, fishing and hunting, and mining (13%); and transportation (11%).[16]

Maniilaq Association operates health clinics that provide basic health services to all 3 study communities. Serious medical emergencies require evacuation (medevac) to Maniilaq's main medical facility in Kotzebue or hospitals in Anchorage. All 3 communities have schools operated by the Northwest Arctic Borough School District. Most homes in Ambler and Shungnak are connected to a water and sewer system, and more than half of the population of Kobuk has these amenities. All 3 communities are accessible by daily air

Alaska" retrieved via U.S. Census Bureau American FactFinder. Accessed January 2014. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

15. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed January 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

16. U.S. Census Bureau American Community Survey, Washington, D.C., n.d. Information for "Northwest Arctic Borough, Alaska" retrieved via U.S. Census Bureau American FactFinder. Accessed January 2014. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

service originating in Kotzebue, by boat, and by snowmachine. Barges can reach all 3 communities if river conditions permit, and barge travel is usually attempted soon after breakup when water levels are highest. In 2013, a Kotzebue-based barge service was able to reach Ambler twice, but not Shungnak or Kobuk. Several trails are used for intervillage travel, and there is a 7-mile unmaintained road connecting Shungnak and Kobuk.

Regulatory context

Alaska is unique in the nation in having both state and federal laws that make customary and traditional subsistence hunting and fishing a priority over other consumptive uses, such as commercial fishing. Aboriginal hunting and fishing rights were extinguished by ANCSA in 1971, but the lack of legal protection of Alaska's subsistence way of life was noted by the Alaska State Legislature and U.S. Congress. Concerned over competing commercial and recreational uses, both bodies subsequently adopted laws intended to protect opportunities for customary and traditional uses of fish and wildlife in the state.

In 1978, the Alaska State Legislature adopted priorities for subsistence uses of fish and game over other consumptive uses, including a subsistence fishing priority under AS 16.05.251(b) and a subsistence hunting priority under AS 16.05.255(b). In 1980, the U.S. Congress adopted a similar subsistence priority in the Alaska National Interest Lands Conservation Act (ANILCA). In 1986, the Alaska Legislature adopted a statute establishing a rural subsistence priority consistent with that of ANILCA so that the state could manage all subsistence uses on state and federal land. In 1989, the state statute establishing a rural subsistence priority was ruled unconstitutional in *McDowell v. State of Alaska.*[17] In 1992, the Alaska Legislature adopted the current subsistence statute, AS 16.05.258. The Alaska Board of Fisheries (BOF) and the Alaska Board of Game (BOG) adopt and revise state subsistence regulations throughout Alaska. Fishing and hunting statutes and regulations have been further refined by subsequent court rulings. After the rural priority statute was ruled unconstitutional, the federal government began managing subsistence uses by rural residents on federal public lands and waters. Federal subsistence regulations are promulgated by the Federal Subsistence Board, although certain subjects must be addressed by regulations of the Secretaries of Interior and Agriculture.

The practical consequence of this arrangement is that subsistence users must often consult both state and federal regulations for the lands on which they are hunting and fishing. This can become confusing, even for agency personnel. State regulations generally apply on most lands, and exclusively on state and private lands, which include ANCSA corporation lands.[18] Federal subsistence regulations apply to federally qualified subsistence users on federal public lands.[19] On most federal public lands, all Alaska residents may hunt and fish under state regulations and bag limits, unless the lands have been closed by federal regulation. In certain national parks and monuments, hunting and fishing may be restricted to certain federally qualified subsistence users.

In many cases, state and federal regulations are identical; however, there are times in which they differ. One important example of this difference can be found in northwest Alaska. Under state regulations, the caribou bag limit for a resident hunting north of the Yukon River is 5 per day. On the Noatak National Preserve, any Alaska resident hunting north of the Yukon River may hunt under state regulations, observing the 5 caribou daily bag limit. However, a federally qualified subsistence user may hunt under federal subsistence regulations, which allow hunters 15 caribou per day.

In the vicinity of the three study communities, federally managed lands include Cape Krusenstern National Monument, Selawik National Wildlife Refuge, Kobuk Valley National Park, Noatak National Preserve, and Gates of the Arctic National Park and Preserve. Subsistence activities in national parks are further limited

17. McDowell v. State of Alaska. 785 P. 2d 1 (Alaska 1989).
18. However, ANCSA corporations and individual allotment owners may limit access to Native-owned lands, as could any other landowner. NANA, Inc. has placed restrictions on access to its lands for hunting, fishing, and trapping by nonshareholders.
19. Federal qualifications include being a rural Alaska resident living in a community determined to have customary and traditional use of a fish stock or game population.

to resident zone communities specified in ANILCA. Ambler, Kobuk, and Shungnak are named as resident zone communities for both Gates of the Arctic National Park and Preserve and Kobuk Valley National Park.

Under both state and federal hunting regulations, hunters may harvest caribou from a boat moving under power and may take swimming caribou with a firearm using rimfire cartridges. These exceptions to general hunting regulations reflect the customary and traditional caribou hunting practices of the residents of Unit 23.

State management of subsistence fishing on the upper Kobuk River is by and large minimal—there are no closed seasons, no bag limits, no required license or permit, no reporting requirement, no harvest monitoring program, and few gear restrictions. One point of contention for upper Kobuk River residents (as with other residents of the region) is that state regulations do not consider rod and reel to be a subsistence gear in this area, except when fishing through the ice (5 AAC 01.122). Thus, persons wishing to fish with rod and reel gear in open water are expected to purchase a state sport fishing license and observe bag limits in sport fishing regulations. A proposal to the BOF to include rod and reel as a legal subsistence gear failed in January 2010. Subsistence fishers in the region regularly use rod and reel in times of open water as a method for catching sheefish—often in large quantities. Sport fishing bag limits for sheefish are 10 per day downstream of the mouth of the Mauneluk River and 2 per day upstream.

Under the Marine Mammal Protection Act of 1972, "coastal Alaska Natives" were granted an exemption from the law's prohibition of hunting marine mammals that allows them to continue to hunt for marine mammals for subsistence. Although the law does not directly affect upper Kobuk River residents, it does allow continued access to marine mammal products through traditional sharing, bartering, and trading relationships with coastal communities.

The Migratory Bird Treaty Act of 1918 prohibits the take of migratory birds or their eggs, except as allowed by federal regulation. In 2003, the U.S. Department of the Interior Fish and Wildlife Service first adopted regulations establishing spring and summer subsistence hunts for migratory waterfowl by permanent Alaska residents of communities within eligible subsistence harvest areas. Over time, more communities throughout Alaska have been authorized to participate in bird subsistence harvests.[20]

User Conflicts

User conflicts between local upper Kobuk River residents and visiting hunters, commercial guides, and transporters have existed since the early 1980s, but intensified in the mid-1990s. From the 1980s into the 2000s, there were no conservation concerns for wild game in the region due to a healthy caribou population and conservative management of moose and Dall sheep populations in the area.[21] Increasing numbers of nonlocal hunters have been drawn to the area by its abundant caribou and liberal bag limits, as well as because of increasingly restricted and competitive hunting elsewhere in Alaska. Most arrived by aircraft; some arrived with guides, but most were dropped off by transporters. State regulations do not limit the number of transporters (as is the case with guides), the number of clients they leave in the area, or for the most part, where transporters put clients or how close together clients can be. Nonlocal hunters were present in greatest numbers during September, when caribou are moving through the traditional hunting areas of local residents. As was the case in the Noatak River area (Georgette and Loon 1988), in the early to mid-2000s, residents complained that aircraft-supported hunters were displacing them from traditional hunting sites. Local hunters spoke of waiting for caribou to cross the river, only to have low-flying aircraft frighten caribou away from the river crossing. Reports of hunters leaving the field with meat and antlers and discarding the meat upon reaching Kotzebue offended Inupiaq cultural values prohibiting waste. In addition to disrupting local caribou hunters, concentrated aircraft activity displaced families from valued fall fish camp sites.[22]

20. 50 CFR 92.

21. As mentioned earlier in this chapter, the 2013 census of the WAH found that the herd had declined 27% in 2 years (Jim Dau, Wildlife Biologist, ADF&G Kotzebue, personal communication, May 16, 2014).

22. James S. Magdanz, editor. 2007. *A history of human–land relationships on the upper Kobuk River*. Unpublished data. Alaska

Trophy hunting for brown bears was another source of conflict, because state regulations for general hunts in GMU 23 require that hunters salvage only the hide and skull, but not the meat. The regulations were, in some cases, limited to taking a brown bear once every four years.[23] This practice angered local residents when they found abandoned bear carcasses (Loon and Georgette 1989), and subsequently the BOG established subsistence brown bear hunting areas and annual subsistence registration permits for brown bears. Other issues have arisen from the presence of nonlocal sport fishers and local objections to catch-and-release fishing. Local residents have expressed concerns that catch-and-release fishing is damaging to and disrespectful of fish (Georgette and Loon 1990).

One significant area of conflict was a 25-mile river corridor located upstream from the study communities from the Mauneluk River past the Pah River and up to the Selby River. Because of its distance from Ambler, Shungnak, and Kobuk and its lack of mineral resources, this section of the Kobuk River was not selected by NANA under ANSCA. It was also not withdrawn for parks and preserves under ANILCA, so a majority of the land in the area was selected by the state or remained as federal public lands, and this section of the Kobuk River thus became one of the most accessible areas of the entire drainage for nonlocal hunters. In 2001 and 2002, the BOG considered but did not adopt a proposal to establish a controlled use area to address local concerns.[24] The GMU 23 Working Group was created in 2008 as an attempt to mitigate user conflict. The group continues to operate and includes representatives of regional and tribal governments, land and wildlife management agencies, and representatives of commercial guiding and transporting interests.

Study Objectives

The purpose of this study is to document contemporary patterns of subsistence uses of fish, wildlife, and plant resources, as well as traditional knowledge about these resources in 3 Kobuk River communities that may be affected by the construction of the proposed Ambler Mining District access alternatives. This study intends to provide:

1. Estimates of subsistence harvests and uses of wild fish, game, and plant resources in the 12-month study year of 2012;

2. Maps of areas used for hunting, fishing, and gathering in the 2012 study year (preceding 12 months);

3. Generalized maps of historical use areas for subsistence hunting, fishing, and gathering developed from selective interviews with subject matter experts[25];

4. Demographic information about each community, including population size and composition, ethnicity, birthplace, and length of residency in the study community;

5. Information about involvement in the cash economy, including jobs and other sources of cash income;

6. Evaluations of trends in subsistence harvests;

7. Traditional knowledge observations regarding resources used for subsistence purposes;

8. Evaluations of food security patterns for both store-bought and wild foods;

Department of Fish and Game Division of Subsistence. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

23. Under registration subsistence hunts, meat must be salvaged for human consumption. No tags are required in these hunts, and the hide and skull need not be sealed unless they are removed from the area or presented for commercial tanning.

24. James S. Magdanz, editor. 2007. *A history of human–land relationships on the upper Kobuk River*. Unpublished data. Alaska Department of Fish and Game Division of Subsistence. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

25. Extensive work on historical mapping has been undertaken prior to this study and in greater detail than was possible during the survey effort. Schroeder et al (1987) is referenced for historical mapping information and should be considered the most recent source for this information.

9. Documentation of social networks of sharing subsistence resources among households and between communities; and

10. Preliminary scoping of current issues related to subsistence hunting and fishing.

Research Methods

Alaska is also unique in the nation for having an applied anthropological research group established by statute to conduct "policy research" (Trotter II and Schensul 1998) investigating customary and traditional uses of fish and wildlife resources. The ADF&G Division of Subsistence conducts systematic social science research "on all aspects of the role of subsistence hunting and fishing in the lives of the residents of the state" (AS 16.05.094).

The duties of the division include assisting the state regulatory bodies "in determining what uses of fish and game, as well as which users and what methods, should be termed subsistence uses, users, and methods" (AS 16.05.094). The division also conducts research and applies the results of previous research to evaluate "the impact of state and federal laws and regulations on subsistence hunting and fishing," as well as to the development of "statewide and regional management plans so that those plans recognize and incorporate the needs of subsistence users of fish and game" (AS 16.05.094). This law directs the division to:

> compile existing data and conduct studies to gather existing information, including data from subsistence users, on all aspects of the role of subsistence hunting and fishing in the lives of the residents of the state;
>
> quantify the amount, nutritional value, and extent of dependence on food acquired through subsistence hunting and fishing;
>
> make information gathered available to the public, appropriate agencies, and other organized bodies. Assist the department, the Board of Fisheries and the Board of Game in determining which uses of fish and game, as well as what users and what methods, should be termed subsistence users, uses, and methods;
>
> evaluate the impact of state and federal laws and regulations on subsistence hunting and fishing and, when corrective action is indicated, make recommendations to the department;
>
> make recommendations to the boards of fisheries and game regarding adoption, amendment, and repeal of regulations affecting subsistence fishing and hunting; and
>
> participate with other divisions in the preparation of statewide and regional management plans so that those plans recognize and incorporate the needs of subsistence users of fish and game.

Much of the division's research is conducted in partnership with local communities. Projects follow the ethical principles of social sciences, which include informed consent, anonymity of participants, and directly informing communities of research findings. ADF&G policy articulates and reinforces a government-to-government relationship between the department, the boards of Fisheries and Game, and the federally recognized tribes in Alaska. It also promotes consultation and coordination with these tribes, with the goal of ensuring that the department conducts consultation in a culturally sensitive manner.

Table 1-3.–Project participants.

Task	Name	Organization
		City of Ambler
		Native Village of Shungnak
		Native Village of Kobuk
	Paul Karczmarczyk	Alaska Department of Transportation
	Jean Kornmuller	Alaska Industrial Development Export Authority
Northern Regional Program Manager	James Simon	ADF&G Division of Subsistence
Principal Investigator	Nicole M. Braem	ADF&G Division of Subsistence
Editor	Caroline Brown	ADF&G Division of Subsistence
Data Management Lead	Marylynne Kostick	ADF&G Division of Subsistence
Administrative support	Pam Amundson	ADF&G Division of Subsistence
	Tamsen Coursey-Willis	ADF&G Division of Subsistence
	DeAnne Lincoln	ADF&G Division of Subsistence
Programmer	David S. Koster	ADF&G Division of Subsistence
Data entry	Theresa Quiner	ADF&G Division of Subsistence
	Barbara Dodson	ADF&G Division of Subsistence
	Zayleen Kalalo	ADF&G Division of Subsistence
	John Dwyer	ADF&G Division of Subsistence
	Maegan Smith	ADF&G Division of Subsistence
Data cleaning/validation	Margaret Cunningham	ADF&G Division of Subsistence
Data analysis	Marylynne Kostick	ADF&G Division of Subsistence
Map Digitization	Margaret Cunningham	ADF&G Division of Subsistence
Cartography	Terri Lemons	ADF&G Division of Subsistence
Editorial Review Lead	Rebecca Dunne	ADF&G Division of Subsistence
Production Assistant	Anita Humphries	ADF&G Division of Subsistence
Field research staff	Nicole M. Braem (Ambler lead)	ADF&G Division of Subsistence
	Elizabeth Mikow (Shungnak lead)	ADF&G Division of Subsistence
	Seth J. Wilson (Kobuk lead)	ADF&G Division of Subsistence
	Andrew Brenner	ADF&G Division of Subsistence
	Jason Esler	ADF&G Division of Subsistence
	Michelle Gillette	ADF&G Division of Subsistence
	Anna Godduhn	ADF&G Division of Subsistence
	Erin Shew	ADF&G Division of Subsistence
	Lisa J. Slayton	ADF&G Division of Subsistence
Local research assistants	Jonas Cleveland	Ambler
	Rose Cleveland	Ambler
	Mina Greist	Ambler
	Paul Tickett	Ambler
	Hershel Tikik	Ambler
	Martha Wood	Ambler
	Beverly Greist	Shungnak
	Wynona Jones	Shungnak
	Lindsay Lee	Shungnak
	Evelyn Wood	Shungnak
	Murphy Custer	Kobuk
	Ethel Wood Sr.	Kobuk
	Herbert Wood	Kobuk

Ethical Principles for the Conduct of Research

The project was guided by the research principles outlined in the *Alaska Federation of Natives Guidelines for Research*[26], by the National Science Foundation, Office of Polar Programs in its *Principles for the Conduct of Research in the Arctic*[27], by the *Ethical Principles for the Conduct of Research in the North* (Association of Canadian Universities for Northern Studies 2003), and by the Alaska confidentiality statute (AS 16.05.815(d)). These principles stress community approval of research designs, informed consent, anonymity or confidentiality of study participants, voluntary participation, community review of draft study findings, and the provision of study findings to each study community upon completion of the research.

Project Planning and Approvals

Division of Subsistence staff approached each community to obtain approval for the survey work. Staff attended tribal and city council meetings to present the scope of the proposed research and to identify issues of concern to incorporate into the research design in advance of the survey effort. Tribal councils were approached and gave approval in Shungnak and Kobuk; the division partnered with the city government in Ambler.

Nicole M. Braem initiated contact with all 3 communities beginning in September 2012 by sending a letter introducing the project and following up with phone calls. The Native Village of Kobuk was the first community to approve the project, doing so on September 25, 2012, without ADF&G staff in attendance. Principal Investigator Braem and Subsistence Resource Specialist Seth Wilson traveled to Kobuk in January 2013 in order to meet with council members and consult on survey and key respondent interview designs. Braem attended a Native Village of Shungnak council meeting in January 2013, and the council approved the project by resolution on January 25, 2013. No response was received from the Native Village of Ambler (the tribal government) after multiple attempts at contact; Braem then contacted the City of Ambler. Braem attended a regularly scheduled city council meeting on February 19, 2013. The city council then approved the project by resolution. Table 1-3 identifies all project partners and staff.

Systematic Household Surveys

The primary method for collecting subsistence harvest and use information in this project was a systematic household survey. Following receipt of comments at the community approval meetings, ADF&G finalized the survey instrument in January 2013. A key goal was to structure the survey instrument to collect demographic, resource harvest and use, and other economic data that are comparable with information collected in other household surveys in the study communities and with data in the Community Subsistence Information System (CSIS[28]). Appendix A is an example of the survey instrument used in this project. For the purposes of this report, "the 2012 study year" refers to the 12-month period for which this survey collected information, which was between February 1, 2012 and January 31, 2013.

The survey goal for this project was a census of all households in the 3 study communities. Sample achievement varied in each survey effort (Table 1-4). In Ambler, a 70% sample was achieved, and 13% of households declined to participate in the study. A further 17% percent of households were not surveyed because staff was unable to make contact with them. In Shungnak, a 67% sample was achieved, with 23% of households declining to participate and a 10% rate of no contact. In Kobuk, an 83% sample was achieved; 6% of households declined to participate, and 11% were not able to be contacted. The average length of a survey varied among communities: in Ambler the average survey time was 53 minutes, in Shungnak 39 minutes, and in Kobuk 62 minutes (Table 1-5).

26. Alaska Federation of Natives. 2013. "Alaska Federation of Natives Guidelines for Research." Alaska Native Knowledge Network. Accessed May 2014. http://www.ankn.uaf.edu/IKS/afnguide.html.
27. National Science Foundation Interagency Social Science Task Force. 2012. "Principles for the Conduct of Research in the Arctic." Accessed May 2014. http://www.nsf.gov/od/opp/arctic/conduct.jsp.
28. ADF&G Division of Subsistence, Community Subsistence Information System (CSIS): http://www.adfg.alaska.gov/sb/CSIS/

Table 1-4.–Survey length, Ambler Mining District communities, 2012.

	Interview length (in minutes)		
	Average	Minimum	Maximum
Ambler	53.6	13	110
Shungnak	39.2	10	90
Kobuk	61.5	45	80

Source ADF&G Division of Subsistence household surveys, 2013.

Completed surveys were reviewed and coded by staff in the field. Surveys were reviewed a final time once staff returned to the office. Staff then photocopied the surveys and mailed them to Division of Subsistence Information Management section for data entry and analysis.

Household Survey Implementation

Ambler

In March 2013, Braem led a team of 4 other division staff, including Anna Godduhn, Erin Shew, Michelle Gillette, and Andrew Brenner, to conduct harvest surveys and key respondent interviews. Six local research assistants were hired to assist ADF&G staff with the project: Martha Wood, Paul Tickett, Jonas Cleveland, Hershel Tikik, Mina Greist, and Rose Cleveland. Introduction of the project and training of local research assistants to assist with surveying took place on March 4, 2013. Surveying began in the evening following the training and continued through March 13.

Shungnak

In March 2013, Beth Mikow led a team of 2 additional division staff, Lisa Slayton and Jason Esler, to conduct harvest surveys and key respondent interviews. Prior to entering the field, Mikow worked with Shungnak tribal administrator James Commack to advertise local research assistant positions. Four local research assistants were hired to assist ADF&G staff with the project: Lindsey Lee, Beverly Greist, Wynona Jones, and Evelyn Wood. Introduction of the project and training of local research assistants to assist with surveying occurred on March 1. Surveying began that evening and continued until March 7. The surveying effort was initially slow to proceed due to a number of residents of Shungnak traveling to Kobuk for a funeral, and this may have impacted sample achievement.

Kobuk

In February 2013, Wilson led a team of 2 additional division staff, Slayton and Michelle Gillette, to conduct harvest surveys and key respondent interviews in February 2013. Three local research assistants were hired to assist ADF&G staff with the project: Herbert Wood, Murphy Custer, and Ethel Wood Sr. Introduction of the project and training of local research assistants to assist with surveying occurred on February 6. Surveying began that evening and continued until February 10.

Mapping Locations of Subsistence Hunting, Fishing, and Gathering

During household interviews, the researchers asked respondents to indicate the locations of their hunting, fishing, and gathering activities during the study year. Interviewers marked on maps the sites of each harvest, the species harvested, the amounts harvested, and the months of harvest. Points were used to mark harvest locations, and polygons (areas) were used to mark harvest effort areas, such as areas searched while hunting moose. Some lines were also drawn in order to depict traplines or fishing that occurred at intervals along a stretch of river while traveling by boat, for example, when the harvesting activity did not occur at a specific point. Researchers had the option to map search and harvest locations during the survey or at its conclusion.

Table 1-5.–Sample achievement, Ambler Mining District communities, 2012.

	Ambler	Kobuk	Shungnak
Households in community	76	36	69
Sampled households	53	30	46
Percentage of households sampled	69.7%	83.3%	66.7%
Households unable to be contacted	13	4	7
Households declined to be interviewed	10	2	16
Sampled population	197	137	183
Estimated population	282.5	164.4	274.5

Source ADF&G Division of Subsistence household surveys, 2013.

The maps used for this project were produced by Braem and Wilson from the Division of Subsistence using ArcGIS[29] 10 software on 11″ x 17″ paper. Maps were available at 4 different scales (or extents) to accommodate both local and distant searches and harvests. The 4 sets of paper maps included 1 set of grayscale high-resolution U.S. Geological Survey topographic maps at 1:100,000 and sets of similar grayscale maps set at 1:250,000, 1:500,000, and 1:800,000. During each mapping session, researchers recorded the household's identification number, the date of the mapping interview, and the interviewer's initials on each map. All responses are confidential at the household level and only a community summary map for the various species searched for and harvested is included in this report. Harvest locations for game species are not published, and fishing harvest areas are generalized pursuant to AS 16.05.815.

Key Respondent Interviews

While researchers were in the study communities, they consulted with local governments, survey respondents, and local research assistants to identify key respondents to interview. The purpose of the interviews was to provide additional context for the quantitative data and additional background information for each community's results chapter. Key respondent interviews were semi-structured and directed by a key respondent interview protocol designed by ADF&G staff in consultation with community members (see Appendix B). In addition to gathering qualitative data through the key respondent interview protocol, ADF&G staff took notes during interviews to provide additional context for this report. All key respondent interviews were transcribed and then analyzed along with interview notes in preparation for this report. Key respondents were informed that their names would not be included in this report in order to maintain confidentiality. The number of key respondent interviews varied among communities.

Survey Data Entry and Analysis

All data were coded for data entry by Division of Subsistence staff during fieldwork. In order to ensure that unusual, unexpected, and illogical responses were verified to rule out collection errors, this process may include re-contacting households for final validation. Responses were coded following standardized conventions used by the Division of Subsistence to facilitate data entry. Information Management staff within the Division of Subsistence set up database structures within Microsoft SQL Server at ADF&G in Anchorage to hold the survey data. The database structures included rules, constraints, and referential integrity to ensure that data were entered completely and accurately. Data entry screens were available on a secured Internet site. Daily incremental backups of the database occurred, and transaction logs were backed up hourly. Full backups of the database occurred twice weekly. This ensured that no more than 1 hour of data entry would be lost in the unlikely event of a catastrophic failure. All survey data were entered twice and each set compared in order to minimize data entry errors.

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

Once data were entered and confirmed, information was processed with the use of Statistical Package for the Social Sciences (SPSS) software version 21. Initial processing included the performance of standardized logic checks of the data. Logic checks are often needed in complex data sets where rules, constraints, and referential integrity do not capture all of the possible inconsistencies that may appear. Harvest data collected as numbers of animals, or in gallons or buckets, were converted to pounds usable weight using standard factors (see Appendix C for conversion factors).

ADF&G staff also used SPSS for analyzing the survey information. Analysis included review of raw data frequencies, cross tabulations, table generation, estimation of population parameters, and calculation of confidence intervals for the estimates. Missing information was dealt with on a case-by-case basis according to standardized practices, such as minimal value substitution or using an averaged response for similarly-characterized households. Typically, missing data are an uncommon, randomly-occurring phenomenon in household surveys conducted by the division. In unusual cases where a substantial amount of survey information was missing, the household survey was treated as a "nonresponse" and not included in community estimates. ADF&G researchers documented all adjustments.

Harvest estimates and responses to all questions were calculated based upon the application of weighted means (Cochran 1977). These calculations are standard methods for extrapolating sampled data. As an example, the formula for harvest expansion is

$$H_i = \overline{h}_i S_i$$

where:

$\overline{h}_i = \frac{h_i}{n_i}$ mean harvest per returned survey,

H_i = the total harvest (numbers of resource or pounds) for the community *i*,

h_i = the total harvest reported in returned surveys,

n_i = the number of returned surveys, and

S_i = the number of households in a community.

As an interim step, the standard deviation (SD), or variance (V; which is the SD squared), was also calculated with the raw, unexpanded data. The standard error (SE), or SD, of the mean was also calculated for each community. This was used to estimate the relative precision of the mean, or the likelihood that an unknown value would fall within a certain distance from the mean. In this study, the relative precision of the mean is shown in the tables as a confidence limit (CL), expressed as a percentage. Once the standard error was calculated, the CL was determined by multiplying the SE by a constant that reflected the level of significance desired, based on a normal distribution. The constant for 95% confidence limits is 1.96. Though there are numerous ways to express the formula below, it contains the components of an SD, V, and SE.

Relative precision of the mean (CL%):

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

where:

s = sample standard deviation,

n = sample size,

N = population size, and

$t_{\alpha/2}$ = Student's t statistic for alpha level (α=.95) with n–1 degrees of freedom.

Small CL percentages indicate that an estimate is likely to be very close to the actual mean of the sample. Larger percentages mean that estimates could be further from the mean of the sample.

The corrected final data from the household surveys will be added to the Division of Subsistence CSIS. This publicly-accessible database includes community-level study findings.

Population Estimates and Other Demographic Information

As noted above, a goal of the research was to collect demographic information for all year-round households in each study community. For this study, "year-round" was defined as being domiciled in the community when the surveys took place and for at least 3 months during the 12-month study period. Because not all households were interviewed, population estimates for each community were calculated by multiplying the average household size of interviewed households by the total number of year-round households, as identified by Division of Subsistence researchers in consultation with community officials and other knowledgeable respondents.

There may be several reasons for the differences among the population estimates for each community and other demographic data that are generated from the division's household surveys and estimates developed by the 2010 federal census (U.S. Census Bureau 2011), the U.S. Census Bureau's American Community Survey (ACS), and the Alaska Department of Labor and Workforce Development (ADLWD n.d.). The timing of the demographic data collection among the different agencies likely had an impact, particularly with the 2-year difference between the 2010 census data and this study's estimate of 2012 populations. The population estimates of this study fall within the margin of error given for the 5-year average (2008–2012) from the ACS data. Timing of data collection, differences in method, and varying definitions of residency eligibility can all account for differences in population estimates among the studies.

Map Data Entry and Analysis

ADF&G information management staff checked maps for consistency with data recorded on the survey forms. They also removed extraneous marks from the maps to ensure the digitizing process would occur with minimal error. The map design included tick marks, similar to registration marks, used to pinpoint geographical features and thus provide accuracy during the digitizing process. Each map could then be aligned by the staff who digitized the polygons, points, and lines that researchers had drawn by hand on the

Table 1-6.–Community review meeting information, Ambler Mining District communities, 2012.

	Ambler	Shungnak	Kobuk
Date	February 13, 2014	February 4, 2014	December 14, 2014
In attendance	City council members, staff, and two local residents	Tribal council members, tribal administrator, and no local residents	Tribal council members, two tribal government staff, and four local residents

Source ADF&G Division of Subsistence household surveys, 2013.

paper maps during the interviews. The final wild resource harvest area maps included in this report were produced by ADF&G Division of Subsistence staff. Maps were reviewed at a community review meeting to ensure accuracy as well identify any data the community would like to keep confidential.

Network Analysis

A "network" section asked households to document who in the household harvested and processed the resources that the household used. It also asked household members to document from which households or other communities they received resources. In this way, data analyzed from the network module provide a graphic representation of resource distribution webs by community.

Food Security Analysis

A "food security" section of the survey used a modified version of a standard national questionnaire to assess whether or not households had enough food to eat, whether from subsistence sources or from market sources. The protocol used in this survey was based on the 12-month food security scale questionnaire developed by the U.S. Department of Agriculture (USDA) that was modified by ADF&G to account for the presence of subsistence harvested foods (in addition to purchased or store-bought foods) in local diets. The USDA questionnaire is administered nationwide each year as part of the annual Current Population Survey (CPS). In 2007, approximately 125,000 U.S. households were interviewed, including 1,653 in Alaska (Nord et al. 2008). From CPS data, the USDA prepares an annual report on food security in the United States.

Food security protocols have been extensively reviewed (Coates 2004; Webb et al. 2006; Wunderlich and Norwood 2006) and have been used around the world, including in northern Burkina Faso (Frongillo and Nanama 2006), Bangladesh (Coates et al. 2006), Bolivia and the Philippines (Melgar-Quinonez et al. 2006), and Brazil (Pérez-Escamilla et al. 2004). Although there have been efforts to develop a universal food security measurement protocol (Swindale and Bilinsky 2006), researchers often modify the protocol slightly to respond to community social, cultural, and economic circumstances, as was done for this survey effort.

For this study, the food security protocol was modified by the addition of several questions designed to determine whether food insecurities, if any, were related to subsistence foods or store-bought foods. Additionally, the wording of some questions was changed slightly. For example, rather than ask households if they worried about running out of food before they got money to buy more, respondents were instead asked if they were ever worried that their household would not have enough food. If the household answered "yes," a follow-up question asked if this was because the household could not get subsistence foods, store-bought foods, or both kinds of foods. Also, as in Brazil (Pérez-Escamilla et al. 2004), the USDA term "balanced meals" was difficult to interpret for indigenous Alaska populations. Earlier versions of the ADF&G questionnaire had substituted the term with "healthy meals," but that, too, proved problematic. For this survey, to reflect the unique dietary and cultural circumstances in rural Alaska, households were

instead asked if a lack of resources (defined as a lack of what households need to hunt, fish, gather, or buy food) caused them to be unable to get the kinds of foods they wanted to eat.

Community Review Meetings

ADF&G staff presented preliminary survey findings and associated search area and harvest maps at a meeting in each community. Table 1-6 shows when a community review meeting occurred in each study community and how many community residents attended.

Community review of initial findings occurred in Ambler at a regularly scheduled meeting of the Ambler City Council on February 13, 2014. Notice of the presentation was posted at the Ambler City Office and announced over VHF radio. Two community members were in attendance. Council members asked several questions about the presentation figures as well as the possible impacts of the proposed road on subsistence. One council member focused on the effects of increased access to the area for nonlocal Alaskan hunters.

In Shungnak, tribal administrator James Commack worked with Mikow to schedule a community review meeting for the February 4, 2014 tribal council meeting. The community review meeting was advertised with fliers to make the public aware of the community review, and it was attended by the 6 members of the council and the tribal administrator. The meeting took place in the Shungnak Tribal Office. Council members felt the data accurately represented the 2012 harvest year. They reiterated concerns over the poor fishing season during the study year as well as issues of caribou migration and environmental change. More detail regarding these local concerns can be found in the Shungnak chapter of this report.

A community review in Kobuk took place on December 14, 2013 at a regularly scheduled meeting of the Native Village of Kobuk. Five tribal council members, 2 staff, and 4 community members attended. Questions generally related to clarification of presentation figures, the study period, and regulations.

Final Report Organization

Findings are organized by study community, with chapters ordered by community placement on the Kobuk River beginning with Ambler and continuing upriver to Shungnak and Kobuk. While this introduction has covered the regional background of the upper Kobuk River in general, more detailed descriptions of each community's settlement history and contemporary setting can be found within each chapter.

Each chapter includes tables and figures that report findings on demographic characteristics, employment characteristics, and characteristics of resource harvests and uses—including the sharing of wild foods and trends over time. Other topics such as food security and household self-assessments of use are also included. Maps showing hunting, fishing, and gathering areas used by each community in 2012 are included in individual chapters. Table D1-1 shows selected study findings for Ambler, Shungnak, and Kobuk and will be referenced in each community's chapter discussing survey results. Each chapter ends with a summary of concerns shared by local respondents.

The content in terms of 2012 harvest data is consistent in each chapter because it is based on the survey instrument; however, there are differences in descriptions of historical trends because each community has a different history of participation in subsistence harvest surveys. Some have had a comprehensive harvest survey before, while others have only participated in limited scope surveys such as annual subsistence salmon harvest monitoring or big game surveys. Detailed comparison of 2012 data to prior studies can be found in the individual chapters of this report. The final chapter of the report provides a short, general overview of the patterns of harvest and uses of wild resources in the study communities.

Nicole M. Braem

Plate 2-1.–Aerial view of Ambler, March 2013.

2. AMBLER

Nicole M. Braem

Community Background

Ambler (Ivisaappaat) is located on the north bank of the Kobuk River, near the confluence of the Ambler and the Kobuk rivers (Plate 2-1). The river for which the town is named was given its name in 1890 by Lt. G.M. Stoney for Dr. James M. Ambler, a U.S. Navy surgeon who died in 1881 while on an Arctic expedition under Lt. Commander G.W. DeLong (Orth 1971rep.). Its local name comes from the Inupiaq name for the Redstone River, *Ivisaaq,* red stone, and *paat,* the word for mouth (ABL03020713; Anderson et al. 1977:705).

The community lies 45 miles north of the Arctic Circle and is 138 air miles northeast of the regional hub Kotzebue. Its nearest neighboring village, Shungnak, is located 30 miles upriver. Ambler is located within the continental climate zone. Average temperatures range from 10°F to 15°F in winter and 40–65°F in the summer. Extreme temperatures may drop to -65°F or rise to 92°F. Annual snowfall averages 80 in, and Ambler receives an average of 16 in of precipitation per year.[1]

The physical environment surrounding the community is dominated by the Kobuk River, numerous tributaries, sloughs, and small lakes. Both tundra and boreal forest occur, with typical plant communities associated with each. The tundra supports mosses, lichens, sedges, and grasses, while the boreal forest hosts willow, alder, birch, and white and black spruces. The occurrence of tundra and forest is influenced by permafrost, elevation, drainage, and fire history. Three mountain ranges border the community to the north. The Baird Mountains lie on the west, and the Schwatka Mountains rise to the east; closest to the community, the Jade Mountains are a local landmark and noted source of nephrite jade.[2] Three active sand dunes covering 348 square miles lie west of Ambler on the south side of the Kobuk River: the Great Kobuk, Little Kobuk, and Hunt River sand dunes.[3] A large lowlands area extending south of the Kobuk River is broken up by various smaller mountain ranges, such as the Waring Mountains and Sheklukshuk Range.

1. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau: "Alaska Community Database Online: Community Information." Accessed May 13, 2014. http://commerce.alaska.gov/cra/DCRAExternal/community

2. In prehistoric times, Kobuk River people used nephrite jade in the manufacture of tools. Northwest Alaska was an important source of jade that was traded across Alaska, to the Yukon and Kuskokwim regions, as well as across Alaska's North Slope and across the Bering Strait to Chukotka (Giddings Jr. 1952; Montgomery 1999; Simon 1998:80).

3. National Park Service (NPS): "Geology fieldnotes, Kobuk Valley National Park Alaska." Accessed May 14, 2014. http://www.nature.nps.gov/Geology/parks/kova/index.cfm

Steve McCutcheon, McCutcheon Collection, Anchorage Museum, B1990.14.5.AkNative.15.21.3

Plate 2-2.–Ambler grew rapidly after its establishment in 1958. Women and children on beach at Ambler, July 25, 1962.

There is a rich archaeological record in the Kobuk River valley and in the vicinity of modern-day Ambler. In the 1940s, J.L. Giddings investigated reported sites near the Hunt River, Jade Creek, Onion Portage, Redstone River, Ambler Island[4], the mouth of the Ambler River, and the Black River (Giddings Jr. 1952). The most famous site, Onion Portage, is among the oldest in Alaska and is considered the "type" site for the Paleo-Arctic tradition (11,000–6,000 BP). It is also an important site in the Northern Archaic tradition that followed; excavations have found a large body of materials evidencing its use by nomadic groups of hunters as a caribou hunting site.

In the more recent past, a variety of small nomadic Inupiaq groups inhabited the area in mid-19th century, after a period of occupation by Koyukon people. Burch Jr. (1998) divided the Inupiat of the Kobuk River valley into 3 nations; 2 of these, the Akuniġmiut and Kuuvaum Kaŋiaġmiut, had fall and winter settlements in the vicinity of modern-day Ambler. These settlements included Ivisaappaat, Imaġluktuq, Tulukkaat, and Kuugruaq.

Ambler is the most recently settled community in the NANA region. In the winter of 1958–1959, 8 families from Shungnak traveled downriver and overwintered at Ambler Island. Subsequently, they submitted an application for a townsite at the current location, which conflicted with a Native allotment application for 160 acres that had already been filed by Tommy Lee.[5] The town grew at the townsite, and it took several decades for the conflict over the land to be resolved; this was a source of tension in the community. The Lee family eventually received the balance of the original allotment (an additional 155 acre allotment) adjacent to the townsite.

The reasons for the choice of location were simple—it was known as a good place from which to base caribou hunting and fishing:

4. Ambler Island is a local name for the island in the Kobuk River at the mouth of the Ambler River.

5. Alaska Natives were eligible to file for 160 acre allotments. After receiving the townsite application, the Bureau of Land Management (BLM) reduced Lee's allotment had been reduced to 5 acres. Ultimately, the Lee family settled with BLM, and the townsite remained as it had developed.

> I'm going to tell about Ambler, according to what I have heard, as my father used to tell about it. In 1898, white people came and then they lived there in Ambler. And later, when we were old enough to remember, Kilvaġiaq's [Happy Jack's] family lived there too. Kilvaġiaq's family were Ambler people. People from Shungnak came to join them there also. It is a good place for fishing and hunting caribou and a good place for hunting bears. They remained there. (Gray in Fienup-Riordan and Kaplan 2007)

"Some elders had let them know that this was a great area, there was an abundance of caribou, fish, and there's a great life down here. Where you can, there's 2 rivers" (ABL04021013) (Plate 2-2).

The federal government established a post office in 1963, and Ambler incorporated as a second-class city in 1971. A federally recognized tribe, the Native Village of Ambler, is also present.

From 1960–1976, the State of Alaska provided only a kindergarten–8th grade education locally. Those wishing to obtain a high school diploma had to attend school elsewhere, either in another community with a high school or at a boarding school such as Mt. Edgecumbe, the Wrangell Institute, or Chemawa Indian School. Since 1977, the Northwest Arctic Borough School District has operated the school in Ambler. In 1979, the school began to offer high school classes. In 2004, the school district built a new high school and elementary school adjacent to the older structure.

Between 2003[6] and 2012, needed infrastructure projects (runway repairs, a new sewage lagoon, new washeteria, etc.) were put on hold due to health concerns about local asbestos sources, particularly as they related to dust generated by all-terrain vehicle (ATV) traffic.

In 2012, the town's water supply came from a 167 ft well; it was treated at a local water treatment facility and stored in a 210,000 gal insulated water tank. Most homes were connected to the water and sewer system. Sewage was piped to a sewage lagoon and discharged into a natural watershed and then to the Kobuk River. A small, unpermitted, 3-acre landfill was located 2 miles west of the community.[7] Electricity (generated with diesel fuel) came from an Alaska Village Electric Cooperative power plant. In 2012, with power cost equalization, Ambler residents paid $0.22 for the first 500 kWh, $0.62 per kWh for the next 200 kWh, and $0.52 per kWh afterward; that resulted in a cost of $388.75 per 1,000 kWh.[8] The Maniilaq Association operated a village health clinic staffed with community health aides. Public safety has been provided at different times by a village police officer hired by the City of Ambler or a village public safety officer; the nearest Alaska State Trooper was posted in the regional hub of Kotzebue. Under Alaska's local option law, the community has banned the sale and importation of alcohol.

Two stores sold groceries, clothing, and other necessities such as ammunition, tools, spark plugs, and household goods. A lodge offering guided fishing, wildlife viewing, and hiking operated out of the community. In 2012, the Native Village of Ambler fuel project sold fuel oil and gasoline, and the city sold stove oil. One of the primary concerns expressed by community members during fieldwork in 2013 was repeated instances during which no gasoline was available for purchase for weeks or months at a time.

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6. In 2003, the discovery of naturally occurring asbestos in the gravel pit at Ambler brought most projects to a halt. The pit had been a source of construction gravel since the 1960s. Over the next decade, environmental sampling and several health investigations were carried out to determine the incidence of asbestos-related diseases, the risks posed by the asbestos, the location of deposits, and the history of asbestos mining. In 2012, the Alaska Department of Health and Social Services, Section of Epidemiology, reviewed health-related records for Ambler, Kobuk, Shungnak, and Kiana and found no incidence of or mortality from mesothelioma or diagnosis of asbestos-related disease. Coupled with Geographic Information System (GIS) data and the location of Alaskans with malignant mesothelioma cases, they found no correlation between locations of mesothelioma cases and locations of naturally occurring asbestos (www.hss.state.ak.us/dph/chronic/). In 2012, the Alaska State Legislature passed a bill sponsored by Kotzebue Representative Reggie Joule that relaxed the limits governing use of gravel containing asbestos.

7. Alaska Department of Environmental Conservation (ADEC), Division of Environmental Health, Solid Waste Program, Anchorage. "Solid Waste Information Management System: Ambler Landfill." Accessed May 22, 2014. http://dec.alaska.gov/Applications/EH/SWIMS/WEAR.aspx?SiteId=428

8. Anchorage Municipal Light and Power customers, by comparison, paid $139.18 for the same amount of use; Fairbanks paid $216.13. (University of Alaska Fairbanks Cooperative Extension: "Alaska Food Cost Survey." Accessed June 15, 2014. http://www.uaf.edu/ces/hhfd/fcs)

Sometimes this occurred during an important subsistence period (i.e., during fall caribou hunting season). In 2014, the city also sold gasoline; however, it only did so when the tribal project had run out.

Like the rest of the region, Ambler was not connected to the state road system. Daily transportation and freight shipment to Ambler was provided by 2 local air carriers based in Kotzebue. Fuel and other goods could arrive by barge when river conditions permitted. The school had fuel delivered by barge, but the gasoline and stove oil sold by the tribal fuel project arrived via air transport. As a result, the prices local residents paid for fuels were among the highest in Alaska. Residents traveled between Ambler and other communities by snowmachine in the winter and small boat in open water months.

Seasonal Round

Ambler's seasonal round is similar to that of Kobuk and Shungnak, because it is patterned upon the same resource base. Its contemporary seasonal round differs from earlier patterns in the area, primarily in its sedentism. Men no longer leave the community in summer months to hunt caribou, Dall sheep, and other land mammals in the upper Noatak River valley or Brooks Range. In addition, families no longer spend the spring at muskrat camp, an activity that in times past provided for both the cash and subsistence economies. Finally, because most families now travel by snowmachine instead of dogteam, they no longer have to harvest sizeable quantities of fish and game to feed their dogs.

Several factors precipitated these changes. The return of caribou to the Kobuk River valley in the mid-1940s removed the need to travel great distances for meat. The muskrat population declined, and the government began to require children to attend school. Still, there were many residents present at the time of survey who remember that as children, they moved seasonally from camp to camp with their parents. One respondent described the 5 or 6 camps that her family used throughout the year, starting with spring camp on the Pah River. Her family traveled by dogteam before the ice went out; they harvested muskrat, geese, and ducks, and they fished in the sloughs. "We don't have income much in those days. So, you know, these camps, spring camp, they hunt muskrat so they could trade to Native store. The store, and send them out to Seattle. They trade for food." She added:

> We don't have that much bear. Not much moose. No caribou. But they go out over the range, Brooks Range, and go get caribou. And in springtime, they go and stay out there 'til maybe August. And they go out through Ambler River, with a raft or up here through Kollioksuk, or Mauneluk, or Anelagaggerak [Reed River], someplace up there. Or Akurevik [Beaver Creek]. After they get caribou and dried them up, when we move here, oh they get, ah, what you call … *siksrik*, ground squirrel, they get ground squirrel too, dry them up and bring them, oh, they're so good, dried. (ABL05021013)

Fishers used to harvest least cisco, *qaluusraaq,* in large quantities for both human and dog food. "We used to seine them, and get plenty of them. But nobody hardly seine those anymore because there are no dogs" (ABL03020713). Another mentioned that if fishing were poor earlier in the season, people could seine many of them in the fall (ABL05021013). They would be dried, frozen for *quaq*[9], or aged. Longnose suckers also used to be taken in greater numbers.

In spring, from late March to mid-May, the length of day increases further, as do daytime temperatures. However, snow conditions remain suitable for travel by snowmachine or dogteam. This leads to increased activity on the land by local residents. Residents may hunt small groups of caribou that overwintered nearby. Later in the spring, they also hunt caribou when the Western Arctic caribou herd (WAH) begins its spring migration north to the calving grounds.

As geese and ducks arrive, hunters use snowmachines or boats to get to good hunting locations. "As you soon as you start seeing ground, then they will start listening for geese," noted one respondent (ABL06021013). Shortly after breakup, which typically occurs in mid- to late May, fishers set nets in the mouths of creeks and

9. Quaq is frozen meat or fish that is sliced and eaten raw. Different species may be consumed as quaq, including whale, caribou, saffron cod, Dolly Varden, and various whitefishes. Some households "age" quaq by allowing it to freeze and thaw during the fall for a period of time.

slough and may catch whitefishes, northern pike, and longnose suckers, along with some Arctic grayling and humpback whitefish.[10] They set the nets while the water is still muddy.

> As breakup progresses, flood waters back up into slough and lowland lakes and marshes. Run-off melt water adds to the volume of water temporarily stored in these areas. As the water volume increases, the oxygen content of the water also rises. As this happens, whitefish, pike, and other fish move from the deep pools in the main river into the side streams and sloughs to feed on submerged vegetation or to prey on other fish. (Anderson et al. 1977:207)

During fieldwork in 2013, an elder resident suggested that one way fishers could adjust to high water conditions was to set nets in creeks and sloughs because fish will seek shelter in the smaller waterways; this was confirmed by a key respondent (ABL07021013).

In the past, a few Ambler families would travel by boat to the coast to hunt marine mammals near Kotzebue. This is not a common practice anymore. Two key respondents remembered doing so with their families when they were young. "It used to be too hot for my mom in the summer, so we used to travel down where it's cooler. So they start hunting and every spring we used to go down right after breakup" (ABL06021013).

> My father, we never hunted um, walrus. He just went for the seal oil. And it was a long ways, and he would share. On the way home, he would be at relatives in Noorvik, he share there. We have relatives in Kiana, he gave them there. Then we go home. When we go home, then he gives them there. That's how we operate, usually, he likes to give his relatives related all the way down. (ABL04021013)

Steve McCutcheon, McCutcheon Collection, Anchorage Museum, B1990.14.5.AkNative.23.330

Plate 2-3.–Mamie Cleveland with a bark basket used to save fish eggs, Ambler village, Kobuk River, July 25, 1962. Whitefish eggs are considered a delicacy and may be eaten raw, aged, or mixed with cranberries to make "ittupalak," a dessert.

Rod and reel fishing for northern pike, Arctic grayling, and sheefish begins when the river clears, and it occurs all summer. June temperatures can be too warm to dry fish successfully, but fishing activity resumes in July when sheefish arrive and continues throughout the summer. Chum salmon follow the sheefish, and residents harvest both species with set gillnets. Fishers set gillnets in eddies along the Kobuk River mainstem. Incidental take of other fish species, such as Arctic grayling, Dolly Varden (known locally as "trout"), northern pike, and other whitefishes occurs. In July and August, fishers seine for salmon and whitefishes along sandbars where the water is deep and has little current; typically, they fish in the Ambler or Kobuk rivers. Residents gather a variety of vegetation during the summer months while young plants are tender and before they become strong-tasting.

Fall is arguably the most important season from a subsistence standpoint:

10. In Andersen et al. (1977:139), authors noted, "gill nets can be first set at certain creeks where water flows out over the ice before breakup. This catch is largely broad whitefish, along with some pike."

residents devote substantial effort to hunting, gathering and fishing. Caribou hunting is at its most intensive, and hunting for migratory waterfowl resumes. Residents also hunt for moose and black bears, and they pick berries. Fishers employ both seine and set gillnets. Whitefishes swimming upriver toward spawning locations are in prime shape and full of eggs, and seining is an extremely efficient means by which to harvest large numbers of whitefishes in a short amount of time (Plate 2-3). Cooler temperatures mean that fish are less likely to spoil when drying, and as the season progresses, they can be aged for quaq. In September, salmon have very little fat, so they are easily dried.

Immediately after freeze up, usually around mid-October, gillnets are set under the ice.

> The largest catches are of humpback whitefish, which are migrating down the river at this time. At Ambler, between one thousand and two thousand of these fish may be taken in a few weeks' time. Other species caught by gill netting include broad whitefish, sheefish, Arctic char, and burbot (mudshark). (Georgette and Loon 1990:15)

Residents tend the nets through November or December. They cease when the run is over, when it grows too difficult to open the holes each day, or when conditions such as slush begin to threaten loss of the net. "Sometimes when it's freezing up, the ice sure gather, and when they put their nets down it will get caught with all that slush under … and they'll have to pull it off and then move it and you have to find the right spot" (AB06021013).

Fishers begin jigging through the ice for Arctic grayling, northern pike, and burbot in early winter. Although fish traps were once an important part of winter fishing, they are no longer built at Ambler. One key respondent remembered traps put in by Kopsheshut Creek for burbot in the past (ABL05021013).

Population Estimate and Demographic Information

Ambler grew steadily since its first census in 1960 until about 1990 (Figure 2-1). Between 1990 and 2000 the population was stable, but since 2000 it has shown a modest decline. The 53 households surveyed in this project included 197 people; expanding for unsurveyed households, this project estimated Ambler's 2012 population to be 283 (Table 2-1). By comparison, the Alaska Department of Labor and Workforce Development (ADLWD) estimated Ambler's population to be 271 people in 2012 (ADLWD n.d.). Demographic information collected in this study found that households ranged in size from 1 to 11 people,

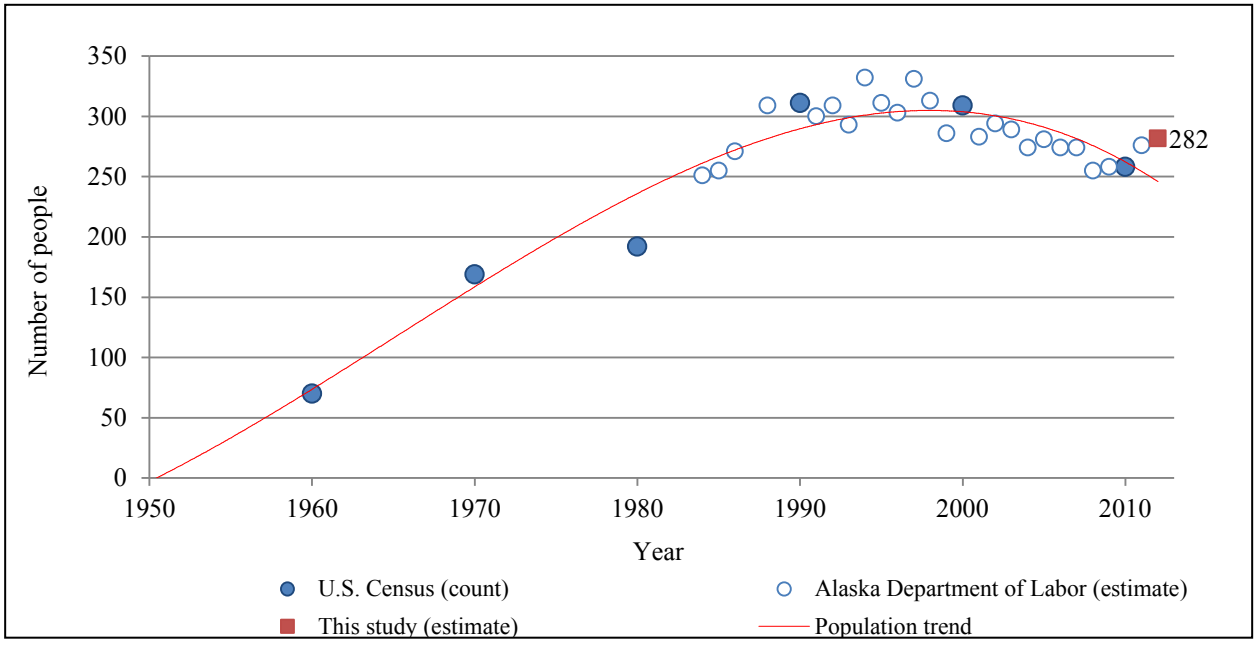

Figure 2-1.–Historical population estimates, Ambler, 1950–2012

Table 2-1.–Demographic and sample characteristics, Ambler, 2012.

Table 2-1.–Demographic and sample characteristics for Ambler, 2012.

Characteristics	Community Ambler
Sample achievement	
Sampled households	53
Eligible households	76
Percentage sampled	69.7%
Sampled population	197
Estimated population	282.5
Household size	
Mean	3.7
Minimum	1
Maximum	11
Age	
Mean	31.8
Minimum	0
Maximum	91
Median	26
Sex	
Estimated male	
Number	137.7
Percentage	48.7%
Estimated female	
Number	144.8
Percentage	51.3%
Length of residency	
Population	
Average	24.4
Minimum	0
Maximum	91
Household heads	
Average	38.2
Minimum	0
Maximum	91
Alaska Native	
Estimated households	
Number	60.2
Percentage	79.2%
Estimated population	
Number	245.2

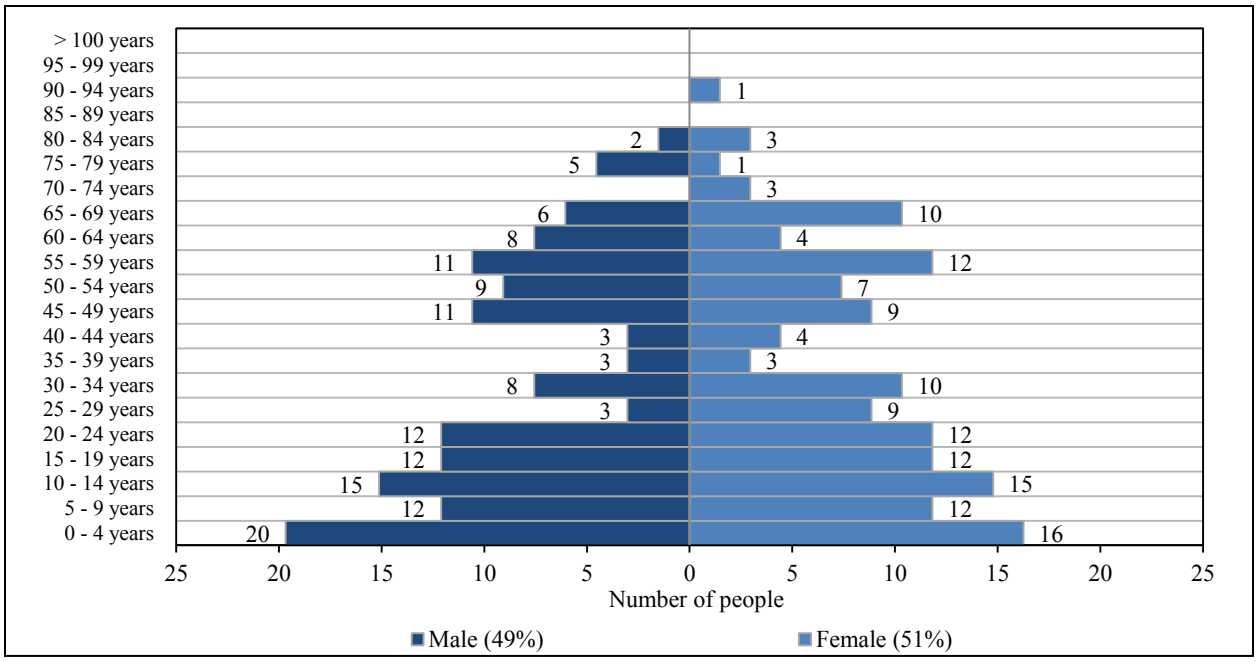

Figure 2-2.–Population profile, Ambler, 2012.

with an average of 4 people per household (Table 2-1). Ages in surveyed households ranged from less than 1 year to 91 years old; the average age was 32. Alaska Native people composed 87% of the estimated population.

Broken down by gender, 49% of the population (138) was male, and 51% of residents (145) were female (Figure 2-2). The higher percentage of females runs contrary to published articles describing female "flight" from rural areas that have resulted in higher ratios of males to females in some parts of rural Alaska (Hamilton and Seyfrit 1994; Martin 2009; Seyfrit et al. 1998). With its large base, the shape of the population pyramid" in Figure 2-2 points to a capacity for rapid growth. However, there is a constriction in the age cohorts between 25 and 45 years of age for both sexes. This constriction would suggest that grandparents are raising their grandchildren, which is not an uncommon situation in rural Alaska.

On average, residents had lived in Ambler for 24 years (Table 2-1). For heads of households, the average length of residency was 38 years. About one-half of household heads were born in Ambler (52%) (Table D2-1). Another 24% were born in other places in Alaska, most of which were in the NANA region, such as Kotzebue, Noatak, Noorvik, and Shungnak; a small percentage named Allakaket or Alatna. The remaining 24% were born outside Alaska, and a fraction of those were born outside the United States.

Income and Cash Employment

Respondents were asked about income earned from jobs (by all household members 16 years old and older) and income from other sources such as the Alaska Permanent Fund dividend, Social Security, and public assistance. The survey also asked about months worked and the work schedule for each job. This study estimated Ambler's total income for 2012 to be $4.8 million (Table 2-2). Of that, $3.5 million (72%) came from wage earnings, and $1.3 million (28%) came from other sources. The mean household income was $63,255; per capita income was $17,017 (Table D1-1). The median household income was $52,757[11] (Table D2-2).

11. The median value is the more useful measure in understanding the income of a "typical" household. Mean (average) values can be skewed high by the presence of a few households that earn a great deal more than the rest. Most research describing income reports results by median value.

Table 2-2.–Estimated earned and other income, Ambler, 2012.

Income source	Number of people	Number of households	Total for community	Mean per household[a]	Percentage of total[b]
Earned income					
Local government	53.1	37.3	$1,542,476	$20,296	32.1%
Services	31.5	26.8	$868,950	$11,434	18.1%
Mining	8.6	6.0	$276,142	$3,633	5.7%
State government	10.0	7.5	$257,864	$3,393	5.4%
Retail trade	8.6	6.0	$212,701	$2,799	4.4%
Construction	2.9	3.0	–	–	–
Federal government	4.3	4.5	$65,184	$858	1.4%
Transportation, communication, and utilities	4.3	4.5	$64,136	$844	1.3%
Agriculture, forestry and fishing	2.9	3.0	–	–	–
Manufacturing	4.3	4.5	$6,738	$89	0.1%
Earned income subtotal	**122.5**	**65.6**	**$3,463,590**	**$45,574**	**72.0%**
Other income					
Native corporation dividend		58.8	$311,130	$4,094	6.5%
Food stamps		20.7	$233,527	$3,073	4.9%
Alaska Permanent Fund dividend		74.6	$215,292	$2,833	4.5%
Social Security		22.9	$195,013	$2,566	4.1%
Pension/retirement		10.0	$88,649	$1,166	1.8%
Unemployment		14.3	$71,310	$938	1.5%
Energy assistance		26.1	$58,568	$771	1.2%
Supplemental Security income		9.2	$39,629	$521	0.8%
CITGO fuel voucher		60.2	$35,144	$462	0.7%
Disability		4.6	$34,381	$452	0.7%
Other		2.9	–	–	–
Adult public assistance		4.9	$15,558	$205	0.3%
Child support		4.6	$13,680	$180	0.3%
TANF (temporary cash assistance for needy families)		3.2	–	–	–
Longevity bonus		5.2	$2,375	$31	0.0%
Other dividend/interest		1.7	–	–	–
Foster care		0.3	–	–	–
Meeting honoraria		0.3	–	–	–
Workers' compensation/insurance		0.0	$0	$0	0.0%
Veterans assistance		0.3	–	–	–
Other income subtotal		**74.9**	**$1,343,813**	**$17,682**	**28.0%**
Community income total			**$4,807,403**	**$63,255**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2013.
Note "–" indicates that for confidentiality, income amounts are not listed for sources reported by fewer than 4 persons or households.
a. Means are based on all households in the community, not the number of households in the income category.
b. Income by category as a percentage of the total community income from all sources (wage-based income and non-wage-based income).

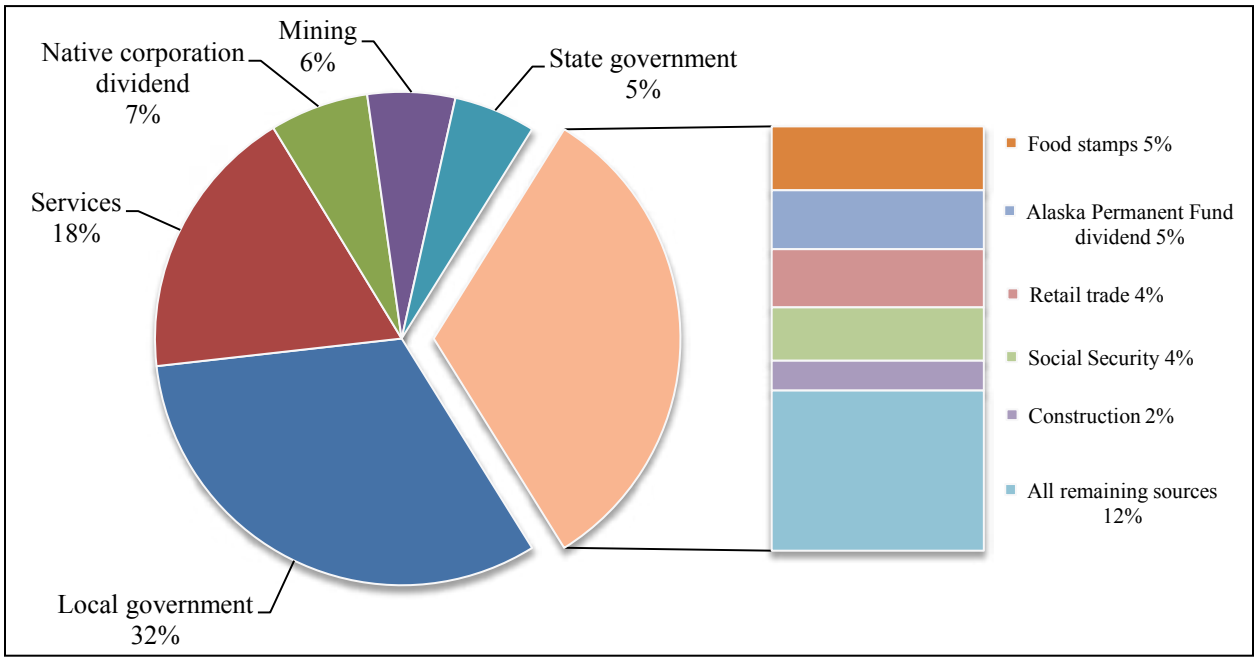

Figure 2-3.–Top 10 income sources, Ambler, 2012.

By comparison, the ADLWD estimated total income from wages to be $3.2 million.[12] ADLWD does not provide comparable statistics on mean income or overall income, but the American Community Survey (ACS)[13] does. The 2008–2012 ACS estimated that mean household income in Ambler was $54,254 and per capita income was $13,204.[14] The ACS estimated that Ambler's median income between 2008 and 2012 was $43,333. The differences between results may be due to differences in sample size and missing data. In this study, income information was missing for 48% of the jobs reported by respondents.

Figure 2-3 shows the top income sources in Ambler, both from wages and other income sources. One-half of the total community income came from just 2 sources: employment in local government and service occupations. The category "local government" includes work at the school, and city and tribal governments. The services sector includes health care, social services, and tourism or guiding. Other significant sources of income, ranked by contribution, include Native corporation dividends, mining, employment with state government, food stamps (the Supplemental Nutrition Assistance Program), and the Alaska Permanent Fund dividend (PFD).

Wages earned in local government and service occupations dominated overall income, and they were an even larger portion of earned income (Table 2-2; Figure 2-3). Together, they made up 70% of all earnings from jobs, $2.4 million of $3.5 million total. Employment in the mining industry was the next largest source of earned income, 8% of the total, followed by state government and retail trade. Jobs held in construction and the remainder of earned income categories brought in wages more than $300,000, or 9% of all earned income.

An estimated 123 persons over the age of 16 (65%) were employed during the study period (Table D2-3). The number of jobs held by employed adults ranged from 1 to 3, with an average of 1. On average, they

12. Alaska Department of Labor and Workforce Development (ADLWD), Research and Analysis Section. Juneau, n.d. "Alaska Local and Regional Information: Ambler city." Accessed August 7, 2014. http://live.laborstats.alaska.gov/alari/index.cfm
13. The American Community Survey (ACS) uses a series of monthly samples to provide demographic, social, economic, and housing information every year; in 2005, it replaced the Census Long Form questionnaire. For small geographical areas, ACS uses 5 years of samples (in this case, the years 2008–2012) to come up with an estimate. After the initial 5-year sample, small area data are produced annually (U. S. Census Bureau 2009).
14. U.S. Census Bureau, n.d. "American FactFinder: Ambler city" Accessed August 15, 2014. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

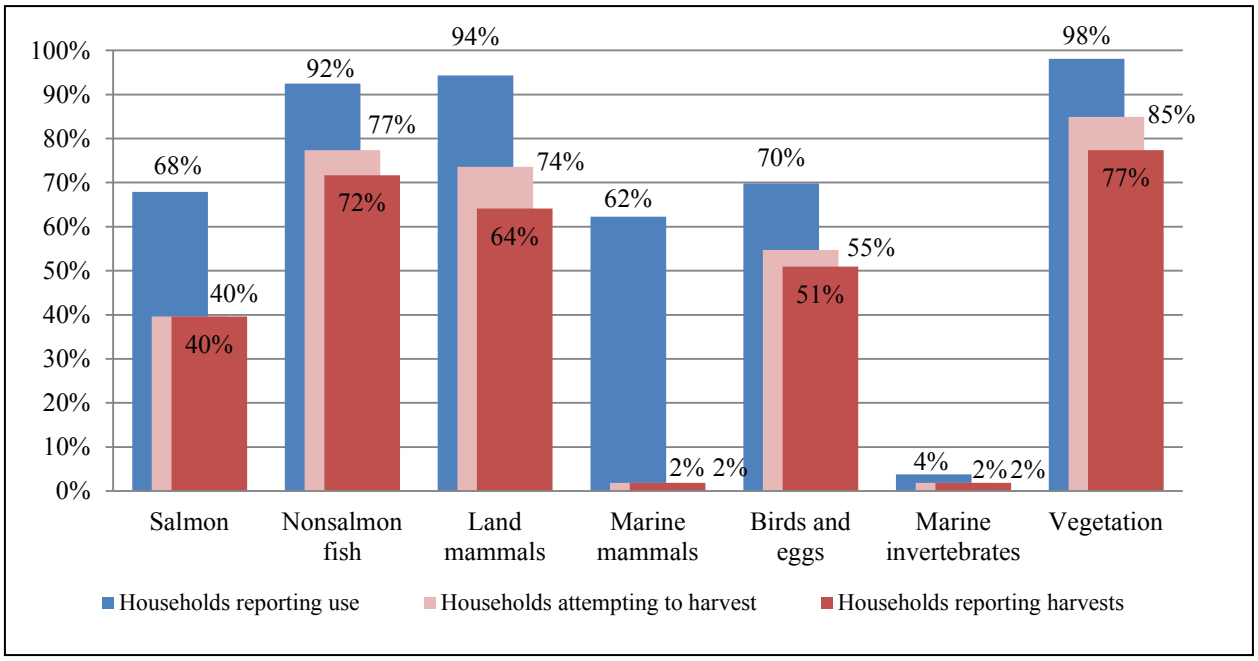

Figure 2-4.–Percentages of households using, attempting to harvest, and harvesting wild resources by category, Ambler, 2012.

worked in 9 months of the year. Only 41% reported working in all 12 months of the year, and the average number of weeks employed was 37. The majority of households (86%) had at least 1 member employed at some point during the year.

Information on the number of months or weeks in which residents reported working at a job gives a rough account of economic opportunity. Job schedules show a more nuanced picture of the local economy (Table D2-4). Slightly more than one-half of jobs held (54%) were full-time (35 hours or more a week). More than one-quarter of jobs held (28%) were "on-call," which means they were occasional jobs. In many rural communities these types of jobs are day work occurring a few times a month, such as calling bingo games, chopping wood for the tribal government, or performing other "as-needed" tasks. Part-time work (less than 35 hours per week) made up 7% of jobs held, and 10% of jobs were shift work.

The single largest source of "other income" came from Native corporation dividends (Table 2-2). In 2012, the NANA dividend was $7.72 per share[15]; in many households, members held several hundred shares. In addition to the common dividend, NANA distributed a special $2,000 dividend to elders aged 65 and older.[16] Together, these dividends came to more than $310,000 in Ambler, or 23% of other income. The next greatest contributors, food stamps and the Alaska PFD, were nearly equal: $233,527 and $215,292, respectively. Social Security payments were the last major source of other income, totaling $195,013, or 15% of the other income total value. These 4 sources together made up 71% of other income, $954,962.

Lesser sources of "other income" were a mix of programs and payments (in ranked order) such as pension/retirement, unemployment, energy assistance, Supplemental Security income, CITGO fuel voucher, disability payments, and other sources. Many households received a fuel voucher for heating oil distributed to low-income families in the United States by the CITGO-Venezuela Heating Oil Program, which has been in place since 2005.

15. NANA Regional Corporation, Inc. 2012. "NANA Regional Corporation, Inc. Announces Shareholder Dividend." Accessed August 18, 2014.
http://nana.com/regional/news-and-press/press-releases/nana-regional-corporation-inc-announces-2012-dividend/
16. NANA Regional Corporation, Inc. 2012. "NANA Elders' Settlement Trust Announces Distribution." Accessed August 18, 2014. http://nana.com/regional/news-and-press/press-releases/elders-settlement-trust-announces-distribution/

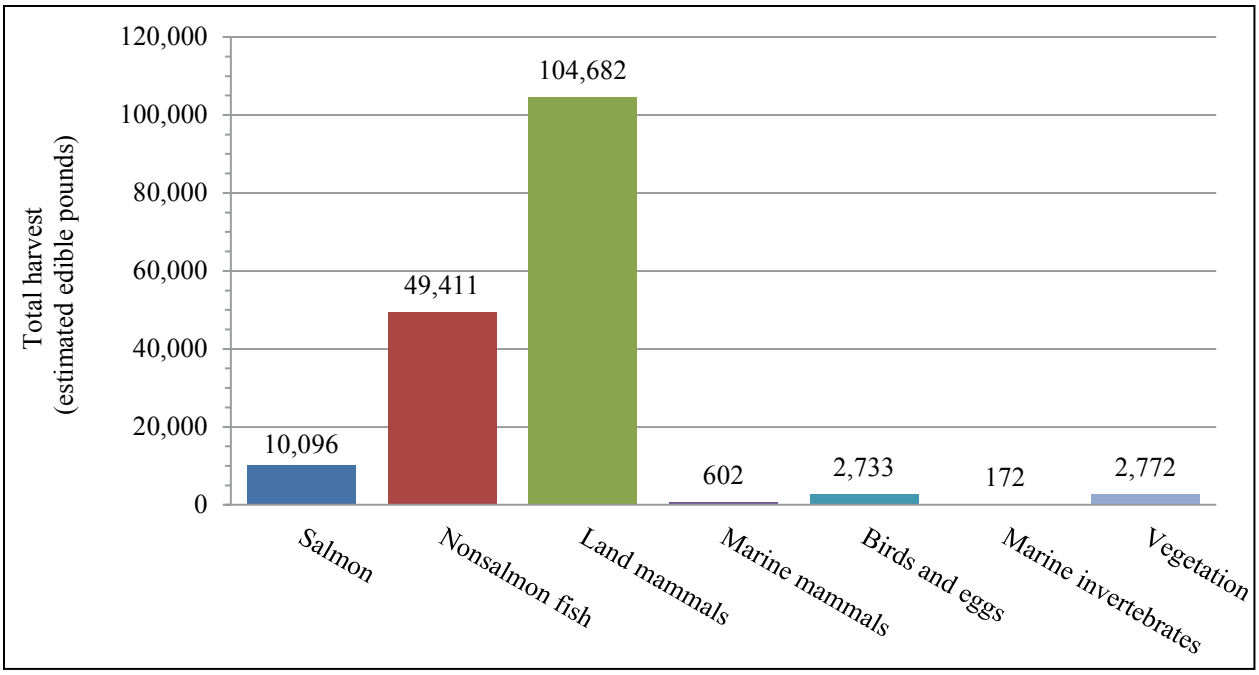

Figure 2-5.–Total harvest in estimated edible pounds, by resource category, Ambler, 2012.

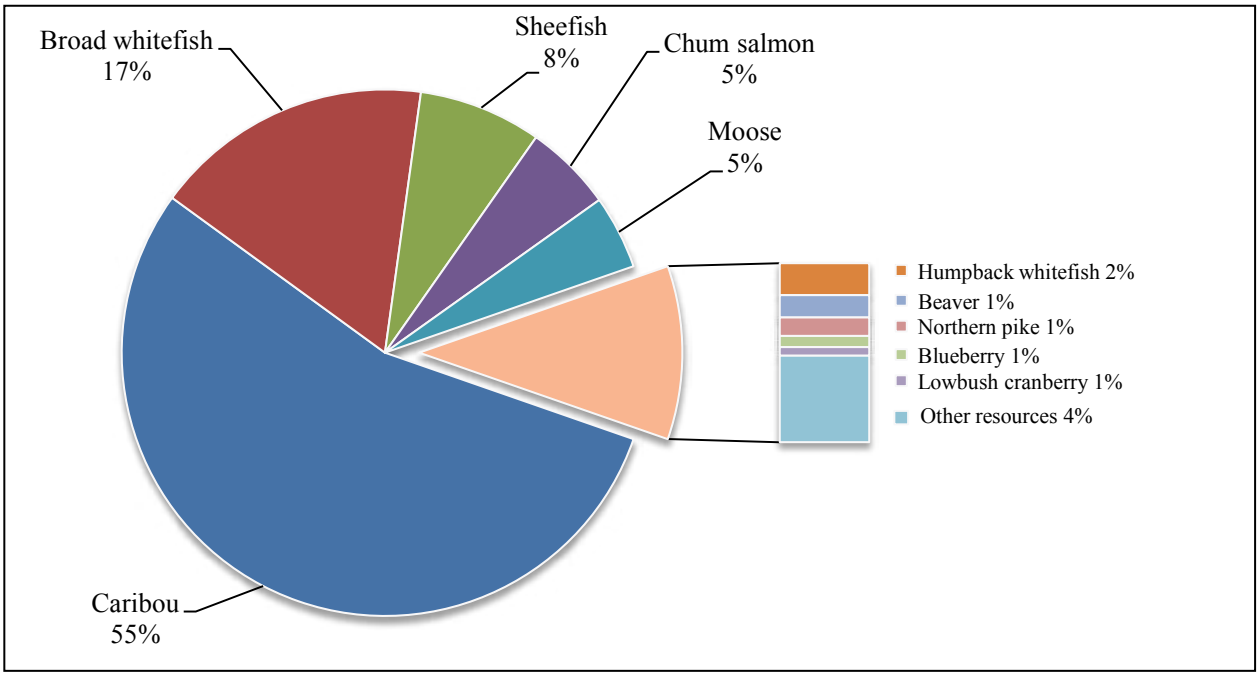

Figure 2-6.–Top 10 species harvested, ranked by estimated edible weight, Ambler, 2012.

Summary of Harvest and Use Patterns in 2012

Table D2-5 summarizes resource harvest and use characteristics for Ambler in 2012 at the household level. Nearly all households (98%) used wild resources in 2012, while 96% attempted to harvest or harvested any resource. The average harvest was 2,243 lb edible weight per household, or 603 lb per capita. During the study year, households harvested an average of 9 kinds of resources and used an average of 15 kinds of resources. The maximum number of resources used by any household was 41. In addition, households gave away an average of 6 kinds of resources, and 87% of households reported giving resources to other households.

Figure 2-4 shows, by resource category, the percentage of households that used, attempted to harvest, or harvested wild foods. The most commonly used categories of resources were vegetation (including berries and wild plants), land mammals, and nonsalmon fishes. These resources also had higher percentages of households attempting to harvest them and doing so. The difference between households harvesting a resource and households using it reflects the prevalence of sharing and barter in the community. For example, while only 40% of households harvested salmon, 68% used it. Although marine mammals are not available locally, a small percentage of households reported going elsewhere to participate in marine mammal hunting. The relatively high percentage of households reporting use of marine mammals is due to sharing, barter, and trade with households in communities that hunt marine mammals.

Resource Harvests and Uses by Category

The 53 surveyed households in Ambler harvested 118,351 lb of wild foods between February 2012 and January 2013 (known as the 2012 study year). Expanding for unsurveyed households, the community harvested an estimated 170,468 lb (± 31%) of wild foods (Figure 2-5). Land mammals, overall, were the largest contributor to Ambler's subsistence in terms of edible weight. Ambler households harvested an estimated 104,682 lb of caribou, moose, and other land mammals—61% of total harvest. The next highest contributor was nonsalmon fish species, primarily various whitefishes; these supplied 49,411 lb, or 29% of total harvest. Of the remaining 10% of the harvest, salmon contributed 6%, vegetation made up 2%, and all other categories provided 1% or less.

Resource Harvests and Uses by Species

Figure 2-6 shows the top 10 species harvested by Ambler households during the 2012 study year. Five species provided 90% of Ambler's subsistence harvest. Caribou figured prominently as the single largest contributor, constituting 55% of harvest (93,220 lb) (Figure 2-6; Table 2-4). Broad whitefish were the next largest portion (29,280 lb), followed by sheefish (12,875 lb), chum salmon (9,214 lb), and moose (7,715 lb) (Figure 2-6; Table 2-3; Table 2-4). The remainder of the top 10 species each contributed 2% of the total harvest or less. All other species combined were just 4% of harvest. Five of the top 10 species harvested in Ambler were fish, which demonstrates the importance of fish in general, and whitefishes in particular (broad and humpback whitefish, and sheefish), to the community.

Tables 2-3 through 2-8 report estimated wild resource harvests and uses by Ambler residents in the study year; each table represents a resource category broken down by species. All edible resources are reported in pounds edible weight (see Appendix C for conversion factors[17]). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources harvested, given away, or used by any member of a household, as well as resources acquired from other harvesters, either as gifts, by barter or trade, or through hunting partnerships. Differences between harvest and use percentages reflect sharing and barter among households, which results in a wider distribution of wild foods.

During the study period, the overall area used for wild food harvests by Ambler households totaled 406 square miles (Figure 2-7). It extended west along the Kobuk River drainage past Kavet Creek and to the east

17. Resources that are not eaten, such as firewood and some furbearers, are included in the table but are given a conversion factor of zero.

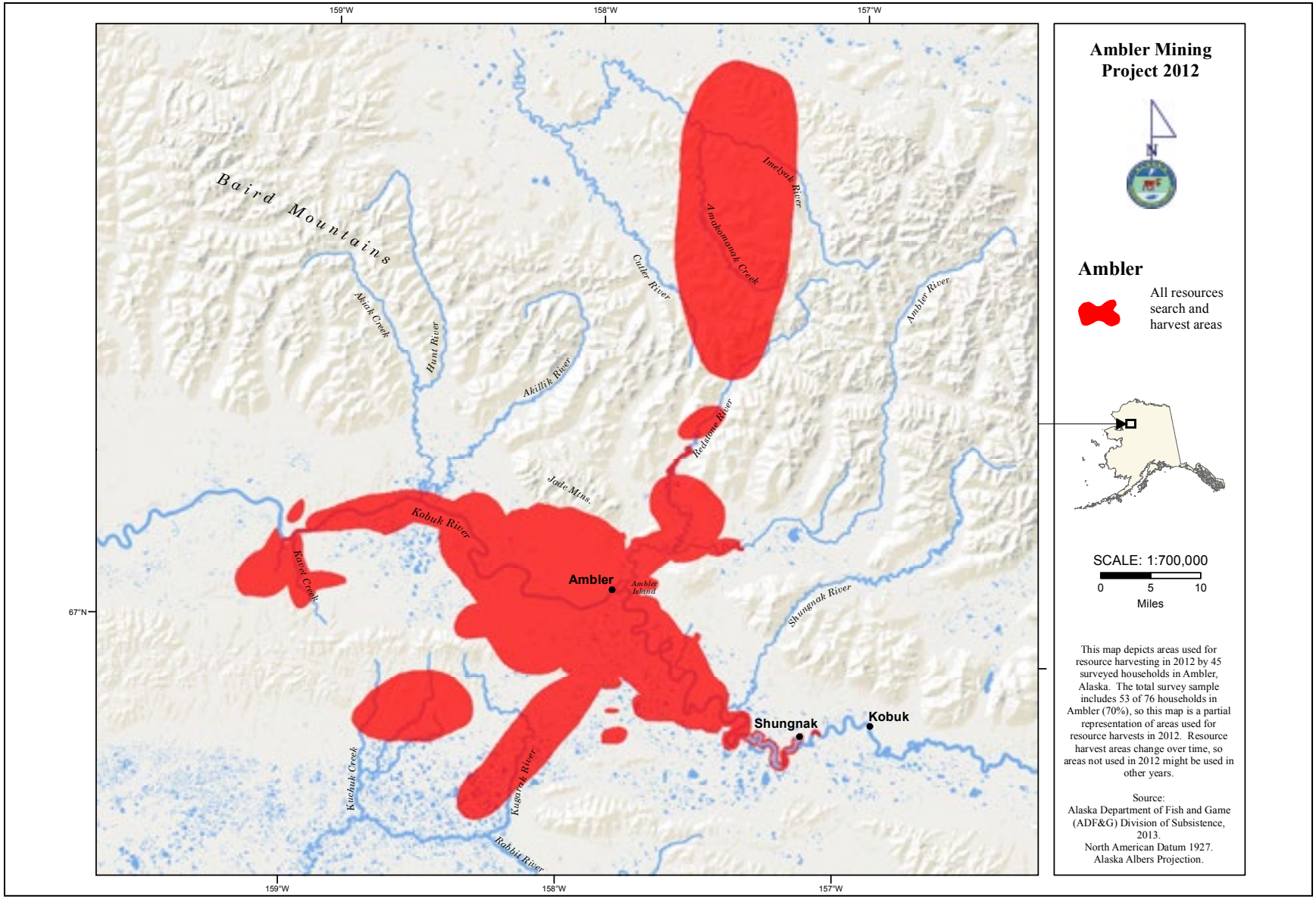

Figure 2-7.–All resources search and harvest areas, Ambler, 2012.

past Shungnak. The use area extended north into the upper Noatak River drainage, including the Imelyak River and Amakomanak Creek. In addition, overland use areas to the south and west of the community were mapped in the vicinity of the Kugarak River, Rabbit River, and Kuchuk Creek. The mainstem Kobuk, Ambler, and Redstone rivers figured prominently in subsistence activities, as will be described in resource category maps that follow.

Salmon

Ambler households harvested an estimated 10,096 lb of salmon in the study period, which made up 17% of the 59,507 edible pounds of fish harvested in total (Table 2-3). Chum salmon were the most commonly harvested and used species; this species contributed 33 lb of the 36 lb per capita salmon harvest. Lesser harvests of all other species of salmon totaled about 9% of the salmon harvest; these included sockeye salmon, some of which were harvested by households who fished outside of the region. A total of 416 chum salmon, 2,363 lb, were used to feed dogs (Table D2-6).

Nonsalmon Fish

Nonsalmon fish played a larger role in local diets than salmon species, contributing a total of 49,411 lb, nearly 5 times that of salmon (Table 2-3). On average, households harvested 650 lb of fish other than salmon, or 175 lb per capita. Nonsalmon fish constituted 83% of the total fish harvest by weight. Whitefish species were an overwhelming majority (92%) of the nonsalmon fish harvested. Three species—broad whitefish, humpback whitefish, and sheefish—predominated. Sheefish, the largest whitefish species, were the most commonly sought species; 62% of households attempted harvest, and 81% of households used them. However, far more broad whitefish were caught, 9,150 fish, providing 29,280 lb. Just over 2,000 whitefishes were used to feed dogs, along with a few northern pike (Table D2-6).

Harvests of other nonsalmon fish species were small in comparison to whitefishes: 1,874 lb of northern pike, 853 lb of Arctic grayling, and 614 lb of burbot (known as "mudshark" or *tittaaliq* locally). A small harvest of Pacific halibut took place by households fishing outside the region. A few households used fishes not present or harvested near Ambler, such as Pacific herring, smelt, and saffron cod (known locally as "tomcod"). Households likely obtained these through sharing or barter with other northwestern Alaska communities.

Fishing Gear and Harvest Locations

Subsistence gillnets were the primary gear type used for salmon harvests, accounting for 93% of all salmon harvested by weight (Figure 2-8). For chum salmon, 8,946 lb came from set gillnets, 204 lb were caught with rod and reel, and 65 lb were retained from commercial fishing (presumably at Kotzebue). Chum salmon were the only salmon species caught on rod and reel. A small quantity of pink salmon (21 lb of the 31 lb harvested) also came from commercial harvest retention. More sockeye salmon were harvested by "other subsistence methods" (413 lb) than by set gillnet (344 lb). In this case, "other method" refers to dip nets used in fisheries outside the region. No households reported using seines for salmon fishing. During surveys and interviews, Ambler residents remarked upon the unusual weather and its impact upon fishing. "We never go seining at all last summer. No eddy, everything was … high water. And too much rain" (ABL05021013). Another community member said:

> Breakup was fine, it was pretty normal in the amount of fish that was available as in the past … And then they start showing up and at first it was okay. We were getting a few salmon, and we could dry them and hang them and within … we were halfway through July, and then the rain started. And it was no more salmon. I mean they were there, but you could only catch an occasional 1, and most of the time you couldn't even have the net in the river because it was just trashed … Right, so nobody through July into half of August was … hardly anybody got any salmon, at least we didn't … Even if we could have gone elsewhere and fished, we couldn't have dried them anyway. (ABL02020713)

Table 2-3.–Estimated harvest and use of salmon and nonsalmon fish, Ambler, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Fish										
Salmon										
Chum salmon	66.0%	37.7%	37.7%	43.4%	26.4%	9,214.4 lb	121.2 lb	32.6 lb	1,621.4 ind	± 42%
Coho salmon	7.5%	5.7%	5.7%	3.8%	1.9%	74.1 lb	1.0 lb	0.3 lb	11.5 ind	± 75%
Chinook salmon	5.7%	1.9%	1.9%	3.8%	0.0%	19.0 lb	0.2 lb	0.1 lb	1.4 ind	± 110%
Pink salmon	3.8%	3.8%	3.8%	0.0%	1.9%	31.3 lb	0.4 lb	0.1 lb	8.6 ind	± 82%
Sockeye salmon	7.5%	1.9%	1.9%	5.7%	1.9%	757.1 lb	10.0 lb	2.7 lb	126.2 ind	± 110%
Unknown salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**67.9%**	**39.6%**	**39.6%**	**45.3%**	**28.3%**	**10,095.9 lb**	**132.8 lb**	**35.7 lb**	**1,769.1 ind**	**± 39%**
Char										
Dolly Varden	34.0%	18.9%	13.2%	24.5%	7.5%	279.2 lb	3.7 lb	1.0 lb	84.6 ind	± 45%
Lake trout	1.9%	1.9%	1.9%	0.0%	0.0%	11.5 lb	0.2 lb	0.0 lb	2.9 ind	± 110%
Subtotal	**34.0%**	**18.9%**	**13.2%**	**24.5%**	**7.5%**	**290.7 lb**	**3.8 lb**	**1.0 lb**	**87.5 ind**	**± 46%**
Whitefishes										
Sheefish	81.1%	62.3%	56.6%	50.9%	43.4%	12,875.3 lb	169.4 lb	45.6 lb	1,155.8 ind	± 26%
Broad whitefish	62.3%	35.8%	34.0%	41.5%	24.5%	29,280.4 lb	385.3 lb	103.7 lb	9,150.1 ind	± 50%
Bering cisco	1.9%	0.0%	0.0%	1.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Least cisco	3.8%	0.0%	0.0%	3.8%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Humpback whitefish	18.9%	11.3%	9.4%	13.2%	5.7%	3,243.2 lb	42.7 lb	11.5 lb	1,544.4 ind	± 70%
Round whitefish	3.8%	3.8%	3.8%	0.0%	1.9%	75.3 lb	1.0 lb	0.3 lb	107.5 ind	± 82%
Unknown whitefishes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**88.7%**	**69.8%**	**64.2%**	**62.3%**	**49.1%**	**45,474.2 lb**	**598.3 lb**	**161.0 lb**	**11,957.8 ind**	**± 44%**
Anadromous/marine fish										
Pacific herring	5.7%	1.9%	1.9%	5.7%	0.0%	0.5 lb	0.0 lb	0.0 lb	0.1 gal	± 110%
Smelt	1.9%	0.0%	0.0%	1.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Saffron cod	1.9%	0.0%	0.0%	1.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Pacific halibut	1.9%	1.9%	1.9%	0.0%	0.0%	304.0 lb	4.0 lb	1.1 lb	304.0 lb	± 110%
Subtotal	**11.3%**	**3.8%**	**3.8%**	**9.4%**	**0.0%**	**304.5 lb**	**4.0 lb**	**1.1 lb**		**± 110%**
Other freshwater fish										
Burbot	39.6%	24.5%	18.9%	22.6%	9.4%	614.3 lb	8.1 lb	2.2 lb	146.3 ind	± 40%
Arctic grayling	56.6%	37.7%	37.7%	30.2%	20.8%	853.1 lb	11.2 lb	3.0 lb	947.8 ind	± 33%
Northern pike	28.3%	20.8%	18.9%	13.2%	11.3%	1,873.9 lb	24.7 lb	6.6 lb	567.8 ind	± 84%
Subtotal	**71.7%**	**50.9%**	**49.1%**	**41.5%**	**34.0%**	**3,341.3 lb**	**44.0 lb**	**11.8 lb**	**1,662.0 ind**	**35%**
All fish	**92.5%**	**79.2%**	**73.6%**	**75.5%**	**58.5%**	**59,506.5 lb**	**783.0 lb**	**210.6 lb**		**± 37%**
All resources	**98.1%**	**96.2%**	**96.2%**	**92.5%**	**86.8%**	**170,467.9 lb**	**2,243.0 lb**	**603.4 lb**		**± 31%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

Another respondent said that fish runs were late in 2012, and the few salmon harvested were eaten fresh or immediately frozen because they could not be dried (ABL07021013).

Salmon fishing in 2012 largely occurred upstream of Ambler along the Ambler River and its tributary, the Redstone River (Figure 2-9). Households fished at several locations on the Kobuk River up a few bends from the community. Some residents also fished farther downstream near the confluence of Kavet Creek and the Kobuk River.

A wider variety of gear was used to take nonsalmon fish (Figure 2-8). For whitefishes, "other subsistence methods" and set gillnets produced the majority of the harvest in 2012 (39,038 lb, or 86% of the whitefishes harvest). In Ambler's case, "other subsistence methods" refers to under-ice nets (gillnets set under the ice.) A significant portion of broad whitefish, one of the most important species for Ambler, was harvested with this gear. Fishers harvested less broad whitefish with set gillnets, approximately 3,350 lb. Sheefish harvests, in contrast, were nearly equally divided between set gillnets and rod and reel gear; they were the only whitefish taken by rod and reel.

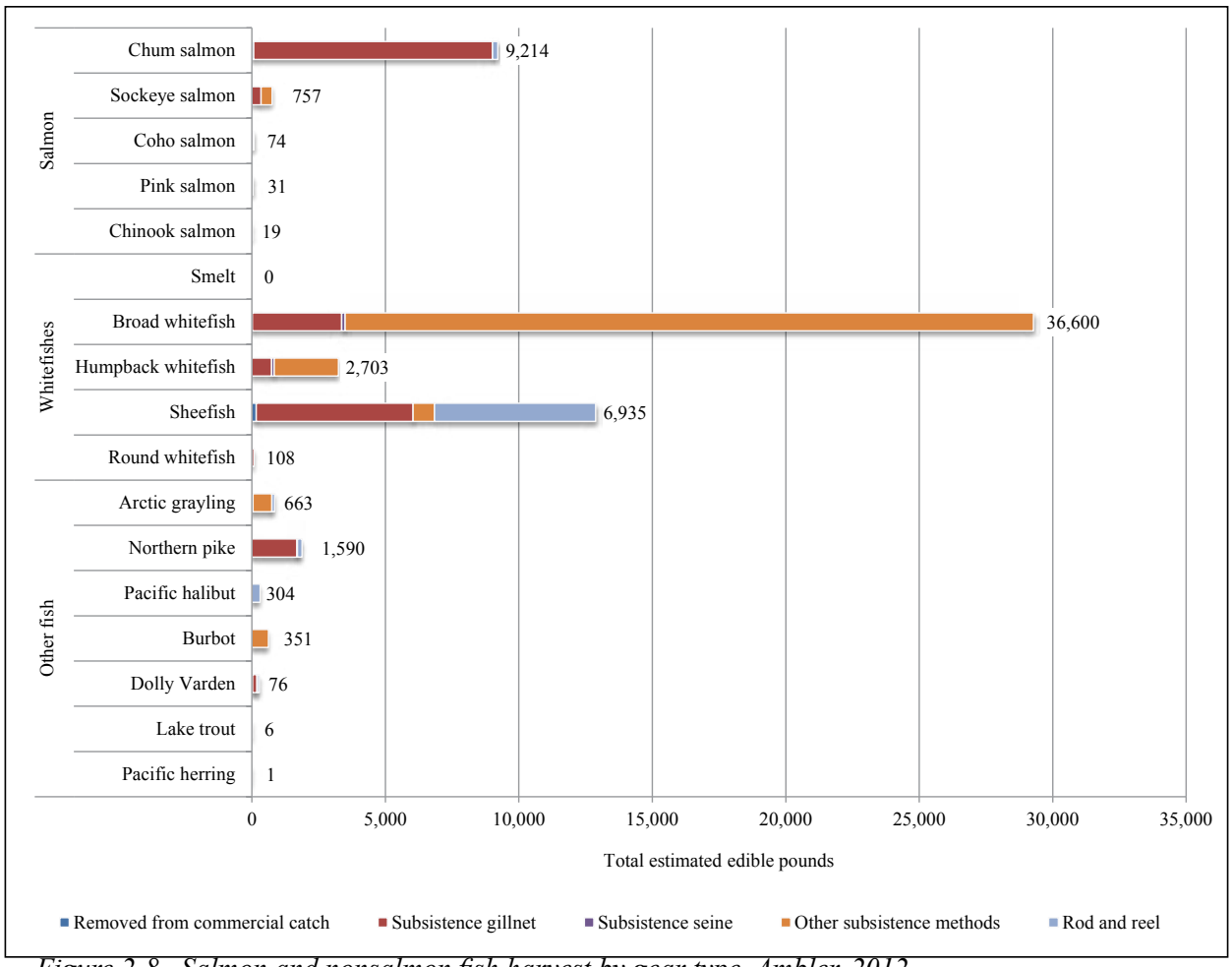

Figure 2-8.–Salmon and nonsalmon fish harvest by gear type, Ambler, 2012.

As was the case for salmon, few people seined for whitefishes.

> It was such high water, they didn't setnet and they didn't *qauqsaq* [seine]. Qauqsaq is seine. They didn't seine, nobody seine. There's usually 3 or 4 families and they have racks on the island and they'll do a sweep, 1 sweep, 2 sweeps, 3 sweeps, will get you 4 on each side of the, what they cut and smoke 2 racks full like this, usually every fall. They didn't do it this fall. The water was um, this higher [gesturing, indicating 3–4 feet] than normal. (ABL01021013)

Fishers took the bulk of northern pike harvested in set gillnets (90% or 1,689 lb) and a small amount by rod and reel (approximately 170 lb). Most Arctic grayling came from "other subsistence methods," in this case, jigging through the ice. Two "other subsistence methods" provided burbot: jigging and set lines.

Although sheefish are now considered a whitefish species within Western scientific taxonomy, local people do not consider them a whitefish. As a result, Figure 2-10 displays sheefish specifically, while all other whitefishes are combined in Figure 2-11.

Ambler has the good fortune of having an excellent location near town for seining and then, later, setting under-ice nets, referred to as the "Ambler Eddy," or Qasruunaq[18] (Anderson et al. 1977:732). This site is large enough to accommodate multiple nets; households may share responsibilities (and harvests) from a

18. Identified in Anderson et al. (1977:732) as Qasruniqruq, "a bend in the river and adjacent eddy."

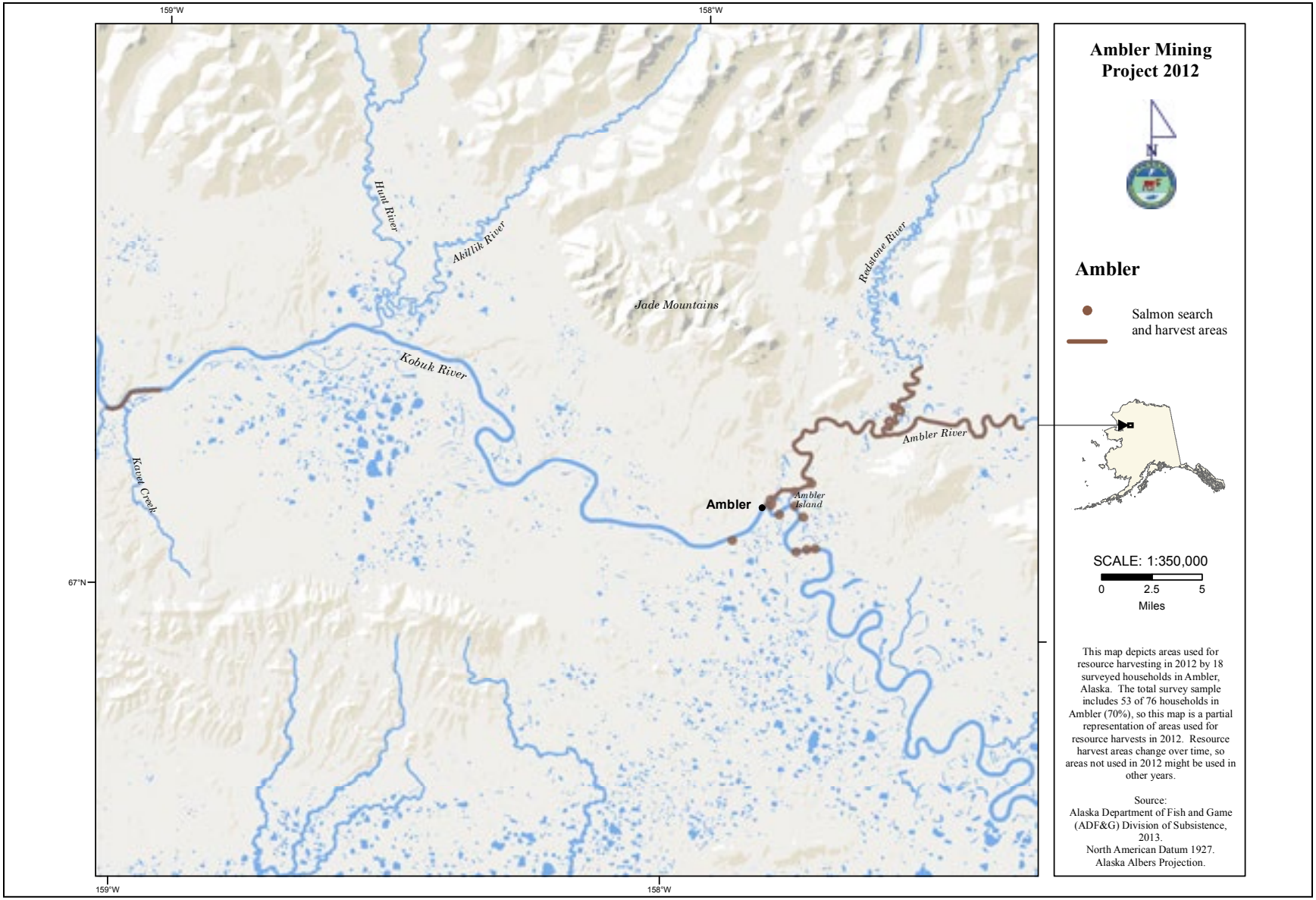

Figure 2-9.–Salmon search and harvest areas, Ambler, 2012.

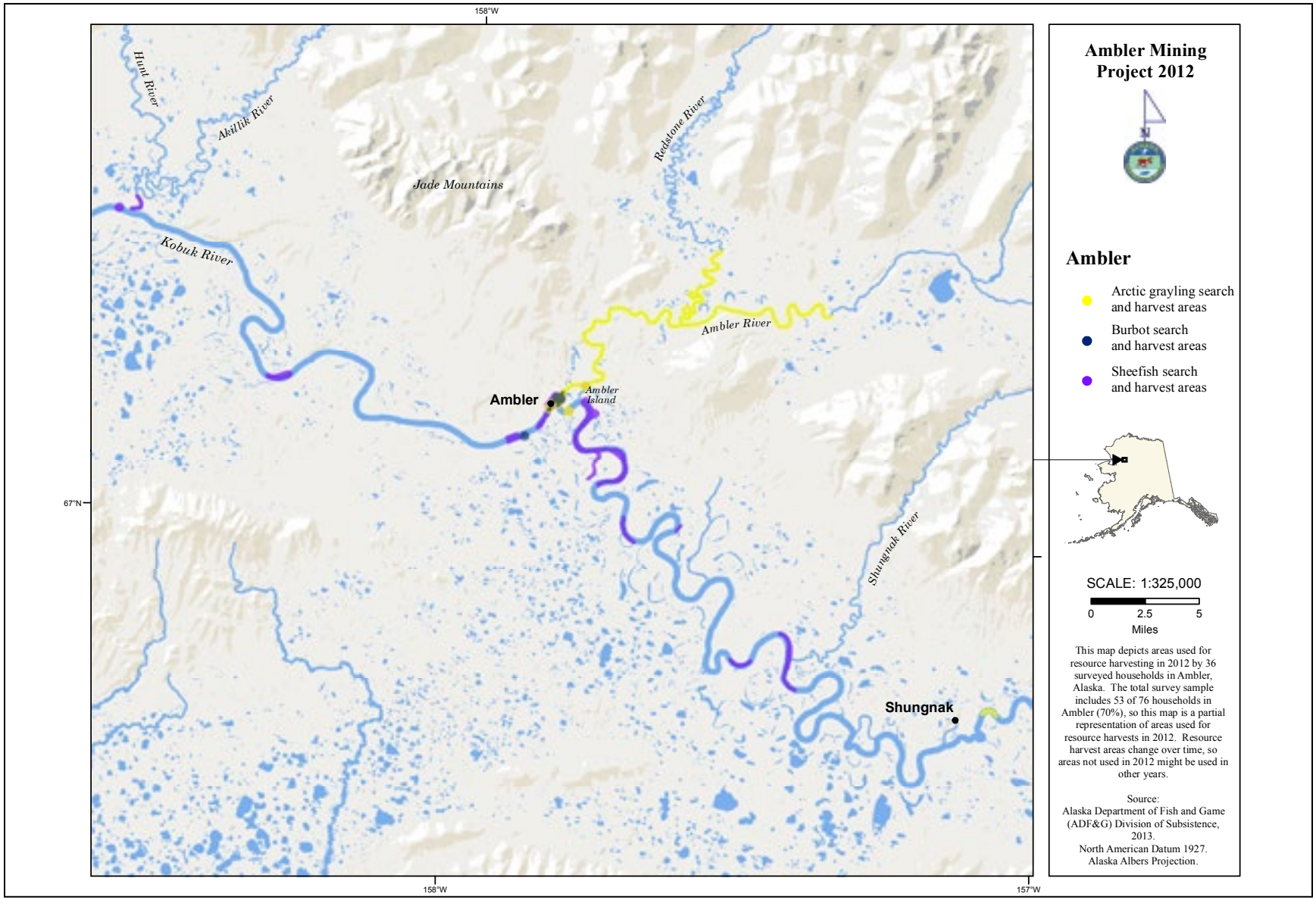

Figure 2-10.–Arctic grayling, burbot, and sheefish search and harvest areas, Ambler, 2012.

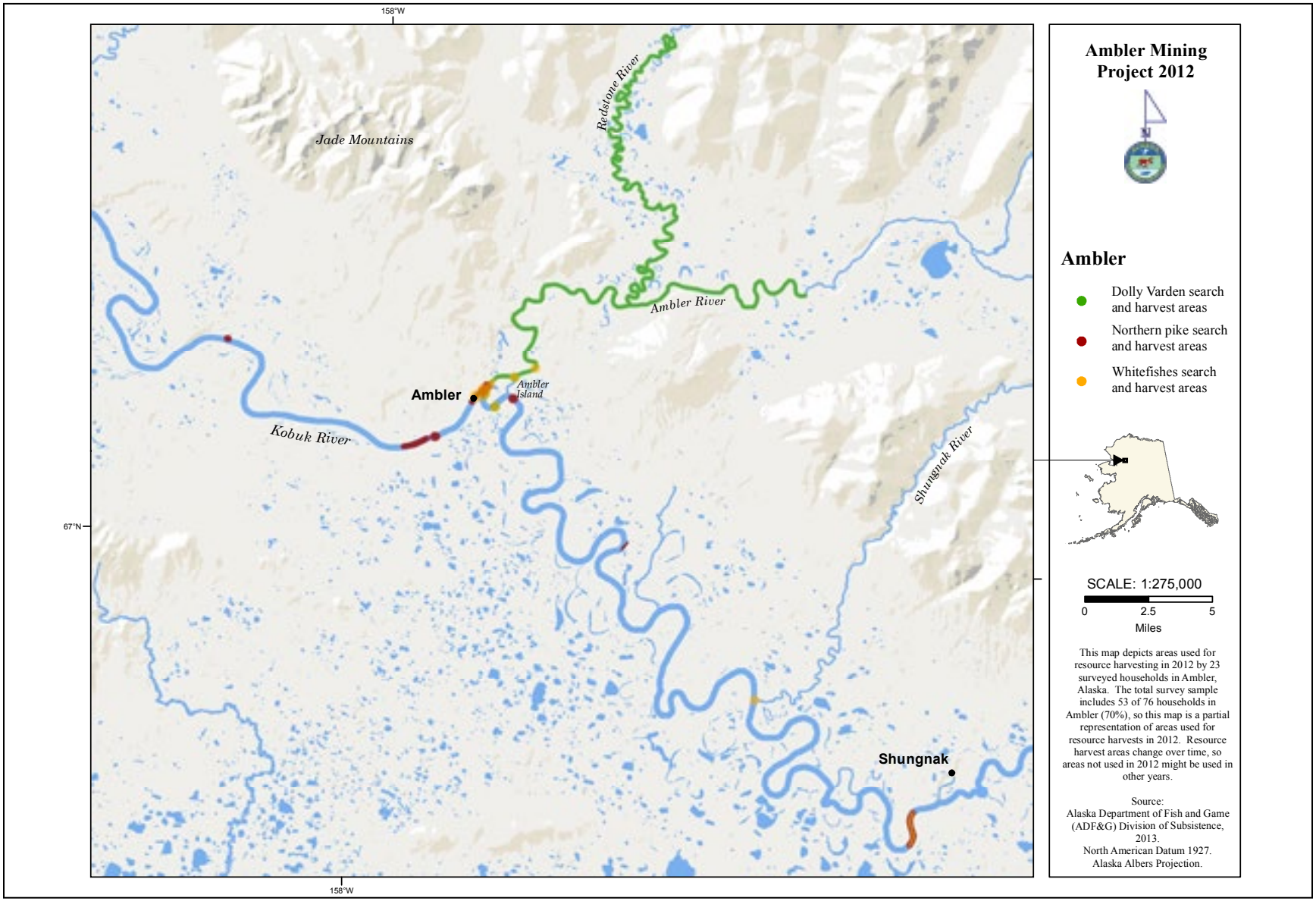

Figure 2-11.–Dolly Varden, northern pike, and whitefishes search and harvest areas, Ambler, 2012.

net. Several local residents described ongoing changes in the Ambler River, specifically at the eddy; these will be discussed in greater detail later in this chapter.

The ability to set under-ice nets near town proved valuable in 2012, because it allowed the community to make up for missing harvests during the earlier rainy (and high water) period. "At first we didn't think we would be able to do it, because there was no anchor for the ice that was being formed, since the water was high. But it ended up staying there and freezing into the shore, and it was okay after a while to get out there and do it" (ABL02020713).

Whitefish fishing locations in the study year were concentrated on the Ambler River at the Ambler Eddy (Figure 2-11); the study documented additional sites a few miles upriver. Other whitefish fishing sites on the Kobuk River included the confluence of the Ambler and Kobuk rivers, the mouth of the Shungnak River, and just below of the village of Shungnak. Fishing for sheefish occurred over a greater area along the Kobuk River; it ranged from the mouth of the Hunt River to approximately 1 mile past the mouth of the Shungnak River (Figure 2-10). Northern pike fishing sites largely coincided with sites for whitefishes, with the exception of a few areas downstream of Ambler on the Kobuk River. Burbot fishing occurred near the community, but those locations are obscured in the map. Although Dolly Varden was a minor part of the harvest, residents did fish for the species along extensive sections of the Ambler and Redstone rivers.

Large Land Mammals

Large land mammals constituted 98% of all land mammals harvested by weight—102,116 lb of 104,682 lb. The resource provided an average of 1,344 lb per household or 362 lb per capita, and most of that weight was caribou (Table 2-4). An estimated 685 caribou were harvested by Ambler hunters, providing 93,220 lb of wild food. This averages to 9 caribou per household or 2.4 caribou per capita. By weight, average household caribou harvests were 1,227 lbs and per capita harvests were 330 lb. Caribou was the most commonly used species across all categories; this study estimated that 91% of households used caribou. It was also the most highly shared resource; 64% of households gave away caribou, and 62% received it. In comparison, about one-half of households used moose, and 28% of households hunted them. The 14 moose harvested provided an additional 7,715 lb, or 27 lb per capita. Much higher percentages of households hunted for caribou and moose than for other big game species. Small harvests of black bear, Dall sheep, and brown bear rounded out local diets, but taken together they constituted only about 1% of large land mammal harvests.

Most caribou harvested were bulls (69%), a total of 476 animals. Of the remainder, 194 (28%) were cows, and 16 were of unknown sex (Table D2-7). Bull harvests were concentrated August–October, months when caribou usually migrate through the area. During this time, the bulls are in prime condition before going into rut. Local hunters prefer cows thereafter. Ambler residents harvested 158 cows in winter and spring months of the study period (February–May 2012 and November 2012–January 2013.) Hunters harvested 12 caribou of unknown sex in August and September and 4 in April.

Most moose, 10 of 14, were bulls harvested during fall months. One additional bull was harvested in November, and the single cow was harvested in April. Respondents could not remember the sex or harvest month of 1 moose.[19]

The survey did not ask for the sex of black bears or brown bears (Table D2-7). Hunters harvested all 9 black bears in September, and 1 brown bear in April.

Small Land Mammals/Furbearers

The subcategory "small land mammals" comprises both those used for food and those harvested for fur (Table 2-4). Beavers were the single largest contributor for food, with 116 animals providing 2,266 edible pounds, and they were also the most commonly used species of small land mammals. Snowshoe hares were the second largest contributors to the small mammal edible harvest (53 hares, 133 lb). Small harvests of river otters, lynx, muskrats, and porcupines provided variety in local diets. Households in Ambler reported

19. A reported harvest of 1 moose expands to an estimated 1.4.

Table 2-4.–Estimated harvest and use of land and marine mammals, Ambler, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Land mammals										
Large land mammals										
Black bear	26.4%	13.2%	9.4%	17.0%	11.3%	757.1 lb	10.0 lb	2.7 lb	8.6 ind	± 50%
Brown bear	7.5%	3.8%	3.8%	3.8%	5.7%	125.7 lb	1.7 lb	0.4 lb	1.5 ind	± 109%
Caribou	90.6%	69.8%	62.3%	61.5%	63.5%	93,220.3 lb	1,226.6 lb	330.0 lb	685.4 ind	± 23%
Moose	49.1%	28.3%	18.9%	34.0%	20.8%	7,714.7 lb	101.5 lb	27.3 lb	14.3 ind	± 32%
Common muskox	1.9%	0.0%	0.0%	1.9%	1.9%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Dall sheep	3.8%	1.9%	1.9%	1.9%	1.9%	298.3 lb	3.9 lb	1.1 lb	2.9 ind	± 110%
Subtotal	**94.3%**	**73.6%**	**64.2%**	**71.7%**	**64.2%**	**102,116.1 lb**	**1,343.6 lb**	**361.5 lb**	**712.7 ind**	**± 23%**
Small land mammals										
Beaver	28.3%	23.1%	22.6%	15.4%	15.4%	2,265.7 lb	30.4 lb	8.0 lb	115.5 ind	± 41%
Arctic fox	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*		0.0 lb	0.0 ind	± 0%
Red fox	3.8%	3.8%	3.8%	1.9%	0.0%	*Not usually eaten.*		0.0 lb	21.5 ind	± 79%
Alaska hare	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Snowshoe hare	15.1%	11.3%	9.4%	7.5%	9.4%	132.6 lb	1.7 lb	0.5 lb	53.1 ind	± 58%
North American river (land) otter	3.8%	3.8%	3.8%	0.0%	1.9%	0.0 lb	0.0 lb	0.0 lb	11.5 ind	± 97%
Lynx	5.7%	3.8%	3.8%	1.9%	3.8%	0.0 lb	0.0 lb	0.0 lb	8.6 ind	± 77%
Marmot	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Marten	9.4%	7.5%	7.5%	1.9%	1.9%	*Not usually eaten.*			47.3 ind	± 57%
Mink	1.9%	1.9%	1.9%	0.0%	0.0%	*Not usually eaten.*			1.4 ind	± 110%
Muskrat	9.4%	9.4%	9.4%	0.0%	3.8%	64.5 lb	0.8 lb	0.2 lb	35.8 ind	± 54%
Porcupine	9.4%	7.5%	7.5%	1.9%	5.7%	103.2 lb	1.4 lb	0.4 lb	12.9 ind	± 67%
Arctic ground (parka) squirrel	1.9%	0.0%	0.0%	1.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Least weasel	1.9%	1.9%	1.9%	0.0%	1.9%	*Not usually eaten.*			4.3 ind	± 110%
Gray wolf	15.1%	9.4%	9.4%	5.7%	1.9%	*Not usually eaten.*			20.1 ind	± 67%
Wolverine	13.2%	9.4%	9.4%	3.8%	3.8%	*Not usually eaten.*			17.2 ind	± 68%
Subtotal	**35.8%**	**32.1%**	**30.2%**	**20.8%**	**20.8%**	**2,566.1 lb**	**33.8 lb**	**9.1 lb**	**349.2 ind**	**± 38%**
Marine mammals										
Bearded seal	24.5%	1.9%	1.9%	22.6%	11.3%	602.3 lb	7.9 lb	2.1 lb	1.4 ind	± 110%
Ringed seal	3.8%	0.0%	0.0%	3.8%	1.9%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Spotted seal	3.8%	0.0%	0.0%	3.8%	1.9%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown seal	35.8%	0.0%	0.0%	35.8%	13.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Walrus	1.9%	0.0%	0.0%	1.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Beluga whale	22.6%	0.0%	0.0%	22.6%	7.5%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Bowhead whale	41.5%	0.0%	0.0%	41.5%	13.5%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**62.3%**	**1.9%**	**1.9%**	**60.4%**	**26.4%**	**602.3 lb**	**7.9 lb**	**2.1 lb**	**1.4 ind**	**± 110%**
All land mammals	**94.3%**	**73.6%**	**64.2%**	**77.4%**	**64.2%**	**104,682.1 lb**	**1,377.4 lb**	**370.6 lb**	**1,061.9 ind**	**± 26%**
All marine mammals	**62.3%**	**1.9%**	**1.9%**	**60.4%**	**26.4%**	**602.3 lb**	**7.9 lb**	**2.1 lb**	**1.4 ind**	**± 110%**
All resources	**98.1%**	**96.2%**	**96.2%**	**92.5%**	**86.8%**	**170,467.9 lb**	**2,243.0 lb**	**603.4 lb**		**± 31%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

hunting and trapping several furbearers, including 20 gray wolves, 17 wolverines, 22 red foxes, 47 marten, and 4 weasels, and 1 mink (Plate 2-4).

Trappers target wolves during months in which pelts will be in prime shape. In contrast, hunters often harvest wolves opportunistically in the winter while hunting by snowmachine. Residents harvested more than one-half of the wolves, 12, at the beginning of the study period in February and March 2012 (Table D2-8). Another 7 were harvested near its end in November and January.

Beaver harvests were heaviest in April through June, when 77% were harvested (Table D2-8). Snowshoe hare harvests occurred in February, ceased until winter began again in November, then continued through January 2013. Muskrat harvests began in April and continued through June. All animals harvested for fur were taken early in the study period from February to March. Harvests then ceased until late 2012–early

Nicole M. Braem

Plate 2-4.–Fox pelts harvested and home tanned in Ambler. Harvest of furbearing animals remains an important part of Ambler's subsistence pattern. Although fewer residents run traplines in the 21st century than in the past, fur is commonly used in making clothing and handicrafts. Inset: Hide scrapers are made with repurposed metal from old drainpipes, spark plug sockets, old shotgun barrels, etc. Carved handles are sized to fit comfortably for the repetitive work of scraping a hide.

2013. In general, overall household participation in small land mammal harvests and use was less than that for fish or large land mammals (Table 2-3; Table 2-4).

Land Mammal Hunting and Harvest Locations

Ambler's hunting areas for caribou were centered on the Kobuk and Ambler rivers, as well as a large swath of land immediately north and west of the community (Figure 2-12). This pattern of use reflects 2 types of access: boat and ATV. One key respondent noted that caribou were available on lands south and west of the community during the winter (ABL04021013). Hunters reached fall hunting areas by boat or ATV, and they used snowmachines to access winter hunting areas. Because local hunters operated in their traditional hunting areas, they were well aware of common caribou migration routes. They used camp sites that have been used by their community for decades.[20] Respondents described a series of trails and locations extending to the vicinity of Jade Creek that people access by ATV for the purpose of hunting caribou. Informal names include "first blind," "second blind," and "third blind." Families take advantage of the ability of ATVs to reach country that may be inaccessible by boat. ATVs also allow for short trips using less gas than traveling by boat to family camps downriver from Ambler. The use of ATVs has increased over time:

20. In the case of Onion Portage, for thousands of years.

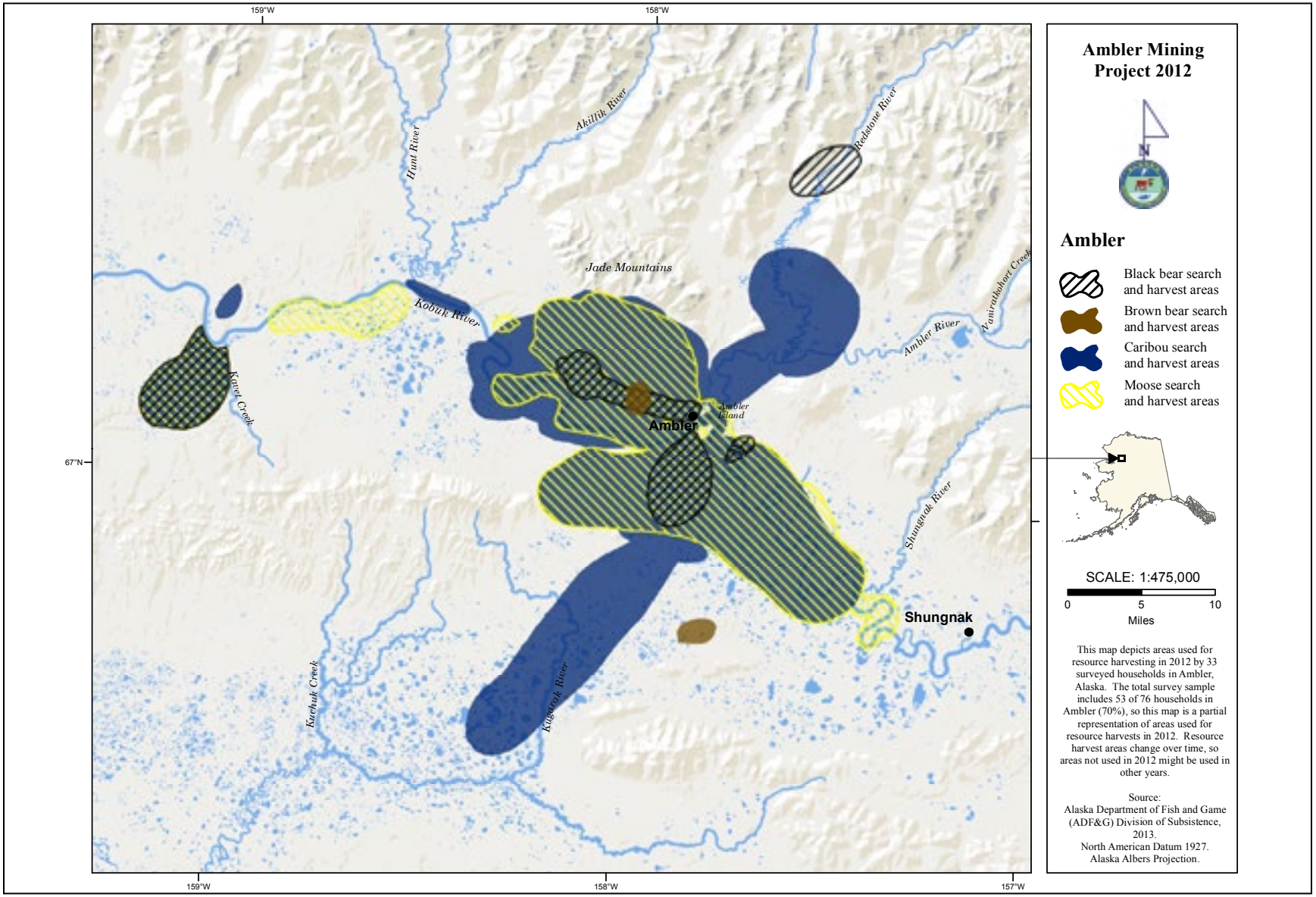

Figure 2-12.–Large land mammal search and harvest areas, Ambler, 2012.

> Well the boat, which takes 10 gallons a day. So, we'll take 4 or 5 people in the boat, and food and whatever, and if we can get 3 or 4 caribou, then it's a paying day. Um, I don't, you know. At that time it was $10 a gallon so if you're buying it locally at $11 a gallon and 10 gallons a day. The 4-wheeler, you're probably, you probably won't burn 3 gallons if you go a long ways. And then bring back the same amount of caribou. (ABL02020713; ABL07021013)

Major and generally consistent caribou migratory routes in the fall include the Hunt River and Akillik River drainages to the west, as well as areas around Kallurivik Creek, Naniratkohart Creek, and Ambler River to the east (ABL02020713; ABL01021013; ABL04021013)

Moose hunting areas in 2012 largely mirrored those used for caribou along the Kobuk River, but they extended further downstream past the Hunt River and farther upstream toward Shungnak. However, no households reported hunting moose on the Ambler or Redstone rivers. Smaller areas were used to hunt black bears, reflecting lower household participation in hunting for black bears than that seen for moose and caribou. Brown bear search areas were yet smaller; even fewer households hunted for that species. Two small areas used for hunting brown bears appear on the map: one area west of town and 1 directly south. The few households that hunted Dall sheep did not wish to describe their hunting areas.

Ambler residents hunted and trapped small land mammals in similar areas than they searched for large land mammals. These areas centered on the mainstem Kobuk River as well as the Ambler and Redstone rivers (Figure 2-13). These extended downriver of Ambler nearly to Kavet Creek and upriver to the vicinity of Pitkik Creek. Additionally, residents used an area west-southwest of Ambler in the Little Kobuk Sand Dunes as well as another area southwest of the community in the flats above Shaleruckik Mountain.

Marine Mammals

Marine mammal harvests are rare in upriver communities such as Ambler, but occasionally a stray animal will be present, or a household member may hunt with a relative in another community. Thus, estimated harvests of marine mammals for Ambler consisted of 1 bearded seal, which was harvested in June 2012 (Table 2-4; Table D2-9). However, sharing, barter, and trade results in fairly widespread use of marine mammals, and they are part of the subsistence patterns of Ambler. For example, 36% of households used seal oil, described as "unknown seal" in Table 2-4. Even more households reported use of bowhead whale, 42%, which likely came from the North Slope. (The only bowhead whaling community in the region, Kivalina, did not harvest a whale in 2012.) Use of beluga whale, ringed seal, spotted seal, and walrus also occurred. In nearly all cases, households that received marine mammals shared the resource with other households in the community. The survey did not ask for the sex of harvested marine mammals, and the location of the 1 bearded seal harvested could not be mapped because of its distance from Ambler.

In the past, bear fat and fish oil rendered locally played the role that seal oil does in coastal communities. Both are still used by Ambler households, but less commonly than before.

Marine Invertebrates

Harvests of marine invertebrates are even more uncommon than harvests of marine mammals. In the study year, a household harvested razor clams on the Kenai Peninsula, estimated at 57 gallons (±110%) (Table 2-5). Harvest locations of razor clams were not mapped. Additionally, 2% of households used king crab that they received from another coastal Alaska region.

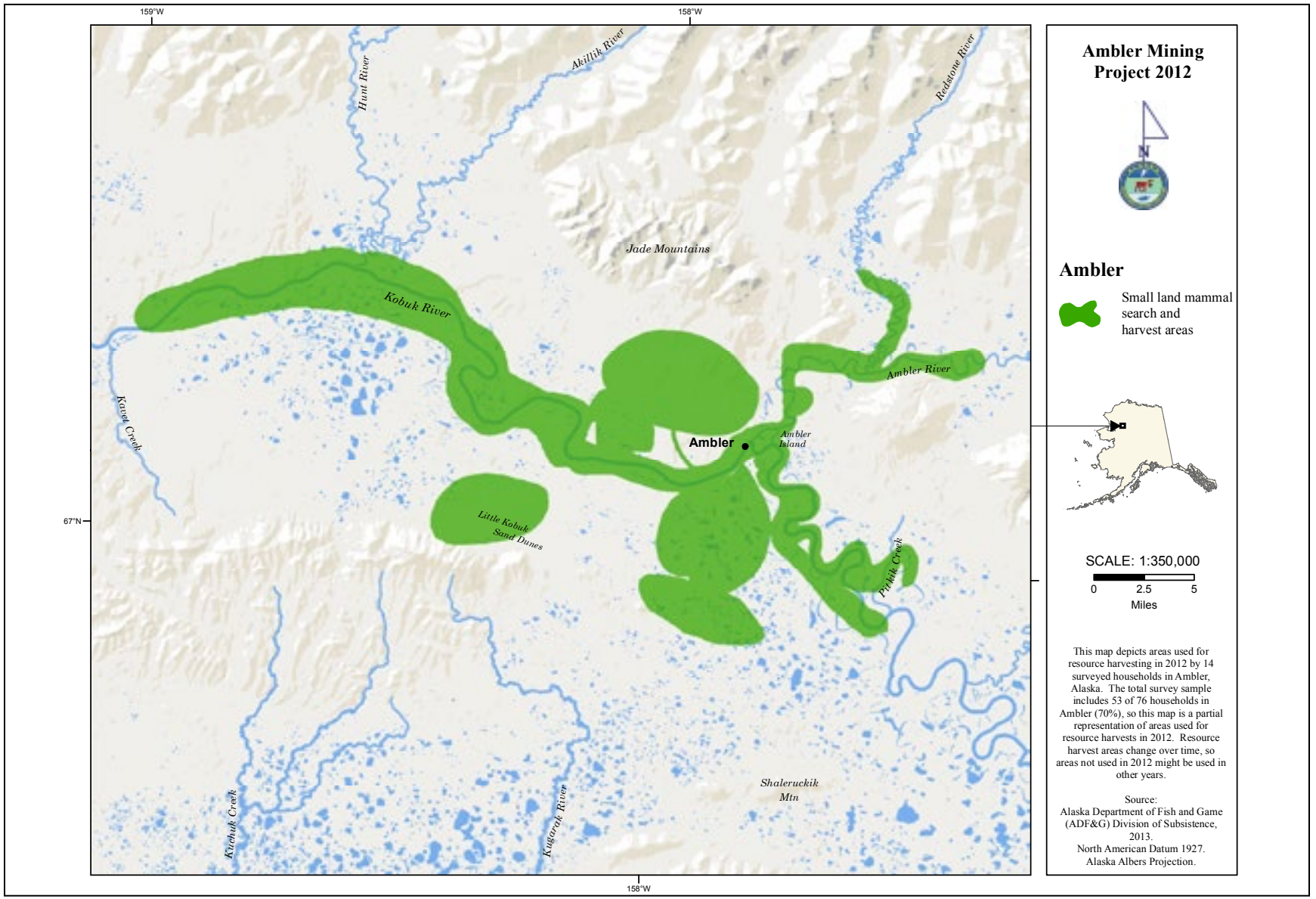

Figure 2-13.–Small land mammal search and harvest areas, Ambler, 2012.

Table 2-5.–Estimated harvest and use of marine invertebrates, Ambler, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Marine invertebrates										
Razor clams	1.9%	1.9%	1.9%	0.0%	1.9%	172.1 lb	2.3 lb	0.6 lb	57.4 gal	± 110%
Unknown clams	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
King crab	1.9%	0.0%	0.0%	1.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Mussels	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Shrimp	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Unknown marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Subtotal	**3.8%**	**1.9%**	**1.9%**	**1.9%**	**1.9%**	**172.1 lb**	**2.3 lb**	**0.6 lb**	**57.4**	**± 110%**
All marine invertebrates	**3.8%**	**1.9%**	**1.9%**	**1.9%**	**1.9%**	**172.1 lb**	**2.3 lb**	**0.6 lb**		**± 110%**
All resources	**98.1%**	**96.2%**	**96.2%**	**92.5%**	**86.8%**	**170,467.9 lb**	**2,243.0 lb**	**603.4 lb**		**± 31%**

Source ADF&G Division of Subsistence household surveys, 2013.
Note "All resources" include all species of fish, wildlife, and plants reported on the survey.
a. Amount of resource harvested is individual units, unless otherwise specified.

Birds and Eggs

Ambler households harvested an estimated 2,720 lb of birds during the study year, mostly consisting of migratory birds (2,242 lb) (Table 2-6). Bird harvests contribute less to local diets than other types of resources on an edible pounds basis, just 10 lb per capita. However, they provide variety and fresh meat in the spring before breakup. Because of their size, geese contributed the most edible pounds to the harvest; 390 geese provided 1,511 edible pounds, or 67% of migratory birds harvested by edible weight. Households reported harvests of 3 species of goose: white-fronted geese (known locally as "yellow feet" or "specklebellies"), Canada geese, and snow geese. Canada and white-fronted geese were the most commonly sought and used species. The estimated 207 white-fronted geese made up 58% of the goose harvest by weight, followed by 171 Canada geese and 13 snow geese.

More individual ducks were harvested than geese: 476 birds total provided 732 lb. Ambler households also harvested more species of ducks than geese. Of 13 species of duck harvested, 2 were most commonly harvested and used: mallards and northern pintails. Ambler hunters harvested 102 mallards and 85 northern pintails. Households also harvested ptarmigan and grouse; 55% of households used ptarmigan in the study period.

Hunting and harvest of migratory birds largely occurred during the spring, while most ptarmigan harvest (419 of 433 individuals) happened in winter months (Table D2-10). Lesser harvests occur during the summer because of difficult access and also by choice to leave birds alone while they are raising their young. A few black scoters and grouse were harvested in summer. The community harvested the bulk of grouse in the fall. During the fall hunt, fewer species were taken: mallards, northern pintails, surf scoters, wigeons, Canada geese, grouse, and ptarmigan.

Egg collecting was not a common pursuit: just 2% of households attempted to harvest them (Table 2-7). More shorebird eggs (37) were harvested than eggs of any other species, followed by goose eggs, and duck eggs. Because of their relative size, goose eggs were the greatest contributor in edible weight, 8 lb. Although no surveyed households reported harvesting gull eggs, they were received and used by 4% of households.

Ducks and geese search and harvest locations shown in Figure 2-14 include the south side of the Kobuk River downstream of Hunt River, the Ambler and Redstone rivers, as well as a large area bounding the Kobuk River from upstream of Akillik Creek nearly to the Shungnak River. This flats area, which appears as red crosshatch and grey in the map, extends away from the Kobuk River 5–10 miles in places, and

Table 2-6.–Estimated harvest and use of birds, Ambler, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Migratory birds										
Ducks										
Bufflehead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Canvasback	1.9%	1.9%	1.9%	0.0%	1.9%	2.9 lb	0.0 lb	0.0 lb	1.4 ind	± 110%
Common eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Goldeneye	3.8%	3.8%	3.8%	0.0%	1.9%	26.5 lb	0.3 lb	0.1 lb	17.2 ind	± 93%
Harlequin duck	1.9%	1.9%	1.9%	0.0%	1.9%	7.2 lb	0.1 lb	0.0 lb	7.2 ind	± 110%
Mallard	26.4%	17.0%	17.0%	11.3%	11.3%	198.5 lb	2.6 lb	0.7 lb	101.8 ind	± 46%
Long-tailed duck	7.5%	9.4%	7.5%	0.0%	5.7%	90.3 lb	1.2 lb	0.3 lb	67.4 ind	± 62%
Northern pintail	22.6%	15.1%	15.1%	11.3%	11.3%	132.0 lb	1.7 lb	0.5 lb	84.6 ind	± 60%
Scaup	1.9%	1.9%	1.9%	0.0%	1.9%	36.1 lb	0.5 lb	0.1 lb	21.5 ind	± 110%
Black scoter	13.2%	9.4%	7.5%	5.7%	7.5%	85.8 lb	1.1 lb	0.3 lb	48.8 ind	± 72%
Surf scoter	5.7%	5.7%	5.7%	0.0%	3.8%	38.5 lb	0.5 lb	0.1 lb	24.4 ind	± 73%
White-winged scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Northern shoveler	3.8%	3.8%	3.8%	0.0%	3.8%	23.4 lb	0.3 lb	0.1 lb	21.5 ind	± 82%
Green-winged teal	5.7%	3.8%	3.8%	1.9%	3.8%	10.4 lb	0.1 lb	0.0 lb	20.1 ind	± 96%
Wigeon	13.2%	9.4%	9.4%	5.7%	7.5%	71.4 lb	0.9 lb	0.3 lb	54.5 ind	± 65%
Unknown ducks	7.5%	1.9%	1.9%	5.7%	0.0%	8.6 lb	0.1 lb	0.0 lb	5.7 ind	± 110%
Subtotal	**47.2%**	**26.4%**	**26.4%**	**24.5%**	**15.1%**	**731.7 lb**	**9.6 lb**	**2.6 lb**	**476.1 ind**	**± 54%**
Geese										
Brant	3.8%	1.9%	0.0%	3.8%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Canada/cackling goose	47.2%	34.0%	32.1%	22.6%	20.8%	583.6 lb	7.7 lb	2.1 lb	170.6 ind	± 27%
Emperor goose	0.0%	1.9%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Snow goose	9.4%	9.4%	7.5%	1.9%	1.9%	51.6 lb	0.7 lb	0.2 lb	12.9 ind	± 62%
White-fronted goose	35.8%	28.3%	24.5%	13.2%	18.9%	875.5 lb	11.5 lb	3.1 lb	206.5 ind	± 33%
Unknown geese	0.0%	1.9%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**52.8%**	**39.6%**	**34.0%**	**28.3%**	**22.6%**	**1,510.7 lb**	**19.9 lb**	**5.3 lb**	**390.0 ind**	**± 28%**
Other migratory birds										
Tundra (whistling) swan	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Sandhill crane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown shorebirds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown loon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown seabirds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0%**
Other birds										
Grouse	17.0%	13.2%	13.2%	3.8%	9.4%	44.2 lb	0.6 lb	0.2 lb	63.1 ind	± 49%
Ptarmigan	54.7%	39.6%	37.7%	26.4%	28.3%	433.1 lb	5.7 lb	1.5 lb	433.1 ind	± 27%
Subtotal	**54.7%**	**39.6%**	**37.7%**	**26.4%**	**28.3%**	**477.2 lb**	**6.3 lb**	**1.7 lb**	**496.2 ind**	**± 28%**
All migratory birds	**58.5%**	**39.6%**	**37.7%**	**30.2%**	**22.6%**	**2,242.4 lb**	**29.5 lb**	**7.9 lb**	**866.1 ind**	**± 40%**
All other birds	**54.7%**	**39.6%**	**37.7%**	**26.4%**	**28.3%**	**477.2 lb**	**6.3 lb**	**1.7 lb**	**496.2 ind**	**± 28%**
All resources	**98.1%**	**96.2%**	**96.2%**	**92.5%**	**86.8%**	**170,467.9 lb**	**2,243.0 lb**	**603.4 lb**		**± 31%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

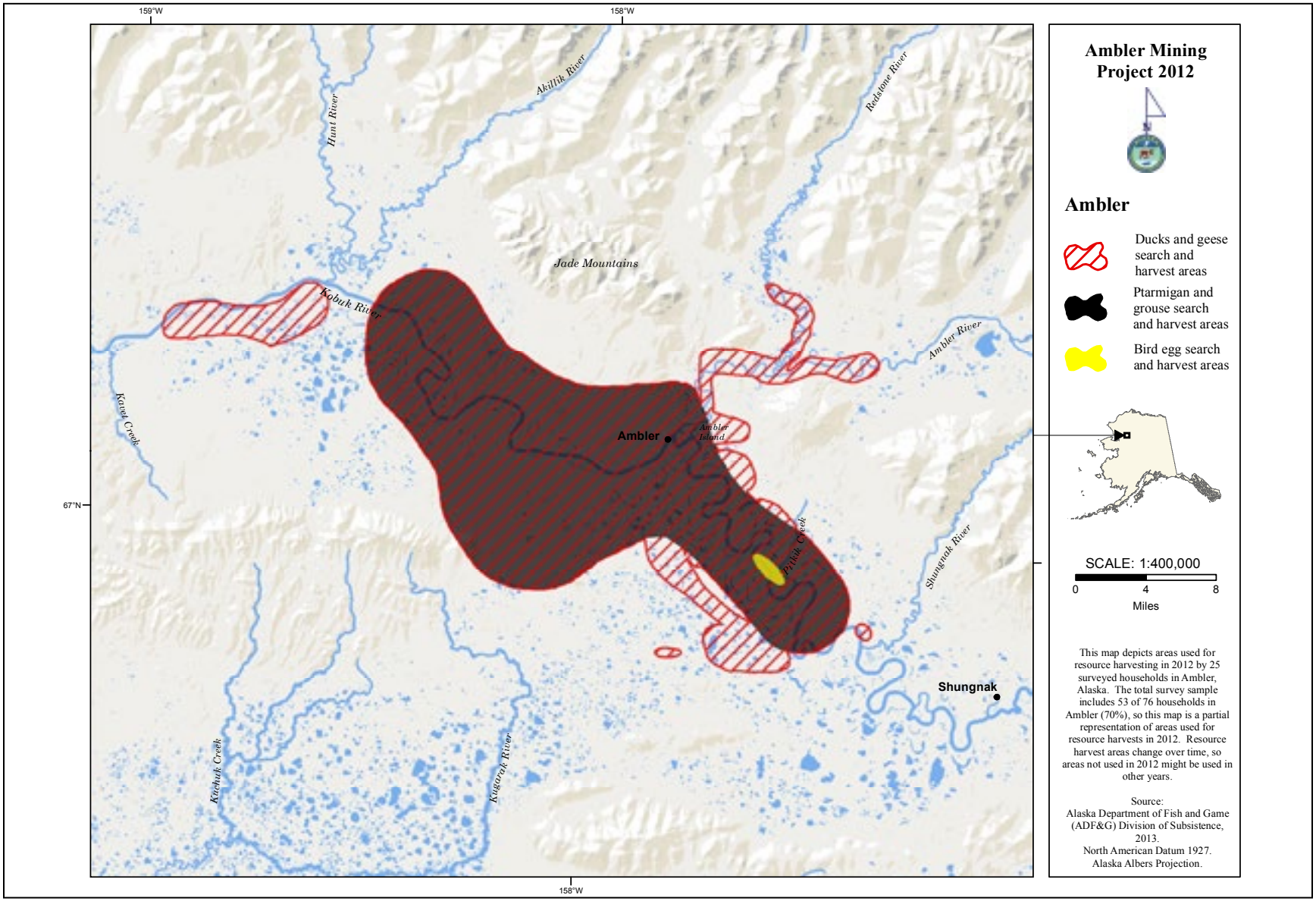

Figure 2-14.–Ducks, geese, ptarmigan, grouse, and bird eggs search and harvest areas, Ambler, 2012.

Table 2-7.–Estimated harvest and use of bird eggs, Ambler, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Bird eggs										
Duck eggs	1.9%	1.9%	1.9%	0.0%	0.0%	1.7 lb	0.0 lb	0.0 lb	11.5 ind	± 110%
Goose eggs	1.9%	1.9%	1.9%	0.0%	0.0%	7.7 lb	0.1 lb	0.0 lb	28.7 ind	± 110%
Swan eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Shorebird eggs	3.8%	3.8%	3.8%	0.0%	0.0%	3.9 lb	0.1 lb	0.0 lb	37.3 ind	± 110%
Gull eggs	3.8%	0.0%	0.0%	3.8%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**5.7%**	**1.9%**	**1.9%**	**3.8%**	**0.0%**	**13.3 lb**	**0.2 lb**	**0.0 lb**	**77.4 ind**	**± 110%**
All birds and eggs	**69.8%**	**54.7%**	**50.9%**	**37.7%**	**35.8%**	**2,733.0 lb**	**36.0 lb**	**9.7 lb**	**1,439.7 ind**	**± 32%**
All resources	**98.1%**	**96.2%**	**96.2%**	**92.5%**	**86.8%**	**170,467.9 lb**	**2,243.0 lb**	**603.4 lb**		**± 31%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

features many little sloughs and lakes. This area was also used for ptarmigan and grouse hunting. Egg collecting occurred in an area along the Kobuk River near Pitkik Creek.

Vegetation

Various types of wild plants and berries not only add variety to the subsistence diet, but are also important sources of vitamins A, C, D, and E (Egeland et al. 1998; Jones 2010). In the study year, Ambler residents harvested an estimated 2,772 lb of vegetation, or 10 lb per capita (Table 2-8). Berries were a significant part of this harvest (2,384 lb). Three berries predominated in harvest and use: blueberries (283 gal), lowbush cranberries (190 gal), and salmonberries (71 gal). Smaller harvests of raspberrries, crowberries, and highbush cranberries also occurred, with a total estimated berry harvest of 596 gal. Households harvested a few gallons of bearberries, *tinnich*, which are considered a delicacy. Household participation in berry picking was the highest of all subsistence resources, with 79% of households taking part. Berries were the most commonly used of all subsistence resource categories.

Wild plant harvests were diverse; households reported use of 10 different species. Ambler households picked Hudson's Bay tea, a fragrant addition to store-bought black tea, in the greatest quantity (116 gal); followed by wild rhubarb (*qusrimaq*) (49 gal); and wild celery (*ikuusiq*) (43 gal). Respondents also reported smaller harvests of Eskimo potato (*masru*), sourdock (*quagaq*), wild rose hips, stinkweed, and puffballs. Plant harvest and use was a more specialized activity than berry-picking; 23% of households harvested and 26% used these resources.

Although the survey form asked about harvests of firewood, respondents had a difficult time quantifying their annual harvests. Many households that harvested firewood did so throughout the year as it was needed by taking logs of varying length and diameter. This made calculating cord values extremely difficult and frustrating to respondents and surveyors—and increased the likelihood of vast inaccuracies in estimates. Thus, Table 2-8 does not include estimates of firewood harvests, "other wood." Black spruce, white spruce, and birch are present in the upper Kobuk River region and around Ambler. These serve as an additional fuel source in a location where heating oil cost $10.75 per gal in 2012—more than double the price in Fairbanks.[21] More than one-half of households (57%) used firewood in the study period. A few households harvested bark and roots for use in crafts.

21. In March 2012, Fairbanks residents paid approximately $4.34 per gal for stove oil. (University of Alaska Fairbanks, Cooperative Extension Service, Fairbanks, 2012. "Cooperative Extension Food Cost Survey." Accessed October 7, 2014. www.uaf.edu/files/ces/fcs/2012q1data.pdf)

Table 2-8.–Estimated harvest and use of vegetation, Ambler, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Berries										
Blueberry	88.7%	77.4%	75.5%	32.1%	35.8%	1,132.1 lb	14.9 lb	4.0 lb	283.0 gal	± 20%
Lowbush cranberry	58.5%	54.7%	52.8%	17.0%	26.4%	758.9 lb	10.0 lb	2.7 lb	189.7 gal	± 23%
Highbush cranberry	7.5%	7.5%	7.5%	0.0%	0.0%	14.7 lb	0.2 lb	0.1 lb	3.7 gal	± 63%
Crowberry	28.3%	26.4%	24.5%	3.8%	3.8%	43.0 lb	0.6 lb	0.2 lb	10.7 gal	± 50%
Raspberry	9.4%	7.5%	7.5%	1.9%	1.9%	134.8 lb	1.8 lb	0.5 lb	33.7 gal	± 94%
Salmonberry	45.3%	37.7%	34.0%	15.1%	13.2%	285.7 lb	3.8 lb	1.0 lb	71.4 gal	± 39%
Other wild berry	9.4%	11.3%	9.4%	0.0%	3.8%	15.0 lb	0.2 lb	0.1 lb	3.8 gal	± 60%
Subtotal	**90.6%**	**79.2%**	**77.4%**	**37.7%**	**41.5%**	**2,384.2 lb**	**31.4 lb**	**8.4 lb**	**596.1 gal**	± 19%
Plants/greens/mushrooms										
Wild rhubarb	3.8%	5.7%	3.8%	0.0%	0.0%	195.0 lb	2.6 lb	0.7 lb	48.8 gal	± 98%
Eskimo potato	5.7%	7.5%	5.7%	1.9%	0.0%	10.0 lb	0.1 lb	0.0 lb	2.5 gal	± 71%
Hudson's Bay (Labrador) tea	5.7%	5.7%	5.7%	0.0%	0.0%	116.3 lb	1.5 lb	0.4 lb	116.3 gal	± 109%
Sourdock	7.5%	7.5%	5.7%	1.9%	3.8%	12.2 lb	0.2 lb	0.0 lb	12.2 gal	± 75%
Willow leaves	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Wild celery	1.9%	1.9%	1.9%	0.0%	1.9%	43.0 lb	0.6 lb	0.2 lb	43.0 gal	± 110%
Wild rose hips	1.9%	1.9%	1.9%	0.0%	0.0%	0.7 lb	0.0 lb	0.0 lb	0.2 gal	± 110%
Other wild greens	3.8%	3.8%	1.9%	1.9%	1.9%	3.2 lb	0.0 lb	0.0 lb	3.2 gal	± 110%
Unknown mushrooms	1.9%	0.0%	0.0%	1.9%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Stinkweed	5.7%	7.5%	5.7%	1.9%	3.8%	5.7 lb	0.1 lb	0.0 lb	5.7 gal	± 67%
Puffballs	1.9%	1.9%	1.9%	0.0%	0.0%	1.4 lb	0.0 lb	0.0 lb	1.4 gal	± 110%
Unknown greens from land	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Subtotal	**26.4%**	**24.5%**	**22.6%**	**7.5%**	**9.4%**	**387.7 lb**	**5.1 lb**	**1.4 lb**	**233.4 gal**	± 63%
Wood										
Bark	1.9%	1.9%	1.9%	0.0%	0.0%	*Primarily used in crafts and/or as firewood.*				
Roots	1.9%	1.9%	1.9%	0.0%	0.0%	*Primarily used in crafts and/or as firewood.*				
Other wood	56.6%	37.7%	37.7%	26.4%	20.8%	*Primarily used as firewood.*				
Subtotal	**56.6%**	**37.7%**	**37.7%**	**26.4%**	**20.8%**	***Primarily used in crafts and/or as firewood.***				
All vegetation	**98.1%**	**84.9%**	**84.9%**	**50.9%**	**50.9%**	**2,771.9 lb**	**36.5 lb**	**9.8 lb**	**829.4 gal**	**± 23%**
All resources	**98.1%**	**96.2%**	**96.2%**	**92.5%**	**86.8%**	**170,467.9 lb**	**2,243.0 lb**	**603.4 lb**		**± 31%**

Source ADF&G Division of Subsistence household surveys, 2013.
Note "All resources" include all species of fish, wildlife, and plants reported on the survey.
a. Amount of resource harvested is individual units, unless otherwise specified.

Berry picking and plant gathering locations largely mirror those already described for other resource categories (Figure 2-15). Berry picking occurs in late summer and fall when households are actively engaged in other subsistence activities, such as caribou hunting, bear hunting, and fishing. Berry and plant harvest locations are therefore very widespread. The study documented harvest locations around Kavet Creek, the mouth of Hunt River, Onion Portage, a large area north and west of the community, the Ambler and Redstone rivers, as well as a long corridor on the Kobuk River from Onion Portage to Shungnak.

Harvest Assessments

The survey asked respondents to assess their household's harvests in 2 ways. The first question asked whether respondents used less, the same amount, or more of 7 resource categories in the study year as in recent years. The second asked whether they got "enough" of each of those categories. The survey also asked each household to assess its overall use of subsistence resources in the same manner. "Recent years" was defined as about the last 5 years. If a household reported a change in use (through a "less" or "more" response), the respondent was asked why. When households said they did not get enough of a resource category, they were asked a series of follow-up questions to determine what species was needed, why the household did not get enough, the severity of the impact to the household, and whether the household did

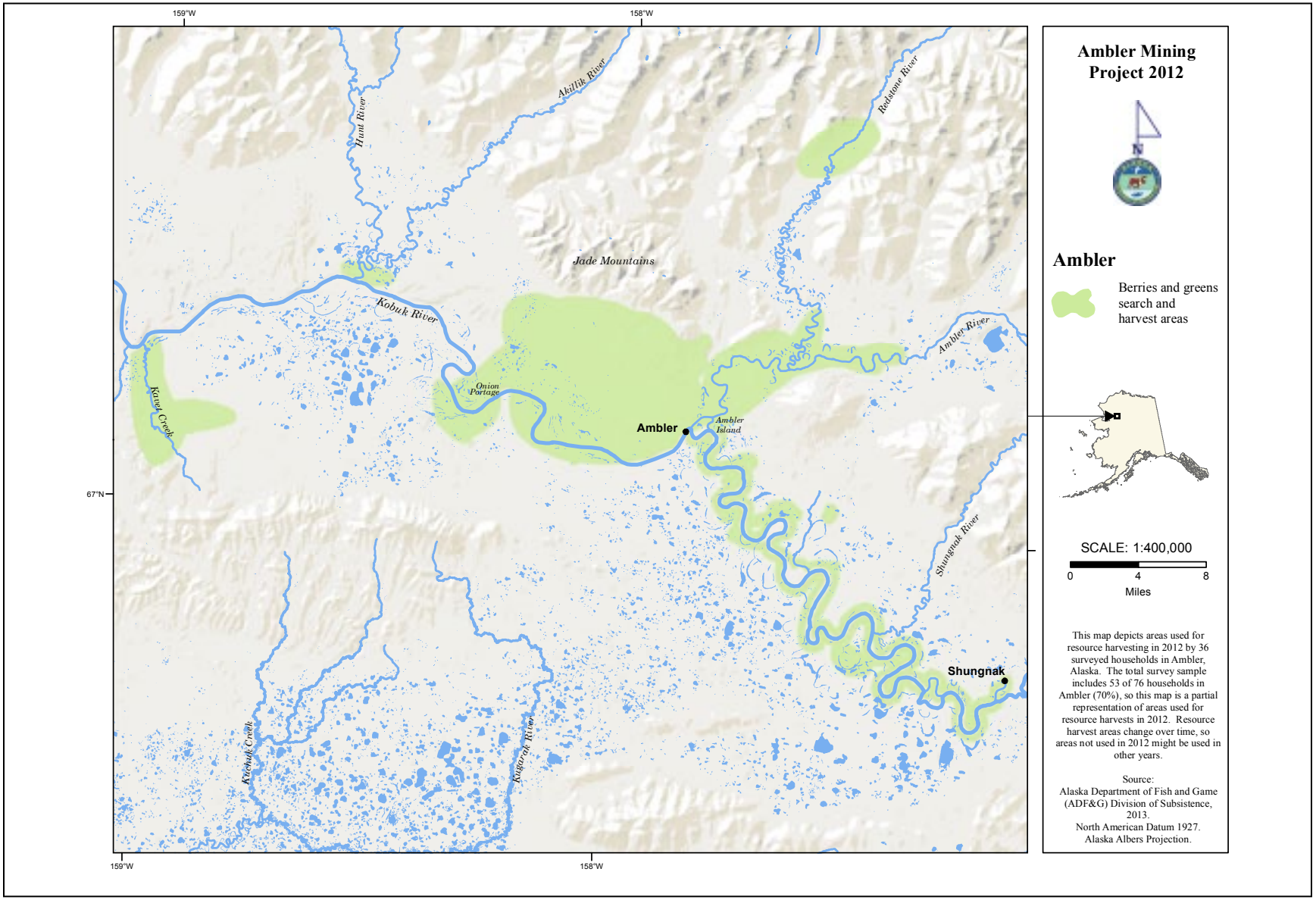

Figure 2-15.–Berries and greens search and harvest areas, Ambler, 2012.

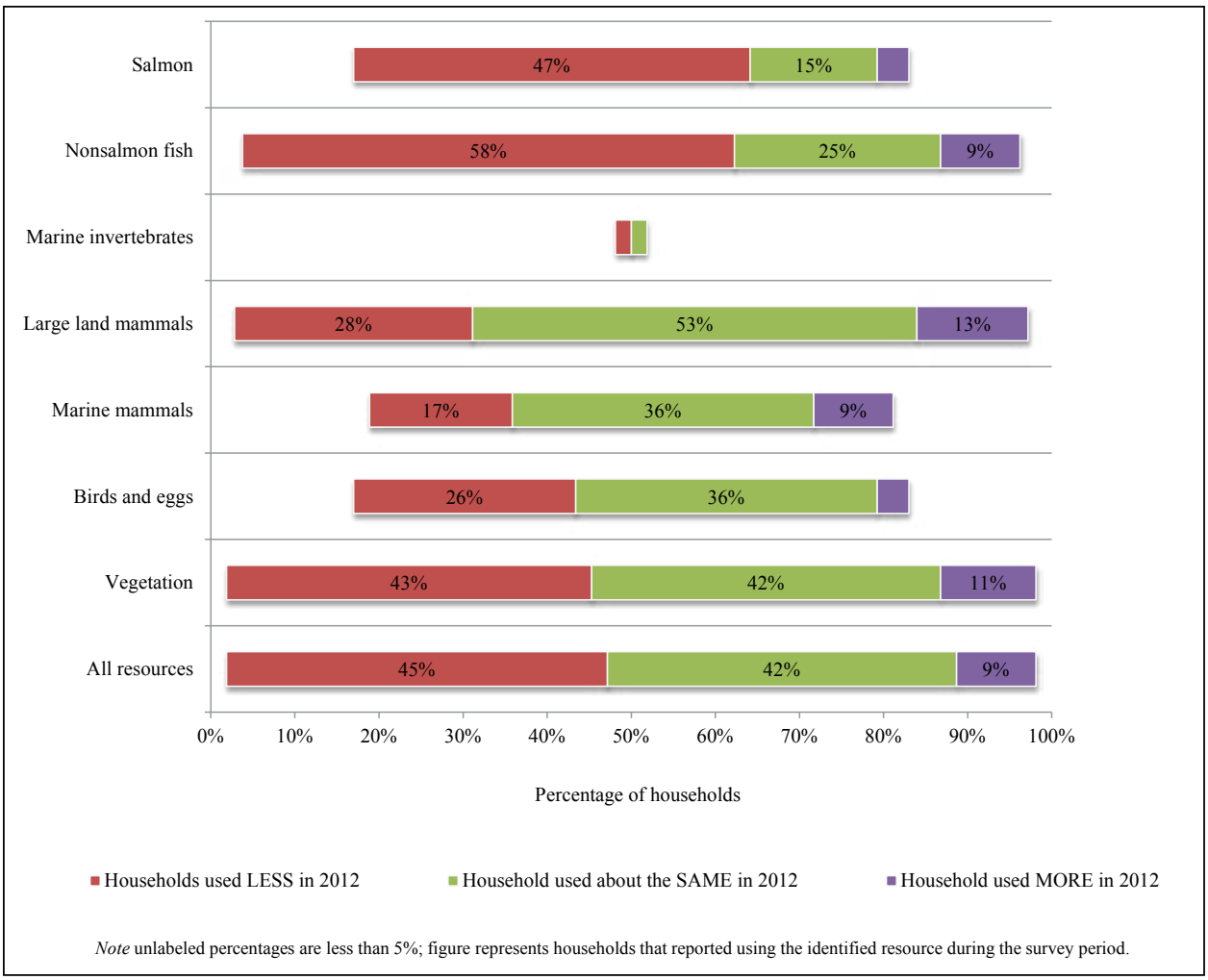

Figure 2-16.–Household uses of resources compared to recent years, Ambler, 2012.

anything differently as a result. Researchers characterized comments describing what people did differently and grouped them for analysis.

Together, Figure 2-16 and Figure 2-17 provide a broad overview of household harvest assessments. Percentages do not include households that did not answer the question or reported that they do not ordinarily use the resource.[22] Therefore, these figures only reflect the responses of households that ordinarily use a resource and provided an answer. A review of Ambler responses found that, in 3 categories, only 1–2 households skipped the question. In other categories, no households who use the resource skipped the question. The small number of responses for less commonly used categories, such as marine invertebrates, manifests in the chart as a very short bar. In contrast, widely used categories, such as nonsalmon fish or land mammals, appear as a longer bar.

Subsistence harvest success can also be assessed by comparing current harvest estimates with past harvest estimates. This comparison will be discussed in a later section.

Figure 2-16 shows a mixed set of responses to resources that a majority of households ordinarily use (nonsalmon fish, large land mammals, and vegetation).

With regard to nonsalmon fishes, which in Ambler's case are predominately whitefishes, 58% of households said they used less, 25% said their use was about the same, and 9% said they used more. Respondents most

22. For example, to ask a household that never uses marine invertebrates if it got enough of them is confusing.

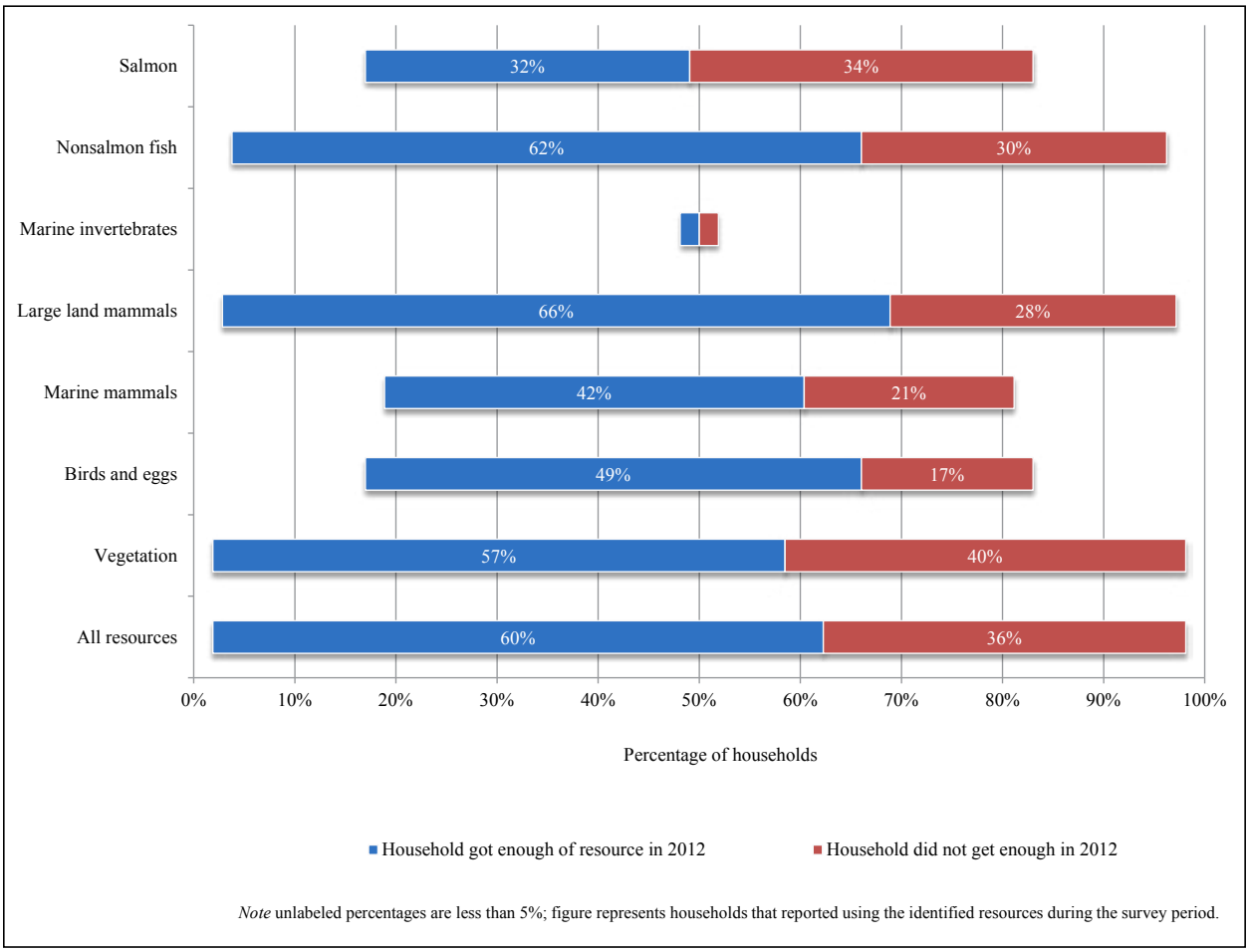

Figure 2-17.–Percentages of households reporting whether they got enough resources, Ambler, 2012.

commonly identified weather or environment as the cause for less use (Table D2-11), followed by lesser effort. The 2 reasons are likely interrelated because local users will not try to set a net during rainy, high water periods. These conditions cause risk to their nets, decrease the probability of success, and increase the likelihood that any fish caught could not be processed and would spoil. Despite many households using less, 62% of households said they got enough nonsalmon fish during the study period (Figure 2-17). Those households that did not get enough said they needed more fish in general, and they specified several whitefish species, burbot, and trout (Table D2-12). For these households, 31% said the impact of not getting enough was minor, 25% said it was major, and 44% said the impact was severe (Table D2-13). Households that said they did something differently as a result named several adaptive approaches, the most common of which was the use of other subsistence foods (Table D2-14). Other measures included increasing use of store-bought foods, bartering, getting public assistance, and increasing harvest effort.

Assessments of large land mammals use were the opposite: 53% of households stated that their use was about the same as previous years; only 28% said they used less (Figure 2-16).The most common reason given for this difference fell into the category of no equipment or equipment problems (Table D2-11). A review of survey comments shows that many respondents specifically identified a lack of gasoline for purchase in the community. Other reasons were mentioned less frequently, including less need (due to a smaller family), weather or environment, fuel prices, family or personal reasons, and others. Similarly to responses about nonsalmon fish, most households (66%) said they got enough large land mammals in the previous year (Figure 2-17). Of those that said they did not get enough, they overwhelmingly identified caribou as the species of which they needed more (Table D2-12). A few households mentioned moose and black bears. Reasons given for not getting enough mirrored “use” responses. Respondents most commonly

cited no equipment or equipment problems followed by weather or environment, and others. Forty percent of these households said the impact was either major or severe (Table D2-13). The most common adaptation by households was using more store-bought food (67% of responses), followed by asking others for help, or increasing harvest effort (Table D2-14).

Although vegetation was a small portion of total harvest by weight, plants and berries as a single category were widely used. Virtually equal numbers of households said they used less and said they used the same amount of vegetation in the study period (Figure 2-16). For those using less, weather or environment and resource availability were the most common reasons cited (Table D2-11). Forty percent of households said they did not get enough plants and berries, the highest for any resource category (Figure 2-17). Most responding households said they needed more blueberries (Table D2-12). As with fish, respondents most frequently named weather or environment as the reason for a lack of plants and berries, followed by resource availability, no equipment or equipment problems, and others (Table D2-11).

By a slight margin, more Ambler households said their use of subsistence foods overall was less in the study year than in recent years (45%) compared to those that said their uses overall were about the same (42%) (Figure 2-16). The chief reasons why households used less—weather or environment and no equipment or equipment problems—mirrored category-level assessments (Table D2-11). However, 60% of households said they got enough subsistence foods (Figure 2-17). For those that did not get enough, most cited no equipment or equipment problems and weather or environment.

Across all categories, small numbers of households said they used more subsistence foods than in recent years (Figure 2-16). They most frequently remarked that they used more because they received more from other households (Table D2-15.) Others said they used more because of increased need, increased effort, and receiving more help.

Food Security

Survey respondents were asked a set of questions intended to assess their household's food security, defined as, "access by all people at all times to enough food for an active, healthy life" (Coleman-Jensen et al. 2012:2). The food security questions were modeled after those developed by the U.S. Department of Agriculture (USDA) but modified by ADF&G to account for differences in access to subsistence and store-bought foods. Based on their responses to these questions, households were broadly categorized as being food secure or food insecure following a USDA protocol (Bickel et al. 2000). Food secure households were broken down further into 2 subcategories—high or marginal food security. Food insecure households were divided into 2 subcategories: low food security or very low food security.

Households with high food security did not report any food access problems or limitations. Households with marginal food security reported 1 or 2 instances of food access problems or limitations—typically anxiety over food sufficiency or a shortage of particular foods in the house—but gave little or no indication of changes in diets or food intake. Households with low food security reported reduced quality, variety, or desirability of their diet, but they, too, gave little indication of reduced food intake.

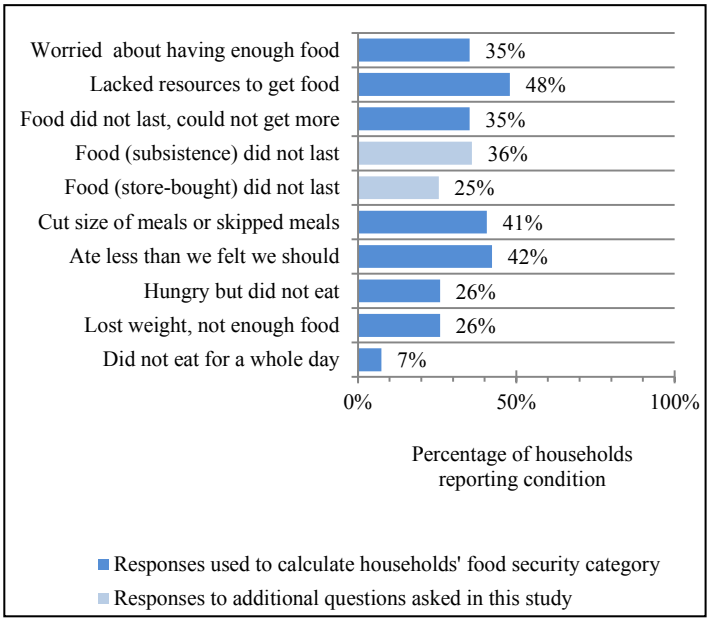

Figure 2-18.–Responses to questions about food insecure conditions, Ambler, 2012.

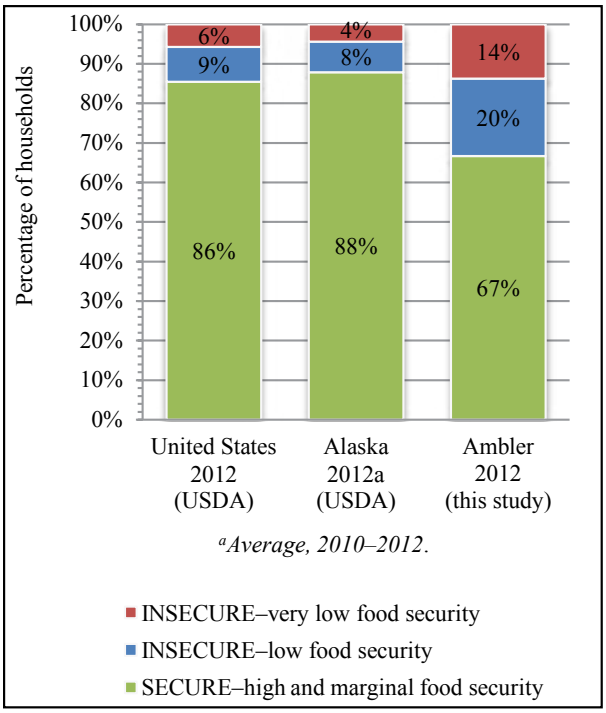

Figure 2-19.–Food security categories, Ambler, 2012.

Households classified as having very low food security were those that reported multiple instances of disrupted eating patterns and reduced food intake (Coleman-Jensen et al. 2012:4).

Core questions and responses from Ambler residents are summarized in Figure 2-18. Food security results for surveys for Ambler, the state of Alaska, and the United States are summarized in Figure 2-19. Ambler had higher percentages of households considered food insecure than Alaska overall and the United States in general—Ambler's population of those with low and very low food security was more than double those in both Alaska and the U.S. (Figure 2-19).

Nearly half of Ambler respondents (48%) said they lacked the resources they needed to get food (Figure 2-19). The modified food security questionnaire used in this study defined a "lack of resources" as not having what was needed "to hunt, fish, gather, or buy food." More households said they ran out of subsistence foods and could not get more (36%) than ran out of store-bought food and could not get more (25%). Higher percentages said they cut the size of meals or ate less than they felt they should. About one-quarter of households experienced times in which they were hungry but did not eat because there was not enough food, or they lost weight because of a lack of food. Very few (7%) reported not eating for a whole day.

Households that reported food insecure conditions (i.e., their food did not last, and they could not get more) were asked to name the months in which those conditions existed. Figure 2-20 portrays the mean number of food insecure conditions per household by food security category by month. The most food insecure households experienced their highest food insecurity in winter months; the level of food insecurity dropped in spring and summer, but it began increasing again in August. Households of low food security followed a similar pattern, but did not experience increasing insecurity again until well into November. The extreme weather events of July and August, which disrupted fisheries in late summer and early fall, may have had a greater impact on the very food insecure households. During community review and in survey comments, residents suggested that alcohol and drug abuse may also influence food insecurity in Ambler. In rural Alaska communities, food insecurity typically decreases during spring and summer months, when subsistence activities gear up and peak, a pattern which continues into fall. In general, more food is available. Spring, summer, and fall have the best conditions for travel and subsistence activities, and they usually require less fuel to heat homes. Households that showed high or marginal levels of food security demonstrated no difference in food security conditions during the year.

Household Specialization in Resource Harvesting

Previous studies by the Division of Subsistence (Wolfe and Walker 1987; Wolfe et al. 2010) have shown that in most rural Alaska communities, a relatively small portion of households produces most of the community's fish and wildlife harvests, which they share with other households. A recent study of 3,265 households in 66 rural Alaska communities found that about 33% of the households accounted for 76% of subsistence harvests (Wolfe et al. 2010). Although overall, the set of very productive households was diverse, factors that were associated with higher levels of subsistence harvests included larger households with a pool of adult male labor, higher wage income, involvement in commercial fishing, and community location.

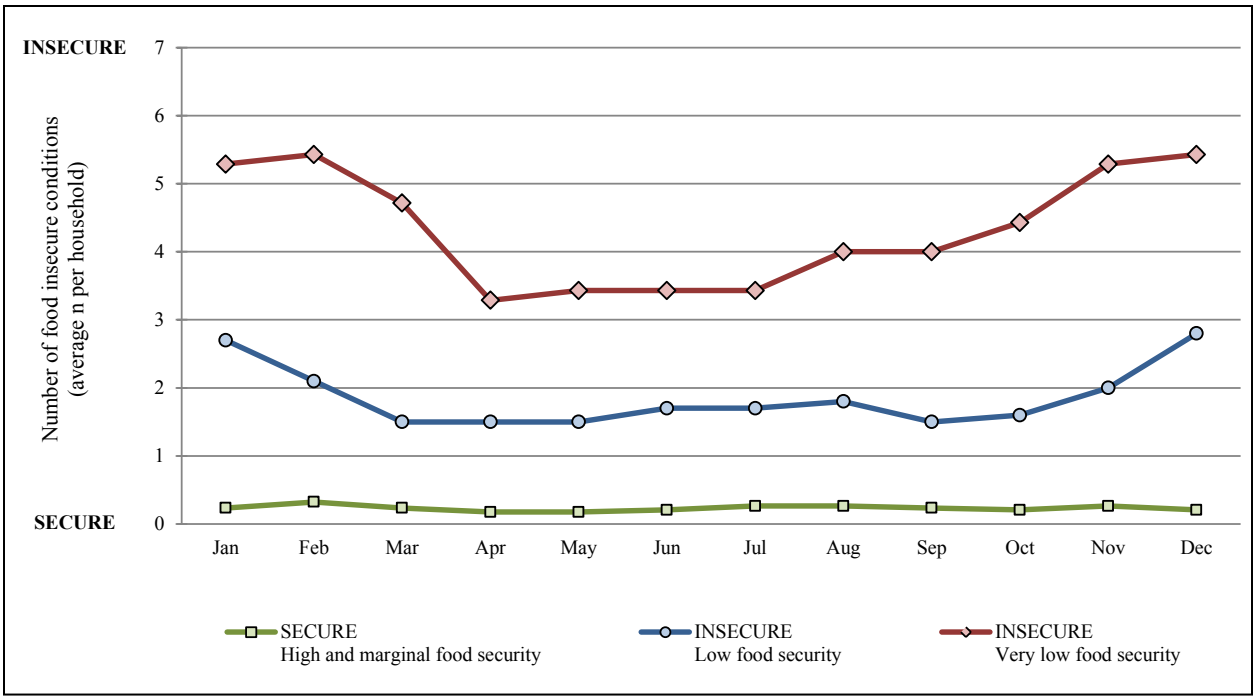

Figure 2-20.–Mean number of food insecure conditions by month and by household security category, Ambler, 2012.

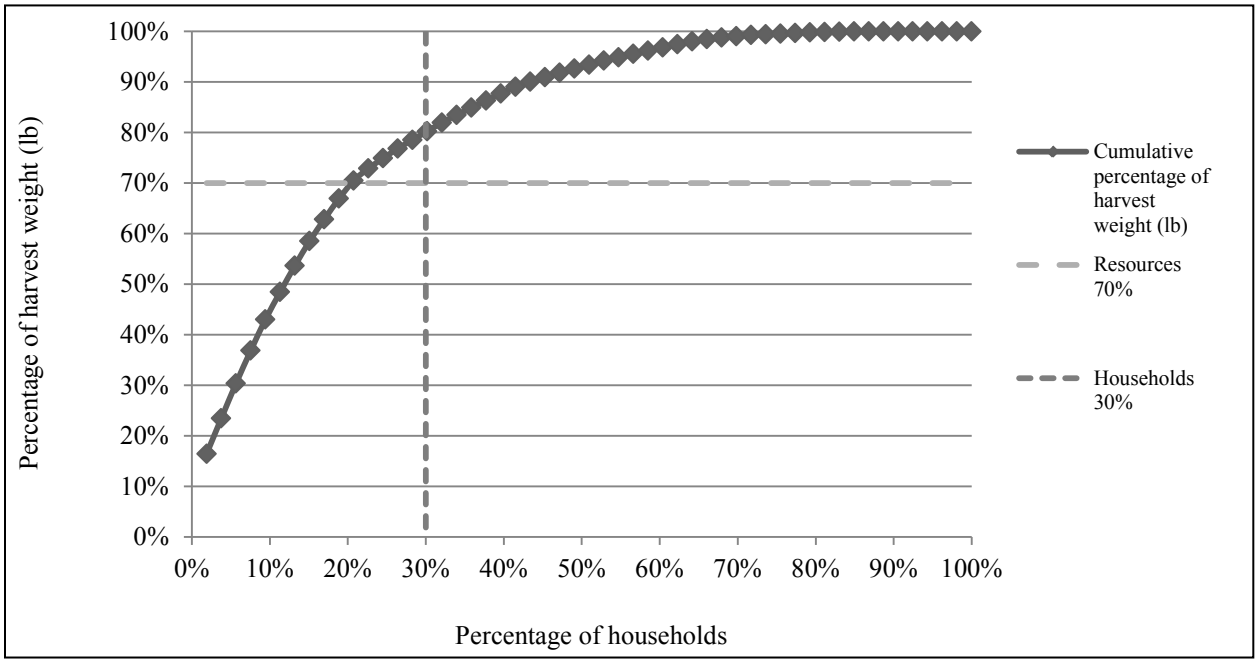

Figure 2-21.–Household specialization, Ambler, 2012.

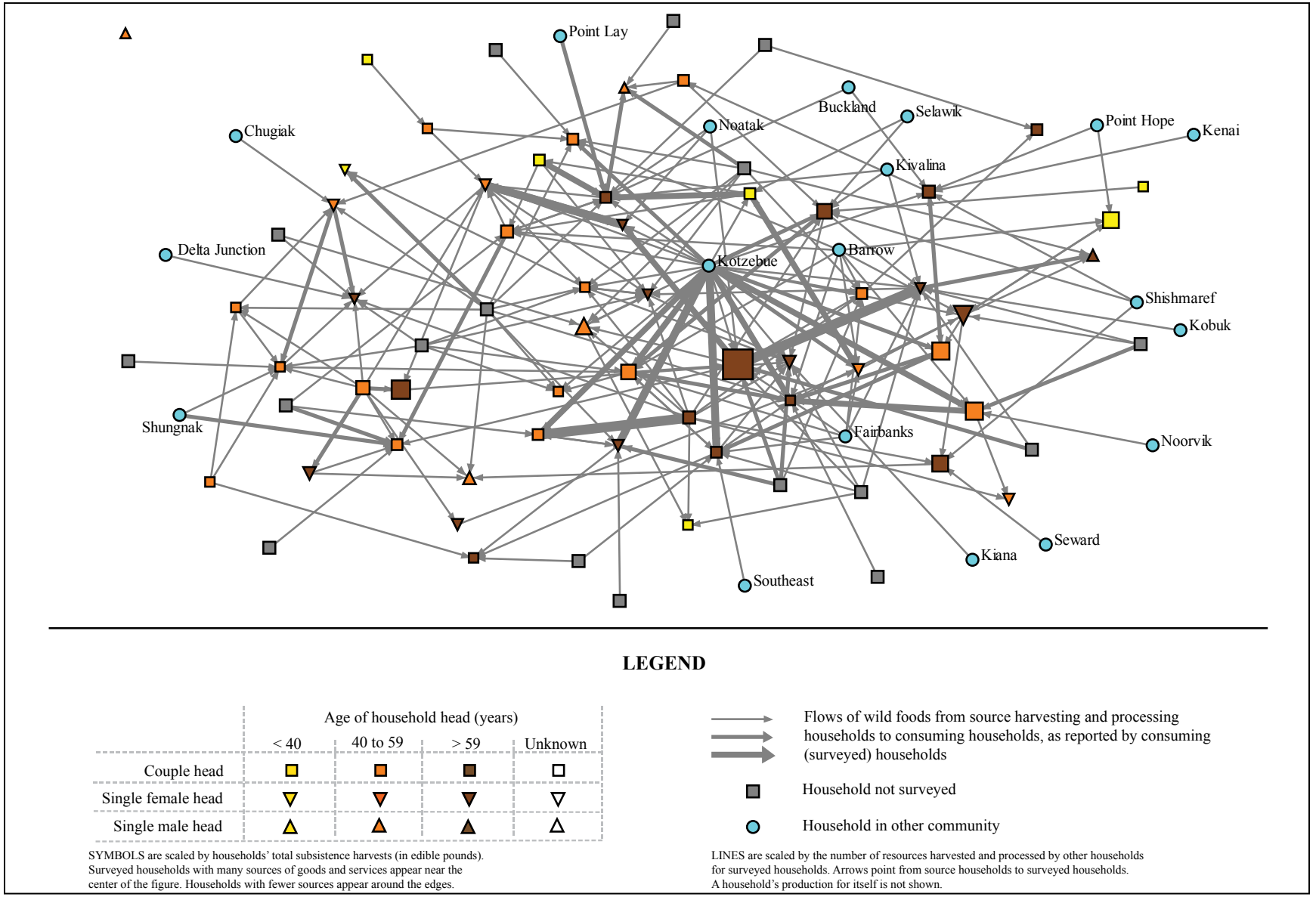

Figure 2-22.–Wild food harvesting and processing network, Ambler, 2012.

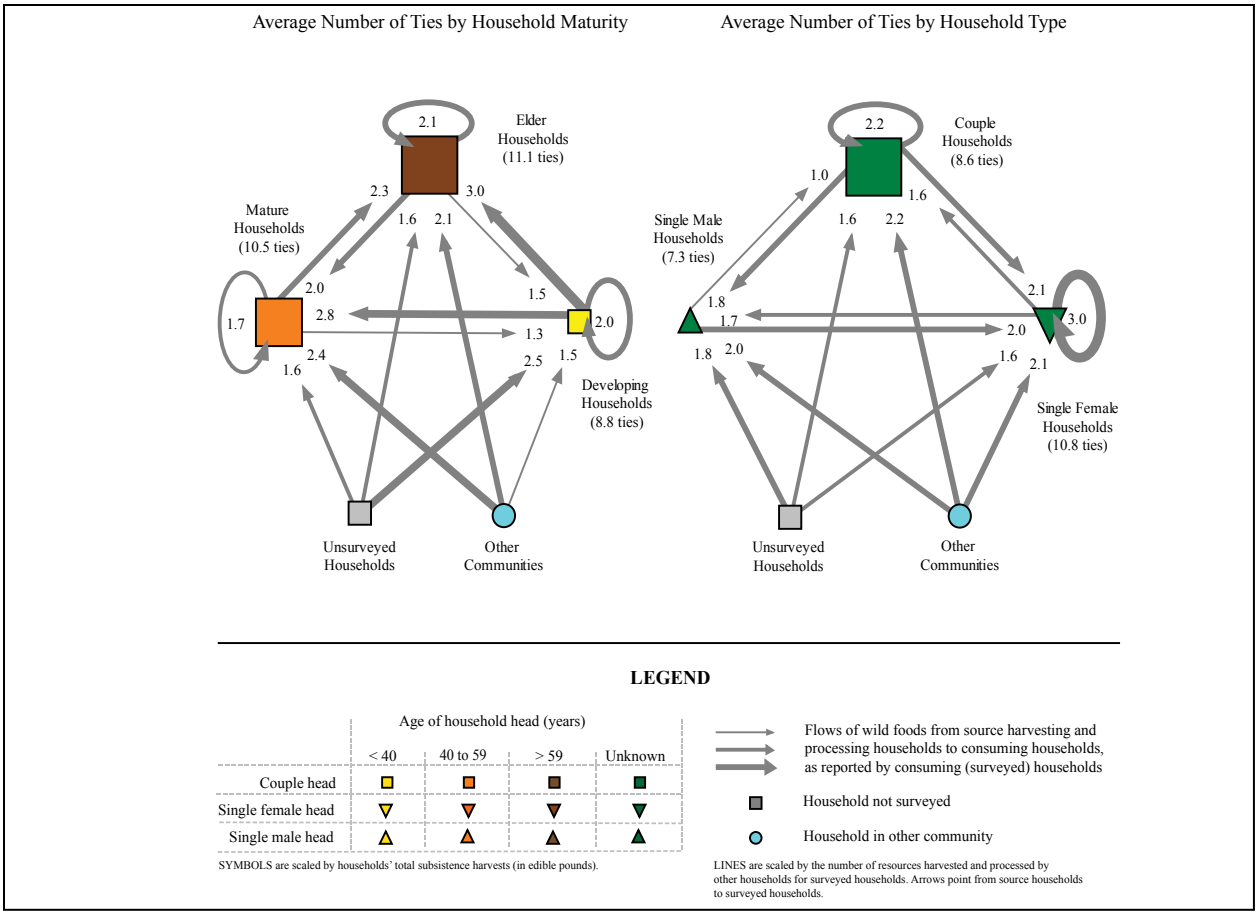

Figure 2-23.–Wild food harvesting and processing network by household maturity and household type, Ambler, 2012.

As shown in Figure 2-21, during the study year in Ambler, 23% of households harvested about 70% of all wild foods harvested by the community as estimated in edible pounds. The characteristics of highly productive households will be discussed in the networks section of the chapter.

Wild Food Networks

While subsistence harvest surveys collect information based on individual households, in reality, much of the production (harvest and processing) of subsistence foods is achieved by households within a community that work cooperatively. This cooperation is often organized based on kinship in the manner of traditional Inupiaq communities. The organization of the contemporary mixed market–subsistence economies that characterize rural Alaska communities has been documented ethnographically by numerous researchers. Of particular interest for northwestern Alaska are reports from Anderson et al. (1977), Burch Jr. (1988), Ellanna (1983), Langdon and Worl (1981), Magdanz et al. (2002), Wolfe and Walker (1987), Wolfe and Ellanna (1983), and Fall (1990).

Cooperation in the production of foods is only part of the picture. Subsistence foods are widely distributed among households within a community through sharing, barter, and trade (Charnley 1984; Kari 1983; Lonner 1980; Magdanz and Wolfe 1988; Magdanz 1988; Magdanz et al. 2007; Pete 1991; Schroeder et al. 1987; Stickney 1984; Stokes 1985; Wolfe and Magdanz 1993).

In this study, survey questions asked households who harvested and processed the subsistence foods they used during the year. If a resource was received by a household, the respondent was also asked which household in the community shared or traded that resource with them. Confidentiality was preserved by

identifying households only by a random identification number. If a source household lived in another community, the name of the community was recorded.

Figure 2-22 depicts a network of wild food exchanges[23] between households in Ambler and with households in other Alaska communities. The figure is a partial representation of sharing, trade, and barter in the study year because it only documents the food flows into the 53 surveyed households. Symbol shapes depict the type of household, their colors show the age of heads of household, and their size is scaled to indicate the amount of a household's subsistence harvest by edible weight. Arrowed lines show the direction of the exchange and are weighted to show multiple exchanges. Households or communities near the center of the figure were the most active in the network, either by receiving food or services (labor) from others, or being identified as a source by others.

Previous studies have found a positive association between the ages of household heads and the amount of subsistence foods harvested. Household characteristics associated with higher food production include the presence of multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing households included single female household heads, age of elders, non-Native household heads, and single-person households (Wolfe et al. 2010).

The 53 surveyed households in Ambler reported 88 sources of support, with most sources residing in Ambler. On average, Ambler households were connected to 5 other households or communities. The minimum number of sources was 0, seen for 1 household on the upper left margin of Figure 2-22, and the maximum number reported was 24. Ambler households reported sources in 19 other Alaskan communities, 9 of which were in the Northwest Arctic Borough. Kotzebue, the regional center, was named as a source by 24 Ambler households.

Ambler households identified 892 exchanges (either subsistence foods or labor). On average, an Ambler household in the network had 7 exchanges with other households or communities. Only 1 surveyed household had 0 exchanges; the maximum number of reported exchanges was 29. Several mature and elder-headed couples were central to the network; 1 high harvesting elder household in particular gave support to and received support from many others. The community of Kotzebue figures prominently in the network, and multiple households also named Barrow, Fairbanks, and Kivalina. Ambler households reported 71 instances of support from Kotzebue and 18 from Barrow. Most other communities appear on the periphery of the figure. The majority of exchanges occurred between Ambler households.

Figure 2-23 depicts the Ambler wild foods network with individual households collapsed into groups by household maturity and types of heads. Their average harvests are represented by the size of symbols. Elder households, on average, harvested more wild food (by edible weight) than mature households, which harvested more than developing (young) households. Elder and mature households had similar numbers of food sources, averaging 11.1 and 10.5 sources, respectively. While developing households harvested less subsistence foods, they were more often a source of support for elder and mature households than vice versa. Developing households also reported fewer sources of support from other communities. Looking at household structures, couple households produced far more than either single female-headed households or single male-headed households, and they were named as a source of support more often than households headed by single people. Single female-headed households harvested more than their single male counterparts, but received more instances of support from single male households than they provided them.

23. These exchanges may be goods (subsistence foods) or services (labor, i.e. harvesting or processing of subsistence foods.)

Comparing Harvests and Uses in 2012 with Previous Years

Harvest Data

Limited data exist for Ambler subsistence harvests prior to this survey. No comprehensive subsistence harvest survey had taken place before this study. Migratory bird harvest information was collected for 1998 (Georgette 2000). Big game harvest surveys were conducted twice previously: for 2003[24] and 2009–2010 (Braem 2012). The most complete data set is for salmon, sheefish, and other whitefishes between 1994 and 2004 (Magdanz et al. 2011). The discussion that follows will describe differences in patterns of use between this study's results and previous data. Per capita harvests are a useful index to discuss trends because a per capita value controls for changes in community population. As noted earlier in this report, Ambler's population has decreased since 2000; thus, the total harvest may have decreased in response. However, this survey shows that harvests per person may not have decreased.

Total chum salmon harvests declined since 1994, but the steepness of the trendline can be attributed to the relatively high harvest in 1994, which was nearly double that of the next 2 highest years (Figure 2-24). The 1,621 estimated chum harvested in 2012 fall within the range of harvests of the previous 15 years, which varied between a low harvest of 1,719 in 2003 to a high harvest of 5,009 in 2000. Harvests of other species of salmon are minimal in that time period, as in 2012, occurring on a much smaller scale. Pink salmon harvests, with the exceptions of 1996 and 2003, were less than 20 annually. Previous survey data for Chinook, coho, and sockeye salmon harvests do not appear in the figure because they are infrequent and few in number (Magdanz et al. 2011:49).

Because the 1994–2004 data collection asked about sheefish as a species, but lumped other smaller whitefishes together, Figure 2-24 is organized similarly for comparison. Sheefish harvests show a modest decline over time: they ranged from 743 in 2003 to 3,051 in 1994. This study's estimate of 1,556 falls squarely within that range. Harvests of other whitefishes taken together have varied a great deal more: from 3,326 to 35,118 in the same period. The 2012 total of estimates of other whitefishes is the third lowest recorded at 10,802.

Caribou harvests documented since 2003 show a slow increase over time (Figure 2-25). At 685 animals, the 2012 estimate is the highest of the 3 estimated harvests. Moose harvests over the same time period show no trend; the 2012 estimate of 14 moose is higher than both prior estimates. The 2012 black bear harvest estimate of 9 bears also topped previous estimates. Brown bear harvests for food remained minimal; harvest estimates varied from 1 to 4 animals in previous surveys. Per capita harvests of caribou increased from 176 lb to 330 lb.

Migratory birds harvests show a pattern of decreasing harvest and use (Figure 2-26). In the 1998 harvest survey, 83% of households used migratory birds. Bird hunting was a common activity; 77% of households hunted migratory birds and 74% reported harvest (Georgette 2000). Forty percent of households gave away harvested migratory birds, and 46% of households received them. In contrast, only 59% of households used migratory birds in this study. Forty percent of households hunted them and 38% harvested them. Per capita harvests also declined from 57 lb per capita in 1998 to 8 lb per capita in 2012.

In the 1998 study of bird use, 5 species predominated by numbers harvested: willow ptarmigan, Canada geese, mallards, northern pintails, and long-tailed ducks (also called oldsquaws.) In this study, ptarmigan were again taken in the greatest numbers, followed by white-fronted geese, Canada geese, mallards, and northern pintails. White-fronted geese were an exception to the trend of decreasing harvests, with more harvested in 2012 than 1998.

24. Georgette, S., A. Ahmasuk, K. Persons, E. Shiedt, and E. Trigg. Subsistence wildlife harvests in three northwest Alaska communities, 2003–2004. Alaska Department of Fish and Game, Kawerak, Inc., and Maniilaq Association, unpublished report, 2005.

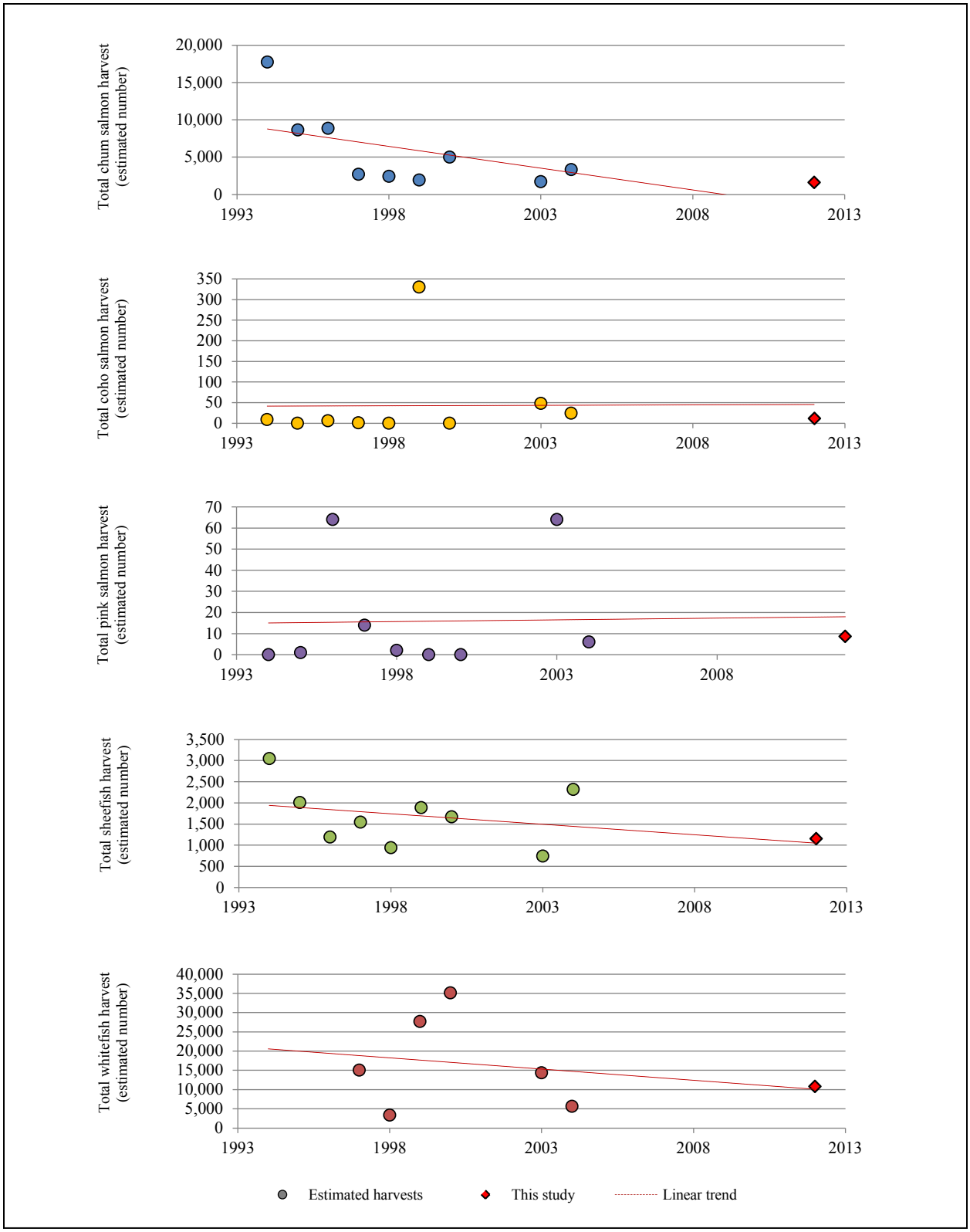

Figure 2-24.–Estimated total number of chum salmon, coho salmon, pink salmon, sheefish, and whitefish harvested, Ambler, 1993–2012.

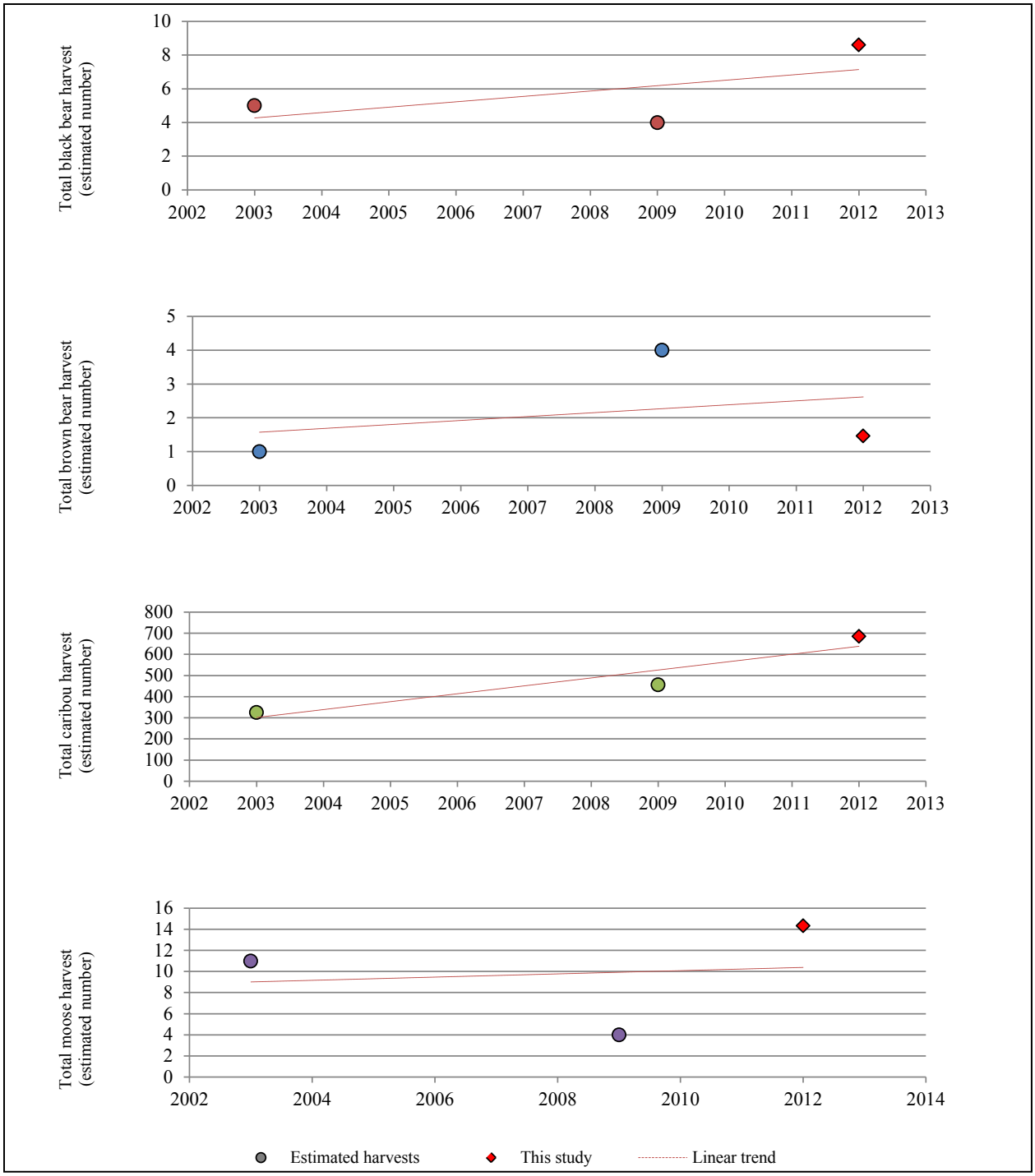

Figure 2-25.–Estimated number of black bear, brown bear, caribou, and moose harvested, Ambler, 2002–2012.

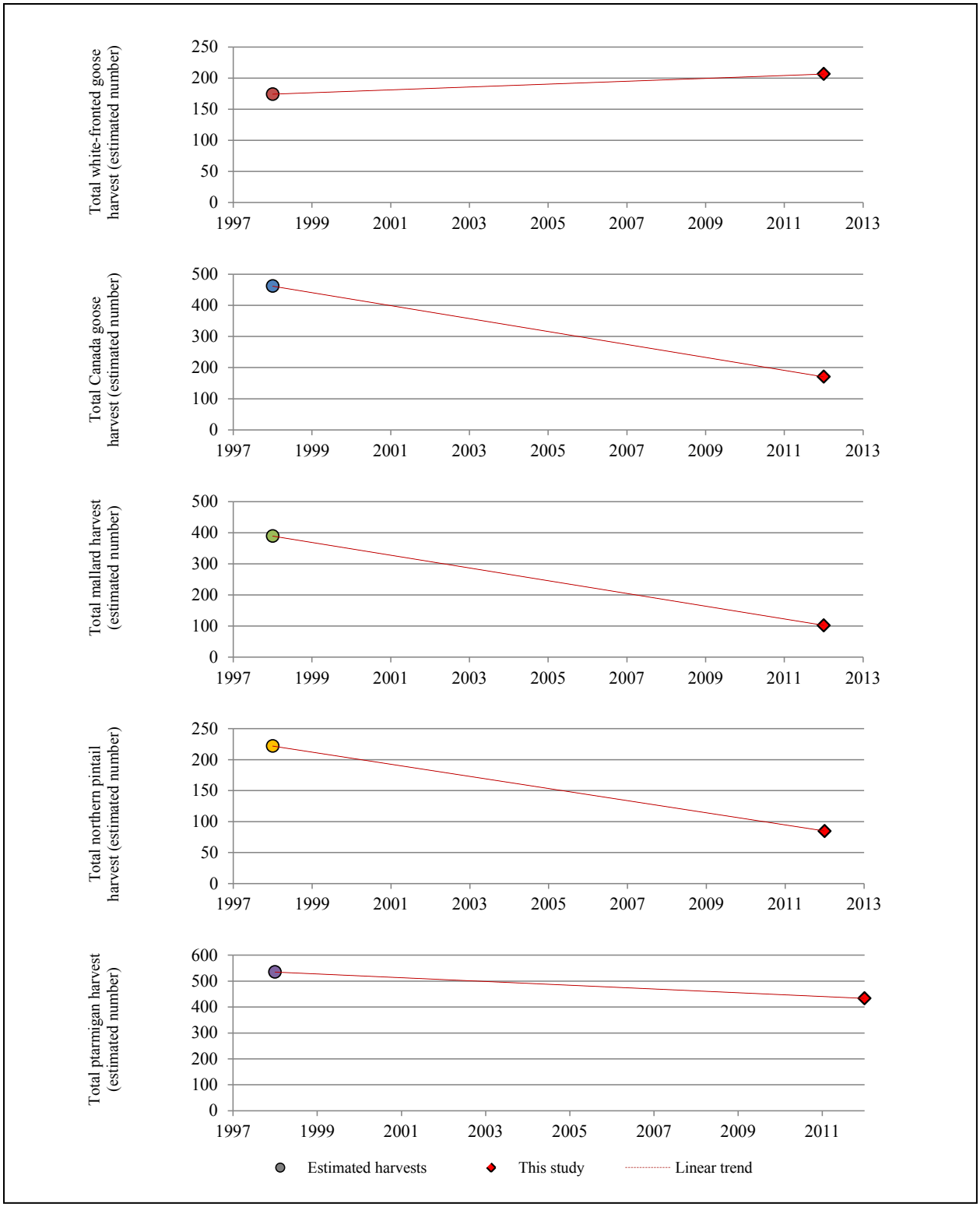

Figure 2-26.–Estimated number of white-fronted geese, Canada geese, mallards, northern pintails, and ptarmigans harvested, Ambler, 1997–2012.

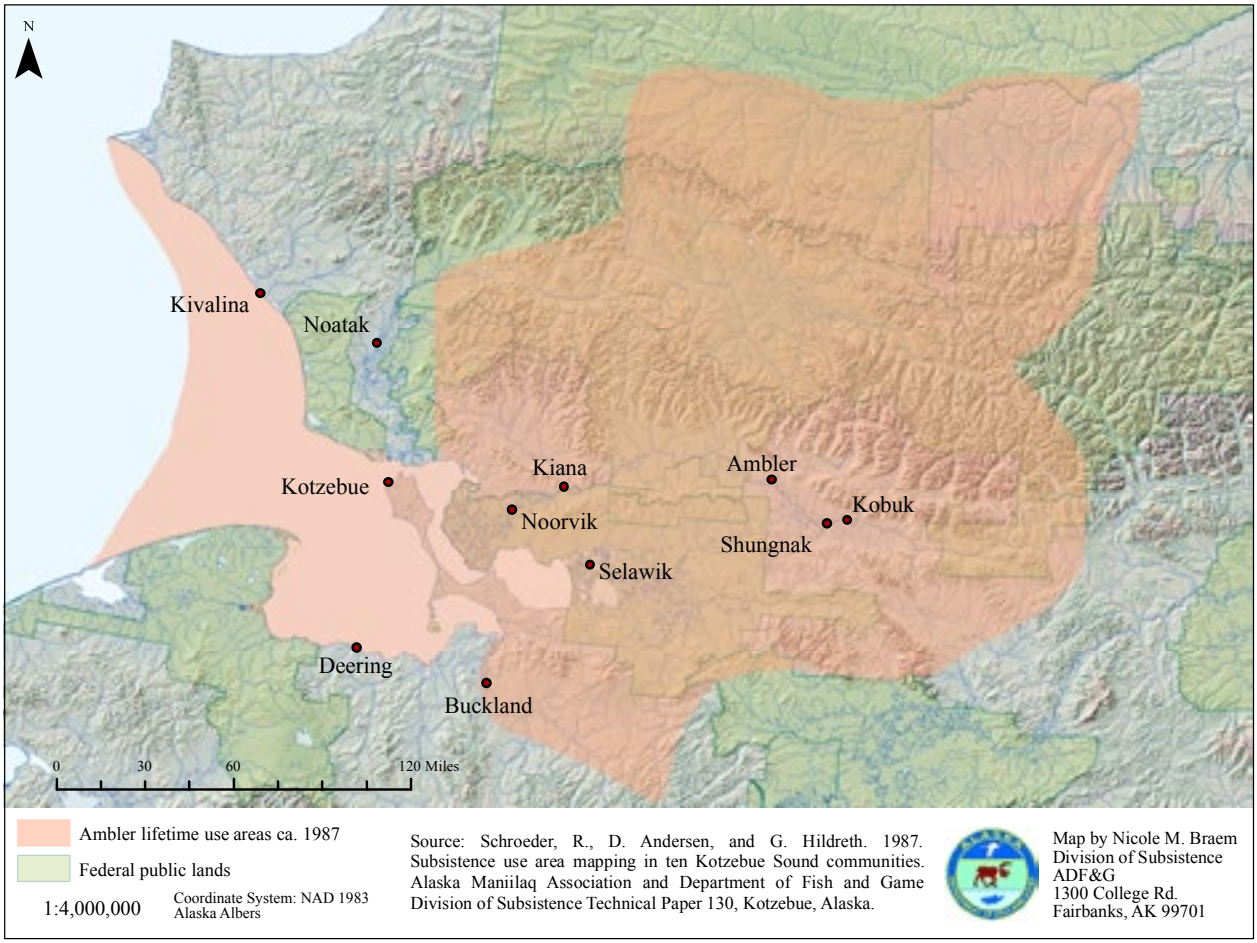

Figure 2-27.–Lifetime harvest and use areas, Ambler, 1987.

Current and Historical Harvest Areas

The most recent and comprehensive study that mapped use areas of Ambler residents was completed in 1987 and documented lifetime use areas; about 35 residents, including elders and hunters, contributed to the field mapping in 3 mapping sessions (Schroeder et al. 1987).[25] The difference between the historical dataset and this study's dataset (use areas spanning decades of experience versus a 1-year snapshot of areas used) makes it difficult to draw comparisons or conclusions. The lifetime use area included waters of the Chukchi Sea and Kotzebue Sound from Point Hope to Shishmaref, as well as Hotham Inlet and Selawik Lake (Figure 2-26). Inland areas extended west from Ambler nearly to the Noatak River, reaching the Agashashok and a portion of the Noatak river drainages. To the north, the area extended past the Baird Mountains across the Brooks Range into the coastal plain and the Colville River drainage. Areas used to the east extended up the Kobuk River drainage to the vicinity of Walker Lake and upper Noatak drainage. Researchers also documented additional areas to the south and west as far as Buckland.

The extensive community use area described by maps in Schroeder et al. (1987) point to the need for updated use area information of a greater time depth than 1 year. Local comments about how gas prices and lack of available gasoline for purchase limited the total area used for subsistence in 2012 demonstrate the

25. Schroeder et al. (1987) reviewed existing land use maps for the region and found that the sources used differing methods and that the maps were drawn to answer a variety of research questions. "In our review we found that none of these sets, however, provided the type or quality of subsistence land use documentation needed at the present time" (Schroeder et al. 1987:3). For information about the sources used in Schroeder et al. (1987), see that report's bibliography.

need for a subsistence land use study of several decades' scope to understand use patterns prior to recent limitations on travel.

Local Comments and Concerns

The following section summarizes local observations and concerns regarding wild resource populations. Ambler residents voiced these comments during the household surveys, the key respondent interviews, and the community review meeting of preliminary data. Concerns are not always shared equally among community members, and summaries in this report do not mean to imply that this list is either comprehensive or unanimous. However, the issues described here were common, and they provide important points of discussion or further study. Comments received during the survey in their complete form are compiled in Table D2-16.

Climate

As described earlier, prolonged rains in 2012 disrupted local fishing patterns. Additionally, a lack of snowfall in early winter impeded activities usually carried out by snowmachine: trapping, hunting, wood-gathering, and travel. Survey respondents made few comments regarding environmental and climate change, but key respondents offered several observations of local changes. These include erosion and other changes in the Ambler River, earlier breakup, delayed freeze-up, increased rain, and changes in the fish populations. One described how the channels to the east and west of Ambler Island are changing as well, and how that influences erosion in front of town. The erosion, in turn, affects the eddy:

> Isiaqpak[26] is eroding back. Isiaqpak used to go up here and this is the island, and this used to be the Kobuk River. And then, my wife said when she was a little girl, this went way, way up and there was just a little trickle of water behind here. But yeah, the river used to come down and instead of coming down this way [indicating channel on west side of Ambler Island] went around the island this way [indicating east side of Ambler Island]. So the Ambler River and the Kobuk joined above there, and then this has eroded over time, was um, you know, and then this channel has changed … And this is hollowed out, [gesturing towards front of town] this is getting real shallow in here. And now, where the Ambler River comes out, this is real shallow now. The channel you have to go all the way almost to this way and then turn, and it's a real narrow deal. And then with our erosion in front of town, um, the way that the ice comes back the Isiaqpak gets shorter and shorter, then the ice comes back in closer to town. (ABL07021013)

A U.S. Army Corps of Engineers assessment of erosion at Ambler noted that erosion on the shoreline near town primarily occurs in spring. More than 40 feet of riverbank have eroded in the last 30 years.

> In 1984, the Alaska Department of Transportation reported that an approximately 1,500-foot area of new development along the riverbank upstream from the barge landings is eroding because seepage from upslope keeps the glacial till saturated and the main Kobuk River channel impinges on the bank at nearly a right angle. (U.S. Army Corps of Engineers 2009)

Key respondents agreed that the Ambler Eddy is filling in and slowly changing (ABL03020713; ABL07021013; ABL02020713). "The Ambler Eddy has been really good for as long as Ambler existed, and it still is, although it's slowly filling in by the Ambler River mouth moving further and further and further down, the eddy, the hole is still there" (ABL02020713).

Climate change may also be impacting traditional fish and game processing techniques, which include drying, aging, and freezing, among others. Drying (usually accomplished without salt) allows local residents to preserve large quantities of meat without taking up freezer space—and because of the large quantities of

26. A point of land on the side of the river opposite the community of Ambler. Identified in Anderson et al. (1977) as "'Isigak-pak', big foot, a point of land."

wild foods harvested, not everything can go into a freezer. High temperatures and rain interfere with drying; if the temperature is too warm, meat or cut fish will spoil (or "sour") before it can dry, and if the weather is too damp, it will mold. Although weather has always been variable, local understandings of general patterns allowed people to adjust. These general patterns, however, have altered:

> A normal year 20 years ago, it would be that the summer was fairly dry and uh, it should be. There is a short rain period in August almost always, and there always been, but that rain period has increased, it is now maybe three times longer than it was 23 years ago. We are also starting to see rains in July, which 23 years ago was pretty much absent. We are not getting the snow in the winter, we're getting the precipitation in the summer instead, that is what's going on. It may be that precipitation is generally just the same every year, I'm not sure on that, I'm not measuring the precipitation, but my guess is that it hasn't changed a whole lot, it's just coming at different times now. We have more rains and less snow basically. (ABL02020713)

The winter of 2012–2013 was a low snow year; area residents did not have enough snow for travel by snowmachine until early 2013. Overall, there was much less snow than usual (ABL07021013; ABL01021013; ABL02020713).

> Last year [2011] we had 6 feet of snow on the ground this time of year, and the traveling was good, and for wood hauling and that kind of stuff it was good. This year [2012] we barely got 2 feet of snow on the ground, and it's not covered up a lot of the brush and stuff so the places I would like to go, and the creeks have water in them, overflow. It's a concern. (ABL07021013)

Respondents also mentioned later onset of fall and winter, and thus freeze up, accompanied by later whitefish runs (ABL01021013; ABL02020713; ABL07021013). October is a different month than it used to be, said one respondent; the weather is nice—but it is not becoming winter:

> In 1990, we would typically start fishing, end of September beginning of October. Right there. And now, we are actually starting fishing at the end of October, fishing into November, so there could be something in 23 years there's probably a delayed peak of the whitefish run, or at least 2 weeks if not 3 weeks, it could be as much, well I wouldn't say 4 but probably about 3 weeks delay, in the 23 years. And that has been continuously just later and later and later... The benefit we see as far as subsistence goes is that at least the fish is keeping tabs with the cold weather so that we can preserve the fish without freezers. So nature takes care of itself and it's great, you know we can stack them out and we can preserve the fish without having to use freezers. (ABL02020713)

This respondent, a very active fisher, described changes in the Ambler River. Increased algae growth in sections of the river has resulted in areas that are no longer good spawning habitat for least cisco and humpback whitefish. He speculated that this may be due to a longer open water period and less washout during breakup because of less snow. Runs of least ciscos and other whitefish have decreased:

> Around 1998, 2000 the river changed enough that we were getting schools of either grayling or pike instead. Large schools, I mean when the pike started to show up in schools we were really puzzled, we would be seining in there, where we were seining for whitefish, and we would pull in 200 pikes instead, you know. Or multiple hundreds of grayling in the same kind of a deal. So what we saw over the years is that there was a slow change from whitefish vegetarians, to predators, and the predators were increasing every year. Year by year by year by year. And the whitefish backing off. (ABL03020713)

In addition to these changes, salmon now seem to be spawning further up the Ambler River than before. Formerly, Cross Creek or Angus Creek were the farthest upriver he had observed them; now they are spawning up above Naniratkohart Creek.

User Conflict

User conflict between local subsistence users and nonlocal hunters and fishers does not feature prominently in key respondent interviews or comments received from Ambler residents. This may reflect the broad scope of the key respondent interview questionnaire, which tries to cover many topics of interest. It may also reflect the interests and backgrounds of individual respondents or the timing of the survey (mid-winter). Two of those interviewed said they had experienced issues with airplane traffic (associated with transporters or guides) while caribou hunting in fall 2012. Another said that disturbance by airplane traffic was common, but the presence of other hunters varies year to year (ABL01021013).

Survey comments on regulations that are presented in Table D2-16 were varied:

> A spring moose hunt is badly missed. Shifted use to sports hunters rather than subsistence users. They don't need moose in the fall, they need it in the spring.
>
> Would like to see more locals involved in subsistence advisory councils and as decision makers.
>
> There needs to be another [license] vendor. Some people are afraid of buying permits online, because of fears of giving credit card info.

Development

Ambler residents expressed mixed feelings about the proposed road to the Ambler mining district. Some comments received were absolutely against a road and mine because of possible impacts to subsistence and the environment from environmental contamination, impacts to caribou migration, and increased access for nonlocal hunters. Others speaking in favor of a road and mine felt that such development might bring lower prices and jobs. These mixed sentiments are presented in Table D2-16:

> [It's] going to bring people in, and it's really going to affect Ambler. [I'm] all for the jobs but don't want to see a road. [I'd] rather see a railroad to Golovin. [It would have the] least impact on migration routes and the number of people who will impact subsistence resources.
>
> Concerned that the road will have a negative impact on subsistence, but will hopefully provide jobs and an incentive for jobs skills development in Ambler and an incentive for students to stay in school and graduate from school.
>
> It's good to have a road but it also will affect hunting. Prices might drop (a benefit). Some concern about what might happen if the road opens … more people hunting. Don't want to see hunting affected by increased access.

Cost of Commodities

Gasoline and stove oil prices in the upper Kobuk River region are among the highest in the state of Alaska. This is due to the remoteness of the community location and the means by which fuels are delivered. When barges are unable to reach these communities, fuels must be delivered by air. Very high local prices of groceries and other goods correspond to high fuel prices.

The price of gasoline in Ambler in 2012 was $11.00 per gal, and fuel oil cost $10.75 per gal. However, Ambler is unique among study communities in that it often does not have gas for purchase. When Division staff was conducting fieldwork in 2013, the community had been out of gas for approximately a month. Several residents commented on the situation (Appendix D2-16). "Gas is always a problem. Right now we could go out, but I can't get gas. I am willing to go out for those who don't have a snowmachine, but I don't. Food is available out there, but there is always a problem with gas." Another stated, "The gas and stove oil situation is terrible. We have the resources but need the gas. Expensive is a problem, none is a disaster." Key respondents commented on gasoline availability and prices as well. "It is unfortunately common that

we don't get enough gas in just before hunting or fishing season to get around, because when it happens, everybody immediately buys up all the gas and we are out again" (ABL03020713).

High gasoline prices are also affecting local subsistence patterns by limiting the distance people can afford to travel and the number of trips they can take:

> I would say that one thing I see in the last year or two, the last few years, is that more people are travelling together in boats to utilize the boats as much as possible and people are no longer going as far for the resources. It's just too expensive, where people use to make multiple trips they no longer do that, and you have to go out and stay and try to deal with what you got at $11.50 something a gallon, it is getting troublesome … I mean 23 years ago a lot of people came quite a ways up the Ambler looking for resources. And then, uh, in the last 10 it has backed off significantly. And now people stay maybe within the first 10 or 15 miles of the river. (ABL02020713)

Several people remarked on the high price of groceries. The University of Alaska Fairbanks Cooperative Extension Service (UAF CES) regularly collects this information in larger communities.[27] No food market survey information exists for the upper Kobuk communities. However, Division of Subsistence staff administered the UAF CES food market survey during fieldwork in Selawik in 2011. Results showed that the cost in Selawik to feed a family of 4 including 2 school-age children was 253% that of Anchorage in 2011.[28] Because Selawik receives barges more regularly and is closer to the regional hub, it is reasonable to assume that a similar study in Ambler would reveal an even higher cost relative to Anchorage.

Sociocultural Issues

A common concern expressed among survey respondents and in comments received was that young people receive a solid subsistence education as well an academic one. Remote villages were considerably less isolated from mainstream American society in 2012 than just a few decades prior. Children could watch cable or satellite television, browse the Internet, and play video games, much as their counterparts elsewhere in the United States. Respondents noted the changes in what young people know and do:

> All the kids knew how to hunt, they could all skin their own caribou and knock them apart, um, cutting fish, um, hauling firewood. All that stuff and that was, I made a point of them knowing how to do that and I said if things go to hell someday, you'll be able to provide for your family cause you know how to do this, you've done it. You can kill stuff, you can take care of it, and how to butcher caribou and stuff. And uh, I said the rest of what you learn how to do is fine for making a living, making your way, but if things change drastically some time you will have these skills to work with. But a lot of kids don't get that. (ABL07021013)

Table D2-16 presents additional survey comments:

> A big concern is that young people aren't getting out and doing it, not learning like they should. [It] is our responsibility to guide younger ones, [we] need to take young people out and teach them.
>
> Nobody cooks anymore. Need to teach people to go back to more subsistence so they're more capable. What are we going to do if kids don't learn, only drink juice and pop and food out of a box.

When asked, an elderly respondent named a series of things she wanted young people to know. These ranged from basic homemaking skills like sewing and cooking, to subsistence skills and knowledge, such

27. Division of Subsistence staff often complete the Cooperative Extension Service's food cost survey while in the field, although they did not do so during this project.

28. University of Alaska Fairbanks Cooperative Extension. Fairbanks, September 2011. "Cooperative Extension Service Food Cost Survey." Accessed February 6, 2012. http://www.uaf.edu/ces/hhfd/fcs/

as how to make a net, how to recognize a good place to seine, indicators of weather, and the best time to pick certain greens:

> I want them to learn how to sew, or learn how to make net, to start net. 'Cause I showed, from villages call me, "How do you start this net?" And I show them in my, you got everything in your hand, said "yeah." "You do it twice, you hold it, make a knot, half of it, that's it. And it start." She said, later on she call me, "It start, how many more feet?" I said, "How was your, ah, where you set net, how deep is it?" She tell me, "Okay, I know the length," and she make it. And she let her students work on it.
>
> I want them to learn how to go put net, look at the river, how deep is it, how dangerous is it, if they never tied their net good they gonna lose it. And where to go find eddy to go seining. You could stop and look at it. You could notice where the deepest part, and my kid telling my sisters, "Where to start?" "You see this current?" And this dark place, it go around. And it silver. That means it still water. Where the fish are. And pretty soon it jump. You could see something even. Or just nibble up, you could notice. Where to start. I want them to learn that. (ABL05021013)

The elder key respondents interviewed all demonstrated a willingness to pass on skills and knowledge to people who wanted to learn, even the researchers themselves.

Elizabeth Mikow

Plate 3-1.–Aerial view of Shungnak, March 2013.

3. SHUNGNAK

Elizabeth Mikow

Community Background

The community of Shungnak is located on the west bank of the Kobuk River, approximately 150 miles east of Kotzebue and 462 miles northwest of Anchorage (Plate 3-1). The village is in a transitional climate zone, with average temperatures ranging from -10°F to 15°F during the winter months and from 40°F to 65ºF in the summer. Annual snowfall averages 80 in, and the Kobuk River is generally free of ice from the end of May to the middle of October.[1]

Early Euro-American exploration in the area began when the Revenue Marine Service and the U.S. Navy undertook an expedition to the Kobuk River in 1885. Lt. George Stoney established a fort in the Cosmos Hills near the location of present-day Shungnak as a base for an overwintering expedition. Men from the expedition traded for Native clothing and patterned their houses after those of the Native population of the upper Kobuk. They also hired Alaska Native inhabitants to help move supplies and provide subsistence resources (Brown 1988:109). Stoney observed that residents of the upper Kobuk River region had been severely impacted by the caribou decline in the region as well as Western-borne epidemics of influenza that had devastated residents prior to Stoney's tenure (Brown 1988:115).

A short-lived gold rush to the Kobuk River in 1898–1899 brought hundreds of gold prospectors into the area (Brown 1988:199). Shungnak was originally settled in 1899 by miners who used the site as a supply point for mining activities in the Cosmos Hills, although the original location was 10 miles upstream at the site of present-day Kobuk (Stirling 1985:6). This settlement became the location of a trading post, a Friends mission, and school. These amenities, coupled with employment opportunities, prompted Native residents of the upper Kobuk River to settle there. Miners of the time noted the importance of Native knowledge of travel and hunting, and economic activity and employment opportunities were neither segregated nor

1. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed September 28, 2013. http://commerce.alaska.gov/cra/DCRAexternal/community

dominated by non-Native settlers (Brown 1988:211–212). By the end of the spring of 1898, a majority of the miners had left the region; only 10 prospectors remained on the upper Kobuk in 1910 (Stirling 1985:6). Lewis Lloyd, a local miner, did find productive placer deposits in the vicinity of Dahl Creek in 1909, and the few miners who remained were able to make a living wage (Brown 1988:323). As a consequence of continued mining activity, a very rudimentary travel and supply system remained, although the region was poorly served by transportation and communication provided by nonlocal mining interests (Stirling 1985:6). Reindeer herding spread from the Nome region soon after the establishment of Shungnak, and a herd was in place in the community from 1907 through the early 1940s. Reindeer herds across northwest Alaska grew in size and number until the 1930s. During that decade, reindeer populations declined, and caribou populations began to expand (Burch Jr. 2012:44). Caribou returned in substantial numbers to the Kobuk River valley in the late 1940s (Burch Jr. 1998:134) (Plate 3-2).

In 1927, flooding and erosion at the village site prompted a majority of the residents to relocate 10 miles downstream to the current location of the community (Magdanz et al. 2004:2). This new settlement was first called "Kochuk," but residents later renamed the community Shungnak. The few families that remained at the original site and those that chose to move back changed the name of their settlement from Shungnak to Kobuk in 1928 (Orth 1971rep.:534).

During the years between World War I and World War II, the upper Kobuk region was characterized by a minimal but stable cash economy, and the population remained low. The Native population had steadily increased in the region after World War I, and the presence of commercial, government, and missionary activity provided access to trading, health services, and schools (Brown 1988:392–393). Transportation improved in the community when significant territorial and local funding supported the construction of airfields, 1 of which was built in Shungnak (Brown 1988:388). The Alaska Road Commission also constructed the Kiana–Selawik–Shungnak trail for mail service in 1932 (Stirling 1985:7). Shungnak residents depended heavily on fur trapping for cash income, a practice that continued even after fur prices crashed in the 1930s.

Charles Crabaugh Papers (UAF 2010-0107-0000015), Archives, Alaska and Polar Regions Collections, University of Alaska, Fairbanks.

Plate 3-2.–Hunter stands in front of meat cache near Shungnak in the late 1940s.

In the decades following World War II, Shungnak residents experienced continuing political and economic changes. Archaeologist Louis Giddings visited the upper Kobuk region in the 1940s and noted that a difficult economic climate had led to a greater reliance on traditional subsistence practices. Although some residents had left the Kobuk River valley because of the declining caribou presence, those who did stay were able to endure difficult times due to the relative diversity of resources in the surrounding area (Brown 1988:393–394). In 1947, the acting commissioner of Indian Affairs proposed the creation of reservations in Alaska because of concerns over the need to protect Native hunting, fishing, and trapping economies from Euro-American settlers. A 2,300 square mile reservation for Shungnak and Kobuk was included among a list of proposed reservations, and remained a proposal for several years. Native residents of Kobuk and Shungnak were concerned about repeating the negative history of American Indian populations in the contiguous U.S., and in 1950, they voted against the proposed reservation by a large margin (Mitchell 1997:299–302). In the 1950s, the Kennecott Corporation renewed its interest in the Bornite mine copper deposits located on the Ruby River near Shungnak. Development included the creation of another airstrip, the building of roads, and increased barge traffic to the region (Brown 1988:582).

The city government of Shungnak was officially incorporated in 1967, and there is a federally recognized tribe in the community. The community is predominately Inupiaq; an estimated 91% of residents are Alaska Native. Shungnak has its own water treatment facility, and most homes are connected to a piped sewage system. There is 1 school, 1 store, and a health clinic located in Shungnak. The village is accessible by scheduled air service and barge, and there are trails along the river used for intervillage travel.[2]

Seasonal Round

Subsistence activities vary with the seasons and the timing of resource availability. The following description of the seasonal subsistence round in Shungnak comes largely from key respondent interviews conducted in the community during data collection. Contemporary information from the interviews highlights how and when resources were harvested. Respondents also shared historical information, which illustrates changes to subsistence practices. A more detailed description of the historical seasonal round for the upper Kobuk River region can be found in the introduction of this report as well as in a number of other sources including Anderson et al. (1977), Burch Jr. (1975), Burch Jr. (1988), and Heller and Scott (1967).

In early spring, prior to breakup, residents hunt for caribou and prepare themselves for the coming summer. Although caribou are harvested throughout much of the year, March and April are months of increased hunting activity "because during the spring or spring breakup, we're not going to see any of that caribou around our area" (SHG06030513). Caribou become much less accessible during breakup in May, and residents are anxious to put fresh meat in the freezers before that time. Residents begin hunting migratory birds in late April and early May as the spring season progresses. Geese are the first to arrive in the area, followed by ducks (SHG06030513; SHG01030613). In the past, Shungnak residents would also gather eggs in the spring, but respondents indicated that this practice has declined within their lifetimes (SHG01030613; SHG02030713). In May, hunters often combine hunting for birds with targeting beaver and muskrats (SHG02030713; SHG06030513; SHG03071813). Hunters target bears in spring as they emerge from their dens, when they have "only berry fat in them" before they start eating salmon (SHG03071813; SHG01030613).

As spring progresses to summer, residents shift their focus to fishing. As soon as the river breaks up around mid-May, residents place setnets and use seines to catch fish from successive runs. The first catches are whitefish species, which continue to be a focus of fishing throughout the summer and fall months (SHG06030513). The first fish to move out of lakes and into the river are broad whitefish, followed by humpback whitefish (Georgette and Shiedt 2005). Residents also gather sourdock, or *quagaq*, in June when

2. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed September 28, 2013. http://commerce.alaska.gov/cra/DCRAexternal/community

the first small leaves appear on the plants (SHG06030513). Sheefish arrive in July, and residents harvest them with rod and reel as well as with setnets and seines. Fishers often catch sheefish in the nets used to target other whitefish species and salmon throughout the summer and into the fall months (SHG03071813; SHG06030513; SHG01030613). Salmon begin running by the village in late July or early August; the vast majority are chum salmon. One key respondent explained how her mother would know that the salmon were on their way by watching for environmental indicators: "And my mom would say 'The salmon are coming!' I say, 'How you know?' [She replied,] 'See these little green bugs?'" (SHG01071913). Families in the community work together in camps near town to catch the salmon with either setnets or seines. They also dry their catch as a collective effort (SHG03071813; SHG06030513; SHG01030613; SHG01071913). Other species of fish are caught incidentally in setnets used to target salmon, including longnose suckers, northern pike, trout, and Arctic grayling (SHG06030513).

As the late summer progresses to autumn, residents turn their attention to harvesting a variety of plants, beginning with berries. Salmonberries ripen first, around mid-July. Residents pick them quickly after they ripen and before "they spoil" on the plant (SHG06030513). In late July and early August, the focus of berry picking moves to blueberries. Some residents gather stinkweed, or *sagriq*, in August when the plants are fully grown. Interestingly, 1 respondent explained that it is possible to harvest stinkweed in the wintertime. Stinkweed can be visible through the snow, and "it's already dry in the winter," so it can be used right away without preparation (SHG06030513). Residents harvest Hudson's Bay (Labrador) tea and Eskimo potatoes, or *masru*, in the late summer and early fall months. In September, they pick cranberries and crowberries, or blackberries as they are called locally.

From late summer to freeze-up, residents continue fishing activities; they target whitefishes and sheefish once again as the salmon runs come to a close (SHG06030513; SHG05071713). Especially in the fall, Shungnak hunters target large game including caribou, moose, and bears. Once the ice hardens, a few residents of Shungnak place nets under the ice to target broad whitefish, while other residents set burbot traps (SHG01071913; SHG06030513; SHG02030713). Fishers jig for burbot, northern pike, and Arctic grayling after freeze-up. October and November are the prime months for jigging, although it does continue into the winter months. Jigging is also a main subsistence activity in the late winter and early spring as the days get longer and the temperatures rise (SHG07071913; SHG06030513; SHG03071813). Although often taken opportunistically, hunters sometimes target wolves in the winter (SHG03071813). Finally, hunters also harvest nonmigratory birds, such as ptarmigan, during the winter months.

Population Estimate and Demographic Information

Figure 3-1 illustrates the population history of Shungnak from 1950 to 2012, drawing upon decennial estimates from the U.S. Census Bureau (portrayed as blue dots) and the yearly estimates provided by the Alaska Department of Labor (portrayed as white dots). According to these data, the population of Shungnak has grown steadily over the past 60 years. As a point of comparison to this study's population estimate of 275 (portrayed by the red square), the Alaska Department of Labor and Workforce Development (ADLWD) estimate for 2012 was 269 individuals[3]; the estimates are very close, differing by only 2%. Reasons for this slight difference can be explained by a number of factors, including differences in survey timing, definitions of residency, and sampling strategies.

The 46 surveyed households included 183 people (Table 3-1). Expanding for the 23 unsurveyed households, the estimated population of Shungnak at the time of the survey was 275 individuals. Household sizes ranged from 1 to 9 people and averaged 4 people per household. The average age was 28; the oldest person included in the sample was 86 years of age. On average, Shungnak residents had lived in the community for 23 years (Table 3-1), and 66% of household heads were born in Shungnak (Table D3-1). Other reported birthplaces were communities in northwest Alaska, including the neighboring communities of Ambler (4%) and Kobuk

3. ADLWD (Alaska Department of Labor and Workforce Development) Research and Analysis Section, Juneau. n.d. "Population Estimates—Places and Other Areas: Cities and Census Designated Places (CDPs), 2010–2013." Accessed September 28, 2013. http://laborstats.alaska.gov/pop/popest.htm

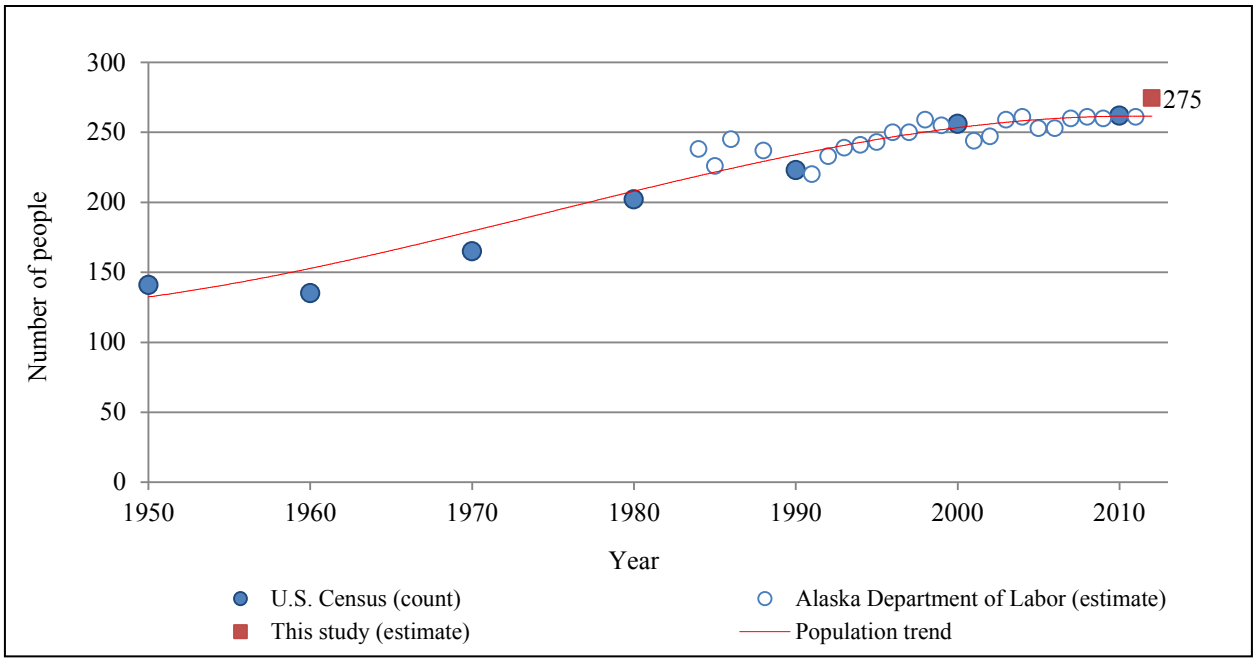

Figure 3-1.–Historical population estimates, Shungnak, 1950–2012

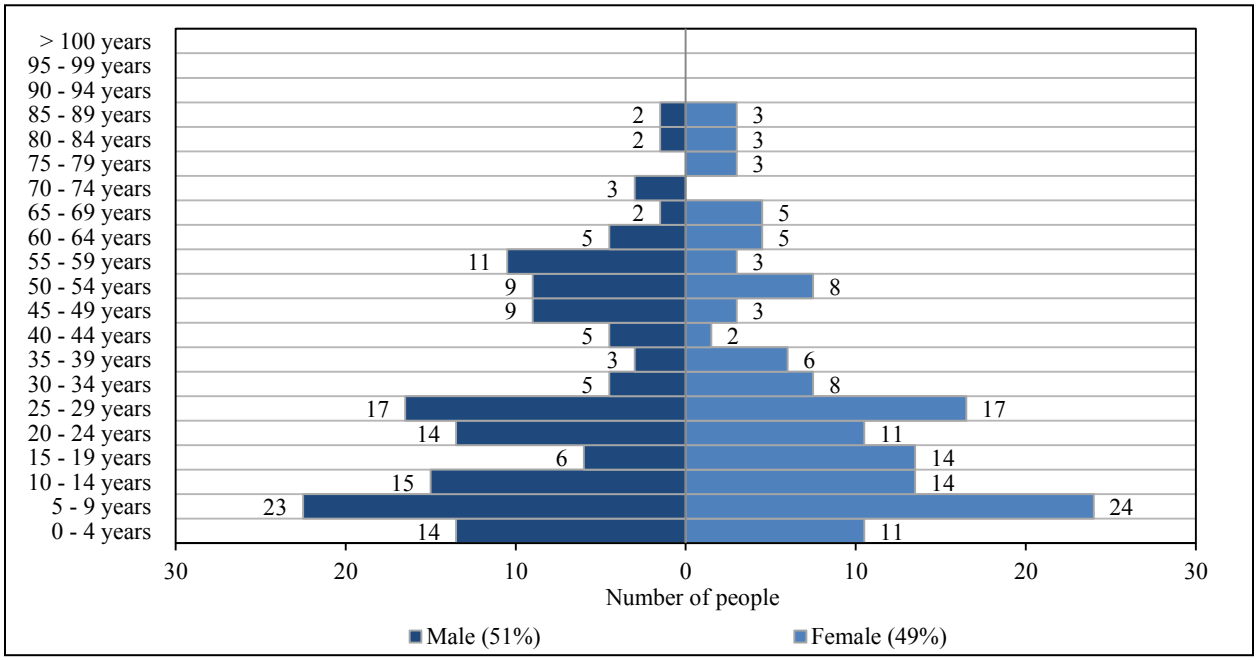

Figure 3-2.–Population profile, Shungnak, 2012.

Table 3-1.–Demographic and sample characteristics, Shungnak, 2012.

Characteristics	Community Shungnak
Sample achievement	
Sampled households	46
Eligible households	69
Percentage sampled	66.7%
Sampled population	183
Estimated population	274.5
Household size	
Mean	4.0
Minimum	1
Maximum	9
Age	
Mean	28.4
Minimum	0
Maximum	86
Median	24
Sex	
Estimated male	
Number	139.5
Percentage	50.8%
Estimated female	
Number	135.0
Percentage	49.2%
Length of residency	
Population	
Average	23.4
Minimum	0
Maximum	86
Household heads	
Average	38.5
Minimum	0
Maximum	86
Alaska Native	
Estimated households	
Number	54.0
Percentage	78.3%
Estimated population	
Number	250.5
Percentage	91.3%

Source ADF&G Division of Subsistence household surveys, 2013.

Table 3-2.–Estimated earned and other income, Shungnak, 2012.

Income source	Number of people	Number of households	Total for community	Mean per household[a]	Percentage of total[b]
Earned income					
Local government	30.0	28.2	$1,098,451	$15,920	26.7%
Services	25.5	22.0	$908,191	$13,162	22.0%
Mining	18.0	14.1	$463,798	$6,722	11.3%
Construction	4.5	4.7	$135,046	$1,957	3.3%
Transportation, communication, and utilities	6.0	6.3	$112,568	$1,631	2.7%
Retail trade	3.0	3.1	–	–	–
Federal government	3.0	3.1	–	–	–
State government	1.5	1.6	–	–	–
Other employment	1.5	1.6	–	–	–
Earned income subtotal	**90.3**	**54.9**	**$2,936,955**	**$42,565**	**71.3%**
Other income					
Native corporation dividend		51.0	$274,829	$3,983	6.7%
Food stamps		22.5	$231,729	$3,358	5.6%
Alaska Permanent Fund dividend		55.5	$201,435	$2,919	4.9%
Social Security		9.0	$145,350	$2,107	3.5%
Energy assistance		31.5	$107,316	$1,555	2.6%
Pension/retirement		10.5	$70,993	$1,029	1.7%
Workers' compensation/insurance		3.0	$65,412	$948	1.6%
Other		7.5	$24,750	$359	0.6%
Unemployment		13.5	$20,379	$295	0.5%
CITGO fuel voucher		36.0	$18,000	$261	0.4%
Supplemental Security income		1.5	–	–	–
Adult public assistance		1.5	–	–	–
Foster care		1.5	–	–	–
Longevity bonus		1.5	–	–	–
TANF (temporary cash assistance for needy families)		0.0	$0.0	$0.0	$0.0
Child support		0.0	$0.0	$0.0	$0.0
Disability		0.0	$0.0	$0.0	$0.0
Veterans assistance		0.0	$0.0	$0.0	$0.0
Meeting honoraria		0.0	$0.0	$0.0	$0.0
Other income subtotal		**63.0**	**$1,182,921**	**$17,144**	**28.7%**
Community income total			**$4,119,876**	**$59,708**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2013.
Note "–" indicates that for confidentiality, income amounts are not listed for sources reported by fewer than 4 persons or households.
a. Means are based on all households in the community, not the number of households in the income category.
b. Income by category as a percentage of the total community income from all sources (wage-based income and non-wage-based income).

(3%), Selawik (3%), and Kotzebue (3%). A full list of birthplaces of household heads can be found in Table D3-1. During the study year, an estimated 91% of the population of Shungnak was Alaska Native. Figure 3-2 portrays the population profile of the community; the profile is characterized as a relatively young population. In 2012, a majority of the population was under the age of 30, and the largest cohort was in the 5–9 year range. According to the profile, 51% of residents were male and 49% were female.

Income and Cash Employment

Respondents were asked about income earned from jobs by all household members 16 years old and older as well as income from other sources such as the Alaska Permanent Fund dividend, Social Security, and public assistance. The survey also asked about months worked and the work schedule for each job. In 2012, Shungnak households earned or received an estimated $4.1 million, of which approximately $2.9 million (71%) was from earned income and approximately $1.2 million (29%) was from other sources (Table 3-2).

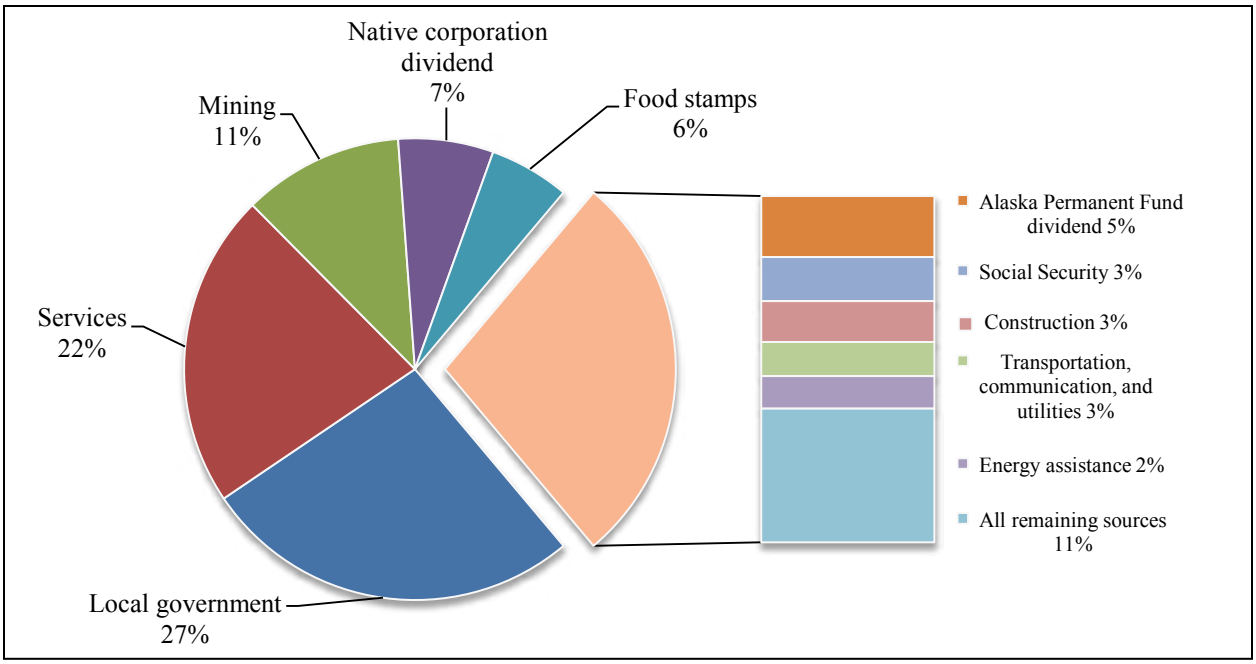

Figure 3-3.–Top 10 income sources, Shungnak, 2012.

The total earned income estimated by this survey ($2.9 million) is slightly higher (23%) than the ADLWD estimate of $2.3 million in wages in 2012.[4] The median household income for Shungnak in 2012 was $50,091 (Table D3-2); the median household income estimated by this study is nearly identical to the 2008–2012 median for the community of $50,000 (Table 3-2; Table D3-2).[5] According to this study's estimates for 2012, the median household income in Shungnak ($50,091) was slightly lower than the estimated median income for Ambler households ($52,757) and slightly higher than for Kobuk households ($41,878) (Table D2-2; Table D4-2). Estimated per capita income in the community was $15,009 in 2012 (Table D1-1).

Figure 3-3 shows the top 10 estimated sources of income. The largest source of income was local government jobs, which included city and tribal government occupations and schools. This category accounted for 27% of all income in Shungnak, an estimated $1,098,451 in wages (Table 3-2). Services, which included health care and social service jobs, was the second largest employment category; jobs in this category accounted for $908,191 in wages and 22% of the local cash economy. Employment in the mining industry accounted for 11% of Shungnak's total income—an estimated $463,798. Other important sources of money in the community came from other income, including Native corporation dividends ($274,829 or 7%), food stamps ($231,729 or 6%), the Alaska Permanent Fund dividend ($201,435 or 5%), and Social Security ($145,350 or 3%).

A slight majority (51%) of people aged 16 and older were employed for some period of time during the study year (Table D3-3). Reported job schedule data identified 77% of employed persons who disclosed a schedule type had a full-time schedule and 9% had an on-call schedule (Table D3-4). The average number of jobs per household was 2, with a maximum of 4 jobs held by 1 household (Table D3-3). Workers were employed an average of 8 months out of the study year, which indicates a high rate of seasonal employment. Additional information on employment characteristics and schedules can be found in Appendix D (Table D3-3; Table D3-4).

4. ADLWD (Alaska Department of Labor and Workforce Development) Research and Analysis Section, Juneau. n.d. "Alaska Local and Regional Information: Shungnak city." Accessed September 28, 2013. http://live.laborstats.alaska.gov/alari/index.cfm
5. U.S. Census Bureau American Community Survey, Washington, D.C., n.d. "American Factfinder: Shungnak city." Accessed September 28, 2013. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

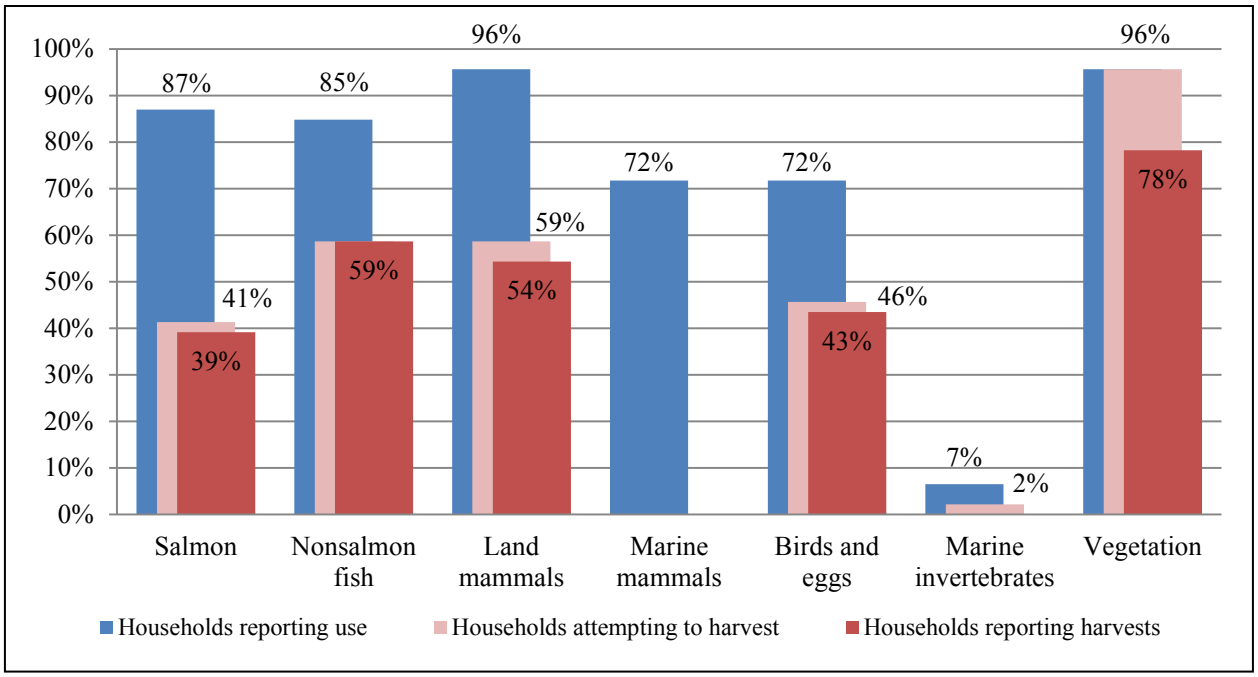

Figure 3-4.–Percentages of households using, attempting to harvest, and harvesting wild resources by category, Shungnak, 2012.

Summary of Harvest and Use Patterns in 2012

Table D3-5 summarizes resource harvest and use characteristics for Shungnak in 2012 at the household level. All households in the community used and harvested wild resources during the study year. The average harvest was 1,462 lb of edible weight per household. The per capita harvest was 368 lb. During the study year, households harvested an average of 7 kinds of resources and used an average of 13 kinds of resources. The maximum number of resources used by any household was 27. In addition, households gave away an average of 5 kinds of resources, and 87% of households reported giving resources to other households.

Figure 3-4 shows, by resource category, how many households used, attempted to harvest, or harvested wild foods. The most widely used resource categories by Shungnak households during the study year were land mammals and vegetation (96% for both resource categories). Although the same percentage of households used these resource categories, the percentage of households attempting to harvest and successfully harvesting these resources differs dramatically: 96% of households attempted to harvest and actually harvested vegetation resources, while 59% of households attempted to harvest land mammals, and 54% of households in Shungnak successfully harvested them. Overall, with the exception of vegetation, the use of resource categories was significantly greater than the percentage of households attempting to harvest or actually harvesting resources. This was particularly evident for marine mammals, which were used by 72% of households with no reported harvest. The discrepancy between use and harvest levels likely speaks to networks of sharing, customary trade, and barter that are common in rural Alaska subsistence economies and will be discussed in greater detail below.

Resource Harvests and Uses by Category

The 46 surveyed households in Shungnak harvested 66,261 lb of wild foods between February 1, 2012 and January 31, 2013 (known as the 2012 study year). Expanding for unsurveyed households, Shungnak harvested an estimated 100,872 lb (± 30%) of wild foods, or about 368 lb per capita (Table D3-5).

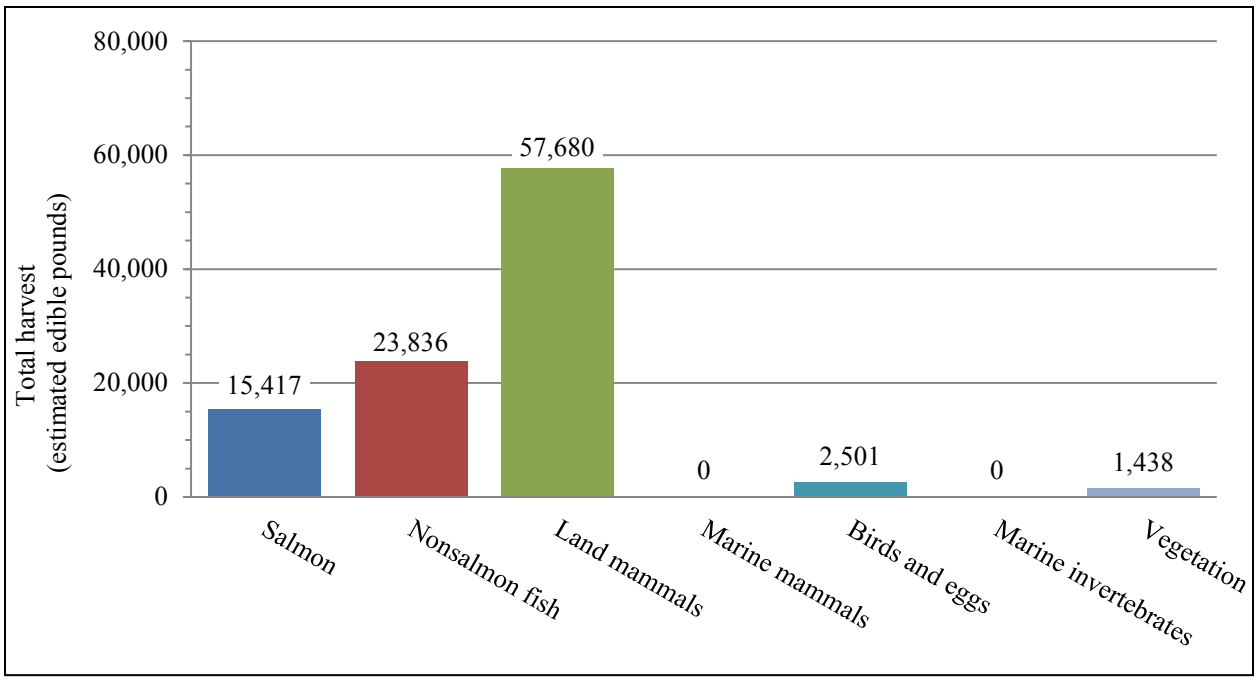

Figure 3-5.–Total harvest in estimated edible pounds, by resource category, Shungnak, 2012.

Land mammals contributed the most edible weight (57%) to Shungnak's 2012 harvest; this category provided 57,680 lb, or 210 lb per capita (Figure 3-5; Table 3-1). Salmon and nonsalmon fish species were the second and third largest contributors to the community's overall harvest; nonsalmon species provided 22,813 lb (23% of the total estimated harvest), or 87 lb per capita, and salmon contributed an additional 15,417 lb (15%), or 56 lb per capita. Shungnak residents also harvested birds and eggs, which contributed 2,501 lb to the total estimated harvest and accounted for about 2% of the harvest, or 9 lb per capita. Finally, vegetation resources contributed 1,438 lb of edible weight (1%) or 5 lb per capita. While respondents reported using marine mammals and marine invertebrates during the study year, there was no harvest of these resources in Shungnak during the study year.

Resource Harvests and Uses by Species

Figure 3-6 lists the top 10 resources harvested, in terms of total pounds harvested, by Shungnak households during the 2012 study year. All harvested resource categories were represented in the top 10 resources during the study year. Caribou contributed the most to the community's total harvest; caribou harvests provided 53% of the total harvest by weight. Another 37% of the harvest came from these fish species: sheefish (17%), chum salmon (15%), broad whitefish (3%), humpback whitefish (1%), and least cisco (1%). Moose accounted for 2% of the total subsistence harvest; beaver, blueberries, and white-fronted geese each accounted for 1% of the harvest.

Tables 3-3 through 3-8 report estimated harvests and uses of wild resources by Shungnak residents in 2012; each table represents a resource category and is organized by species. Resource harvest estimates are reported in pounds of edible weight and by number of individuals (see Appendix C for conversion factors[6]). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources taken, given away, or used by any member of a household, as well as resources acquired from other harvesters either as gifts, by barter or trade, or through hunting partnerships. Differences between harvest and use percentages reflect exchange among households, which results in a wider distribution of wild foods and other subsistence resources.

6. Resources that are not eaten, such as firewood and some furbearers, are included in the table but are given a conversion factor of zero.

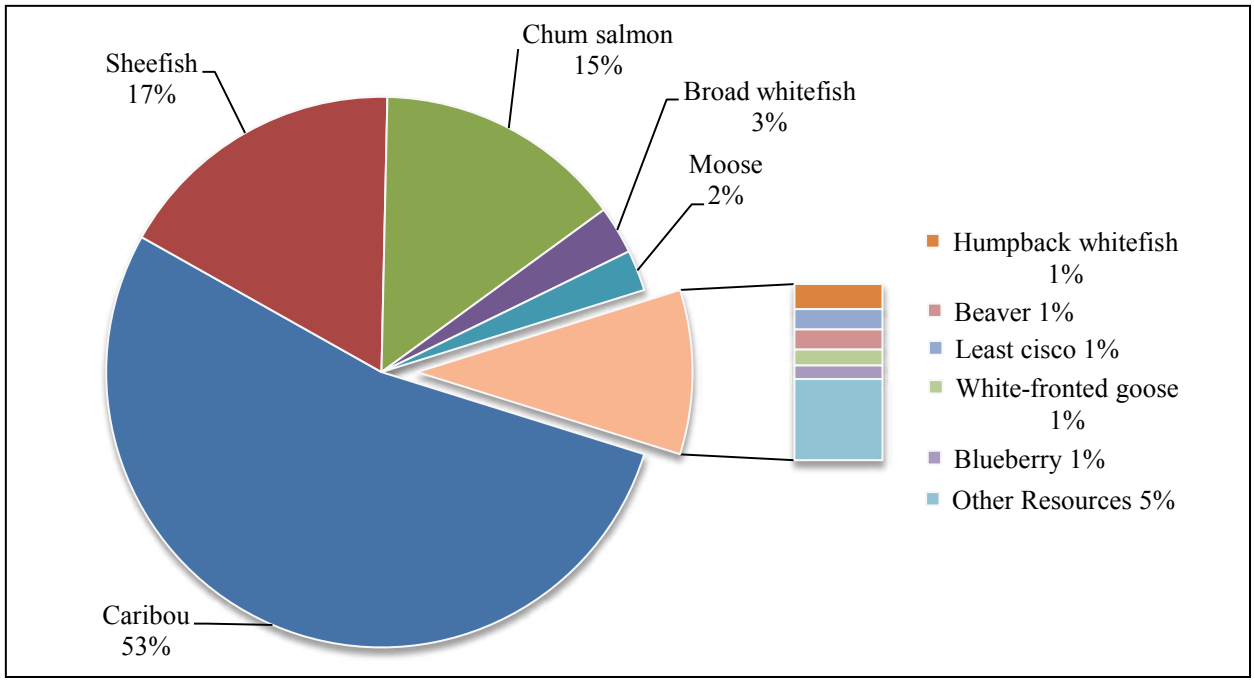

Figure 3-6.–Top 10 species harvested, ranked by estimated edible weight, Shungnak, 2012.

Figure 3-7 depicts harvest and use areas used by Shungnak residents in the pursuit of all resources: a total area of 1,073 square miles. Residents reported continuous search and harvest areas along the mainstem of the Kobuk River from the vicinity of Ambler upstream to the confluence of the Pah River. Other areas included the foothills of the Baird Mountains and various sections of the Kobuk River from approximately 40 miles downstream from Ambler to upstream of the confluence of the Pah River. Search and harvest areas for individual resources categories will be discussed in each section below.

Salmon

As mentioned above, salmon composed 15% of the total estimated harvest for Shungnak and accounted for 39% of the harvest of fish species in 2012. Fewer households may have used salmon in 2012 (87%) than in other years due to poor fishing conditions, a topic which will be discussed in greater detail below. Chum salmon was the most heavily used and harvested salmon species in Shungnak in 2012; chum salmon accounted for 96% (14,747 lb) of the total salmon harvest during the study year and contributed the greatest number of edible pounds per capita of any salmon species (54 lb per person) (Table 3-3). Although chum salmon was the most widely used salmon species (78%), only 37% of households harvested chum salmon during the study year; this is likely explained by the high incidence of sharing of chum salmon in the community (65% of households received this resource and 30% gave it away). Sockeye salmon accounted for 4% of the total salmon harvest (540 lb) and was used by 11% of Shungnak households. Neither sockeye, nor coho, nor Chinook salmon were found in the Kobuk River; residents harvested these species elsewhere. Small numbers of pink salmon were found in the upper Kobuk River. Residents harvested a limited quantity of pink salmon (33 lb), and fewer than 5% of households used pink salmon. One respondent explained that the presence of pink salmon in the river may indicate a strong chum salmon run: "When there is a lot of salmon coming, the humpback salmon [pink salmon] will be first to come and then we'll know we have a good salmon run, when those humpback salmon come first" (SHG06030513).

Chum salmon also contributed the largest amount of fish by weight used as dog food in 2012—an estimated 4,560 lb (58% of the fish used to feed dogs) (Table D3-6). No other salmon species was used for this purpose, likely because of the relative absence or low numbers of other salmon species in the Kobuk River drainage. The number of chum salmon used to feed dogs may have been inflated during the study year.

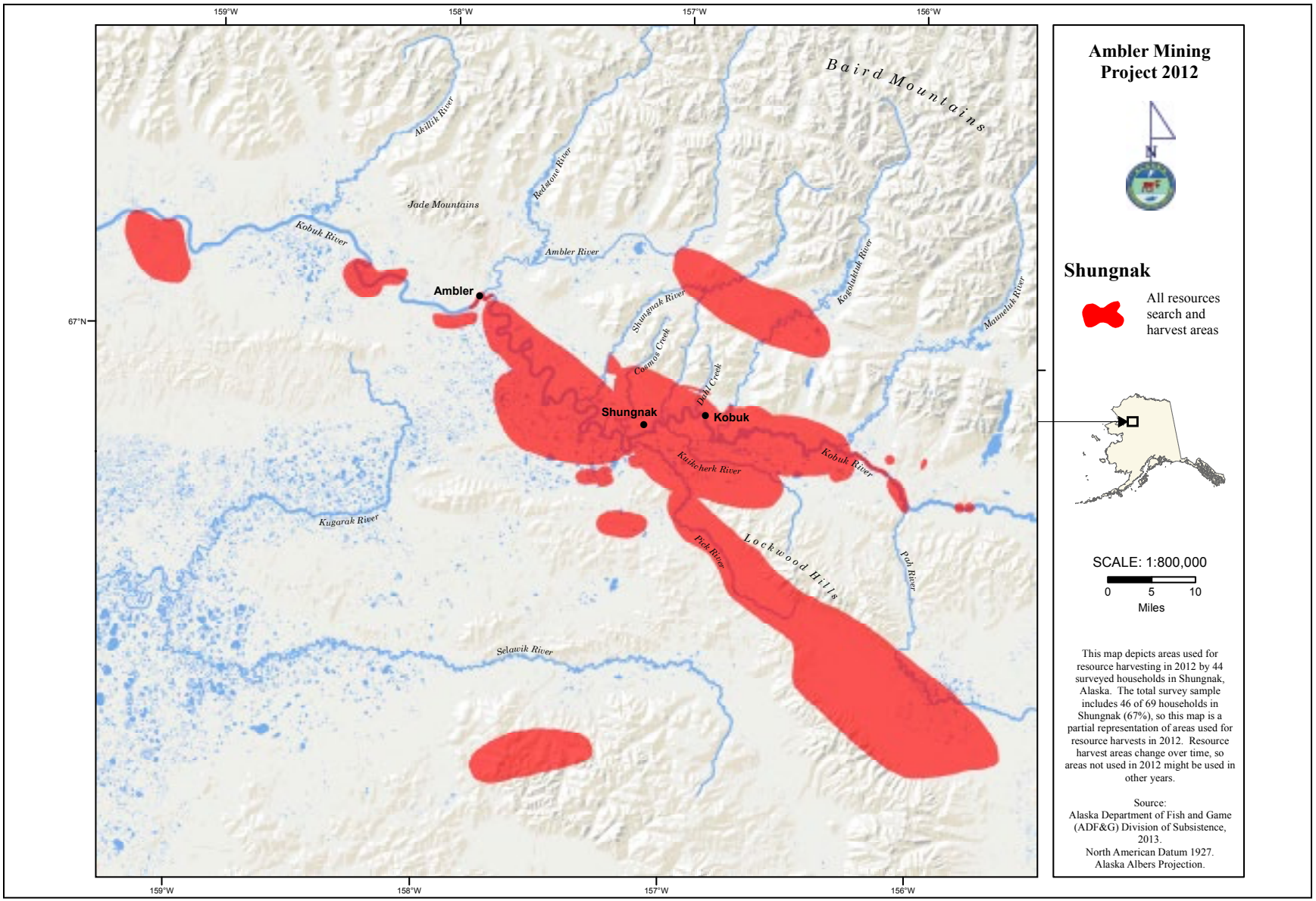

Figure 3-7.–All resources search and harvest areas, Shungnak, 2012.

Table 3-3.–Estimated harvest and use of salmon and nonsalmon fish, Shungnak, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Fish										
Salmon										
Chum salmon	78.3%	39.1%	37.0%	65.2%	30.4%	14,747.4 lb	213.7 lb	53.7 lb	2,595.0 ind	± 34%
Coho salmon	8.7%	4.3%	2.2%	6.5%	4.3%	96.9 lb	1.4 lb	0.4 lb	15.0 ind	± 116%
Chinook salmon	6.5%	2.2%	0.0%	4.3%	4.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Pink salmon	4.3%	4.3%	2.2%	0.0%	4.3%	32.7 lb	0.5 lb	0.1 lb	9.0 ind	± 116%
Sockeye salmon	10.9%	4.3%	2.2%	6.5%	8.7%	540.0 lb	7.8 lb	2.0 lb	90.0 ind	± 116%
Unknown salmon	2.2%	0.0%	0.0%	2.2%	2.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**87.0%**	**41.3%**	**39.1%**	**71.7%**	**39.1%**	**15,417.0 lb**	**223.4 lb**	**56.2 lb**	**2,709.0 ind**	**± 32%**
Char										
Dolly Varden	19.6%	19.6%	17.4%	2.2%	6.5%	326.7 lb	4.7 lb	1.2 lb	99.0 ind	± 61%
Lake trout	2.2%	2.2%	2.2%	0.0%	0.0%	6.0 lb	0.1 lb	0.0 lb	1.5 ind	± 116%
Subtotal	**19.6%**	**19.6%**	**17.4%**	**2.2%**	**6.5%**	**332.7 lb**	**4.8 lb**	**1.2 lb**	**100.5 ind**	**± 60%**
Whitefishes										
Sheefish	82.6%	56.5%	56.5%	60.9%	47.8%	17,334.3 lb	251.2 lb	63.1 lb	1,556.0 ind	± 32%
Broad whitefish	41.3%	17.4%	13.0%	32.6%	19.6%	2,841.6 lb	41.2 lb	10.4 lb	888.0 ind	± 81%
Bering cisco	4.3%	4.3%	2.2%	4.3%	2.2%	105.0 lb	1.5 lb	0.4 lb	75.0 ind	± 116%
Least cisco	6.5%	6.5%	4.3%	2.2%	4.3%	1,125.0 lb	16.3 lb	4.1 lb	1,125.0 ind	± 90%
Humpback whitefish	15.2%	8.7%	6.5%	10.9%	4.3%	1,386.0 lb	20.1 lb	5.0 lb	660.0 ind	± 106%
Round whitefish	8.7%	4.3%	2.2%	8.7%	2.2%	21.0 lb	0.3 lb	0.1 lb	30.0 ind	± 116%
Unknown whitefishes	2.2%	2.2%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**84.8%**	**58.7%**	**58.7%**	**69.6%**	**47.8%**	**22,812.9 lb**	**330.6 lb**	**83.1 lb**	**4,334.0 ind**	**± 41%**
Anadromous/marine fish										
Pacific herring	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Smelt	2.2%	0.0%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Saffron cod	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**2.2%**	**0.0%**	**0.0%**	**2.2%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0**	**± 0%**
Other fresh waterfish										
Burbot	13.0%	4.3%	4.3%	8.7%	4.3%	207.9 lb	3.0 lb	0.8 lb	49.5 ind	± 106%
Arctic grayling	23.9%	19.6%	19.6%	10.9%	13.0%	359.1 lb	5.2 lb	1.3 lb	399.0 ind	± 47%
Northern pike	13.0%	10.9%	10.9%	4.3%	2.2%	123.8 lb	1.8 lb	0.5 lb	37.5 ind	± 56%
Subtotal	**34.8%**	**26.1%**	**26.1%**	**19.6%**	**17.4%**	**690.8 lb**	**10.0 lb**	**2.5 lb**	**486.0 ind**	**43%**
All fish	**91.3%**	**63.0%**	**63.0%**	**84.8%**	**63.0%**	**39,253.4 lb**	**568.9 lb**	**143.0 lb**		**± 34%**
All resources	**100.0%**	**100.0%**	**100.0%**	**97.8%**	**87.0%**	**100,872.3 lb**	**1,461.9 lb**	**367.5 lb**		**± 30%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

Several respondents noted that heavy rains during the summer and fall fishing seasons made drying fish difficult, particularly salmon (SHG01071913; SHG06030513; SHG03071813); some even explained that their households fed the chum salmon they caught for family consumption to dogs because the fish spoiled (SHG06030513; SHG03071813).

Indeed, a particularly rainy summer and fall in the upper Kobuk River area created challenges for residents beyond just fish preservation. Respondents in Shungnak noted that high water on the river made fishing conditions unfavorable and led to lower harvests (SHG03071813; SHG01071913; SHG06030513; SHG01030613). One respondent explained that placing his net in fast-moving eddies was problematic because driftwood and other debris became entangled in the net (SHG03071813). These conditions impacted fishing not only for chum salmon, but also for other fish species harvested in the summer and fall months. When asked about changes to the salmon run, several respondents noted a gradual decrease over the years

in the number of chum salmon available for harvest. Despite the decline in numbers, respondents agreed that the overall health of harvested salmon was generally good (SHG0719131.1; SHG0306013).

Elizabeth Mikow

Plate 3-3.–Rod and reeling for sheefish is a common subsistence pursuit during the summer months in Shungnak.

Nonsalmon Fish

Whitefish species composed 96% of the harvest of nonsalmon fish species in Shungnak during the study year, and whitefishes accounted for 58% of the total fish harvest (Table 3-3). Three whitefish species contributed the most edible weight to the total estimated harvest, and all 3 were present in the top 10 most harvested resources (Figure 3-6). Sheefish contributed 17,334 lb (63 lb per capita) to the whitefishes harvest and accounted for 76% of it. This resource was also the most widely used and harvested fish species during the study year: 83% of households used sheefish, and 57% harvested it. Sheefish was also extensively shared in the community; 61% of households received the resource, and 48% gave it away. Broad whitefish contributed 2,842 lb (10 lb per capita), and humpback whitefish contributed 1,386 lb (5 lb per capita); these 2 species accounted for 19% of Shungnak's whitefishes harvest during the study year.

Residents noted that environmental conditions hampered Shungnak residents' harvest of whitefish species during the study year. Conditions for setting gillnets for whitefishes were favorable early in the season, but later they deteriorated:

> I remember when the sheefish first started running, the first—the beginning of the fish—I caught about 20 and that was just about it. And after that I didn't catch nothing for the rest of the year because of that high water. (SHG01071913)

Respondents indicated that rainy conditions also made drying whitefishes difficult (SHG06030513; SHG03071813). A few households in Shungnak fish under the ice for whitefishes after freeze-up, and 1 respondent explained that environmental conditions in 2012 made this difficult: he had to pull his net out after only 1 week because there was "too much ice flowing under the river" (SHG010306013).

Respondents shared varying opinions about changes in the size of whitefish populations; some felt numbers of these fish had decreased over the course of their lifetimes, while others felt the population was generally stable (SHG07071913; SHG06030513; SHG01030613; SHG03071813). One respondent indicated that she had concerns over the health of broad and humpback whitefishes caught in the early summer after breakup; she explained that they used to be "just white with fat" but are now thinner (SHG07071913).

Shungnak residents reported harvesting limited quantities of other nonsalmon fish species, which collectively contributed 3% to the total fish harvest during the study year. Arctic grayling was the most used of these species (24% of households) and the most harvested, providing 359 lb (1 lb per capita) of edible weight. Households reported limited use and harvest of burbot, Dolly Varden, lake trout, and northern pike.

Of the nonsalmon fish species, whitefishes were the most widely used for dog food in Shungnak in 2012 by contributing 42% (3,325 lb) of the fish used for this purpose. Of the whitefish species, sheefish contributed the most edible weight used to feed dogs (2,812 lb). Shungnak residents also reported limited use of other

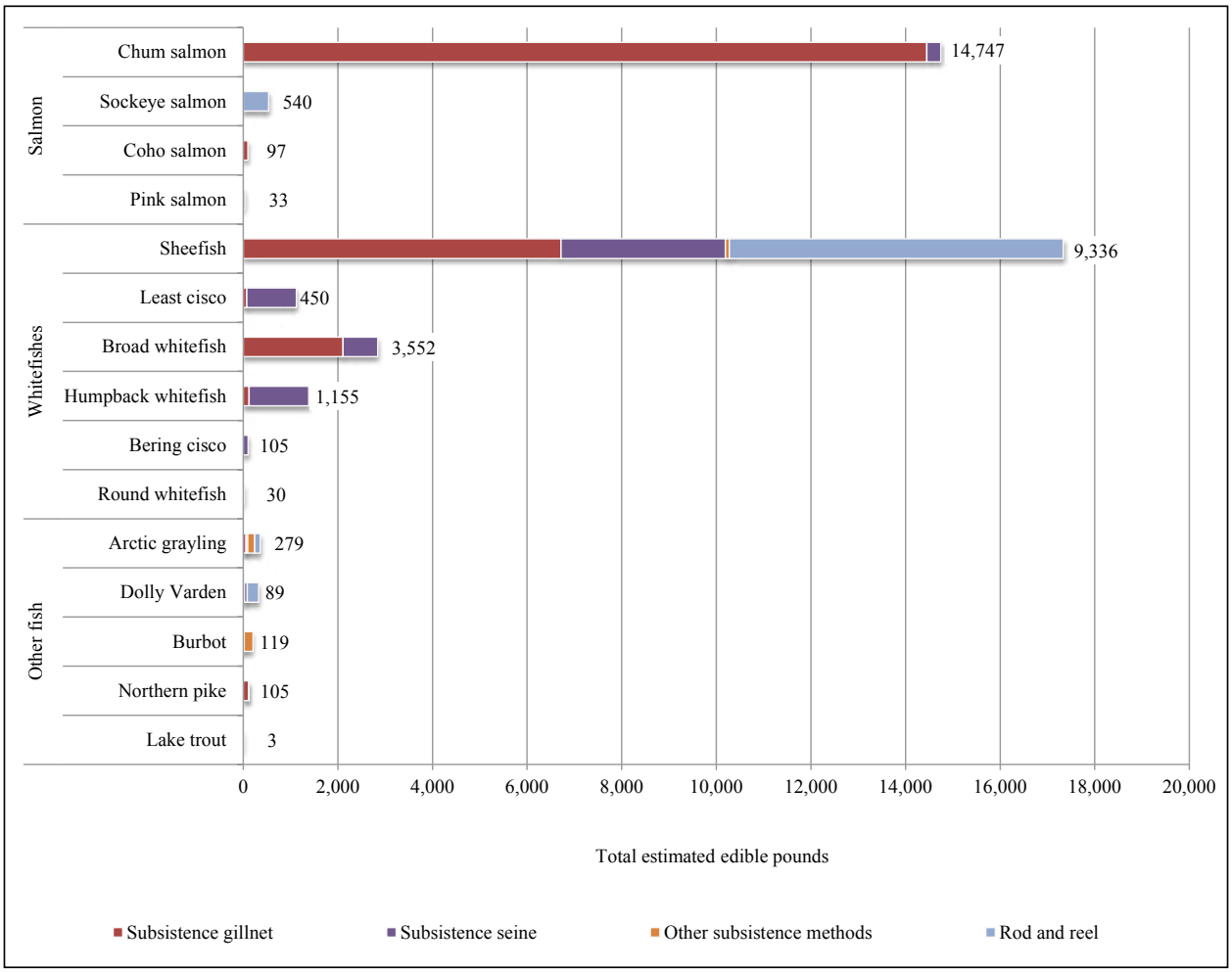

Figure 3-8.–Salmon and nonsalmon fish harvest by gear type, Shungnak, 2012.

nonsalmon fish for dog food, including humpback whitefish, least cisco, lake trout, northern pike, Dolly Varden, and Arctic grayling (Table D3-6).

Fishing Gear and Harvest Locations

Fishing gear used by Shungnak residents and areas of harvest in 2012 varied for specific species and times of year. Residents harvested 98% of all chum salmon with setnets, and they caught the remaining 2% with seines. Shungnak residents reported limited harvest of pink salmon, which they harvested with setnets. Residents harvested all coho salmon with setnets and all sockeye salmon with rod and reel (Figure 3-8).

Salmon search and harvest areas in 2012 extended intermittently along the mainstem of the Kobuk River from approximately 10 miles downriver from Shungnak at the mouth of Cosmos Creek to approximately 30 miles upriver from the community near the confluence of the Mauneluk River (Figure 3-9). The largest continuous search area in 2012 was the mainstem Kobuk River from Shungnak upriver to the community of Kobuk.

Shungnak residents harvested 40% of their whitefishes catch by setnet, 31% by rod and reel, and 30% by seine. Fishers showed preference for setnets in harvesting broad whitefish (74% of the broad whitefish catch). They used seines to catch the majority of humpback whitefish (91% of the humpback whitefish catch), least cisco (93%), round whitefish (100%), and Bering cisco (100%). Fishers harvested 41% of the sheefish catch by rod and reel, 39% by setnet, and 20% by seine (Figure 3-8; Plate 3-3).

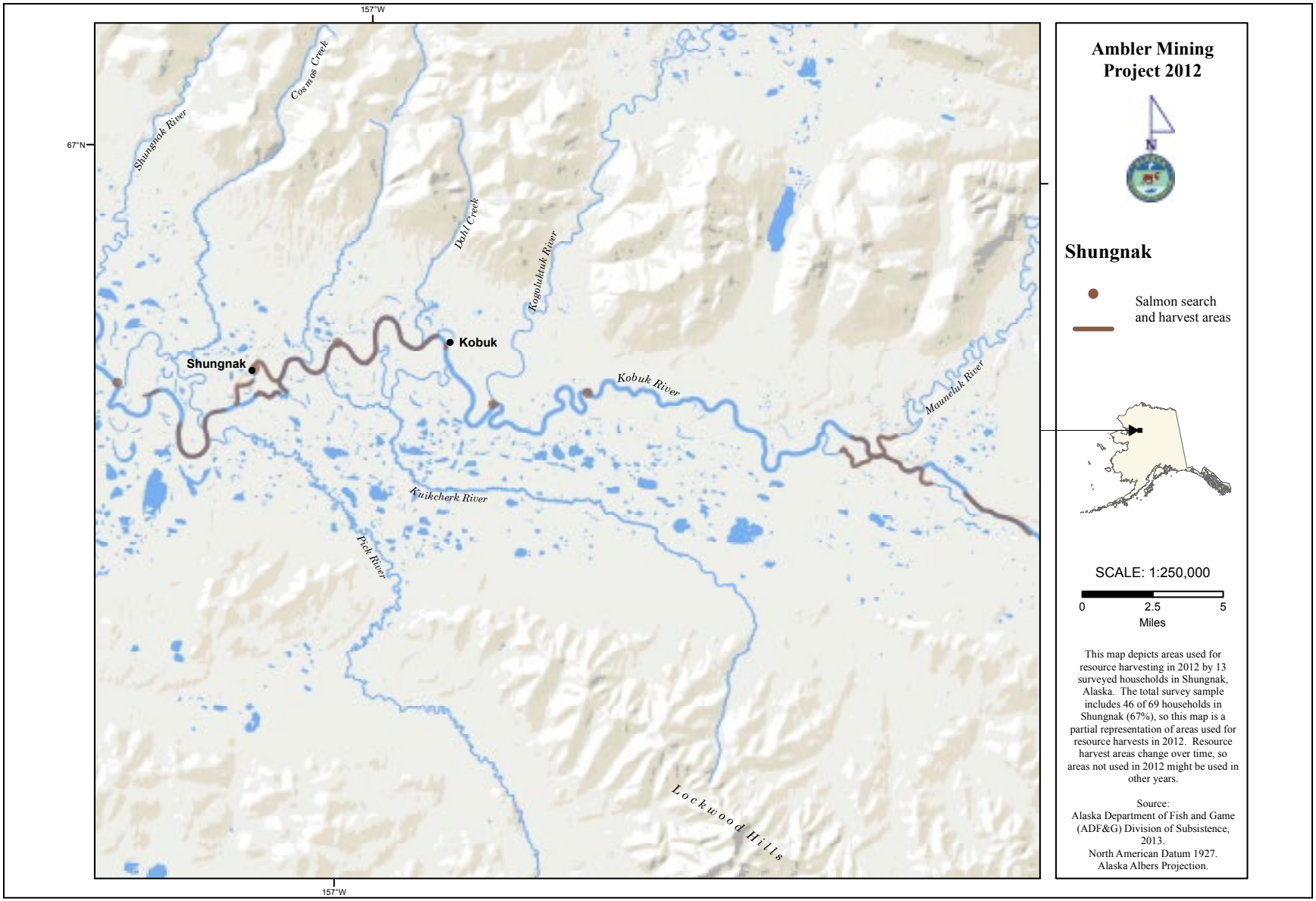

Figure 3-9.–Salmon search and harvest areas, Shungnak, 2012.

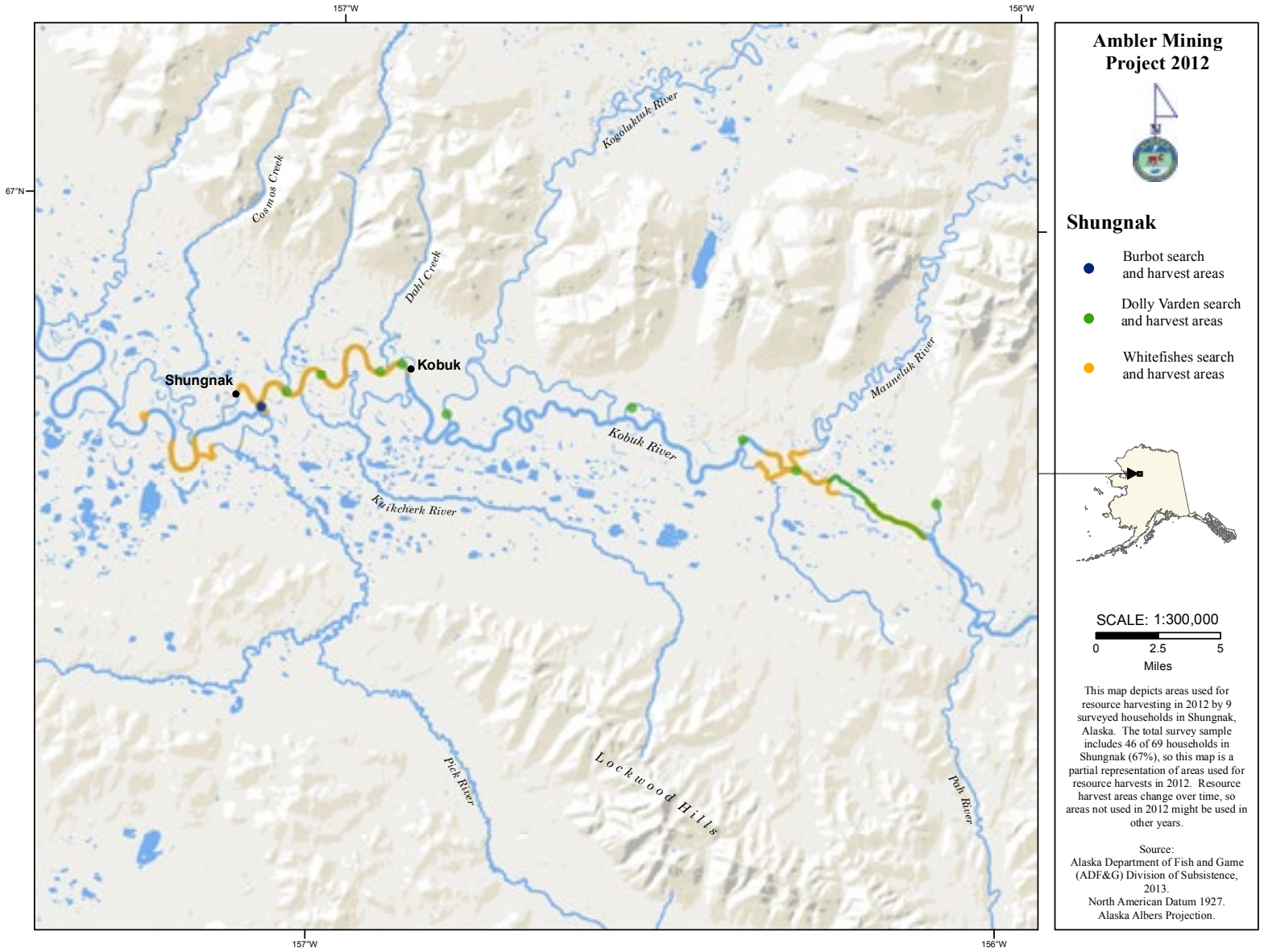

Figure 3-10.–Burbot, Dolly Varden, and whitefishes search and harvest areas, Shungnak, 2012.

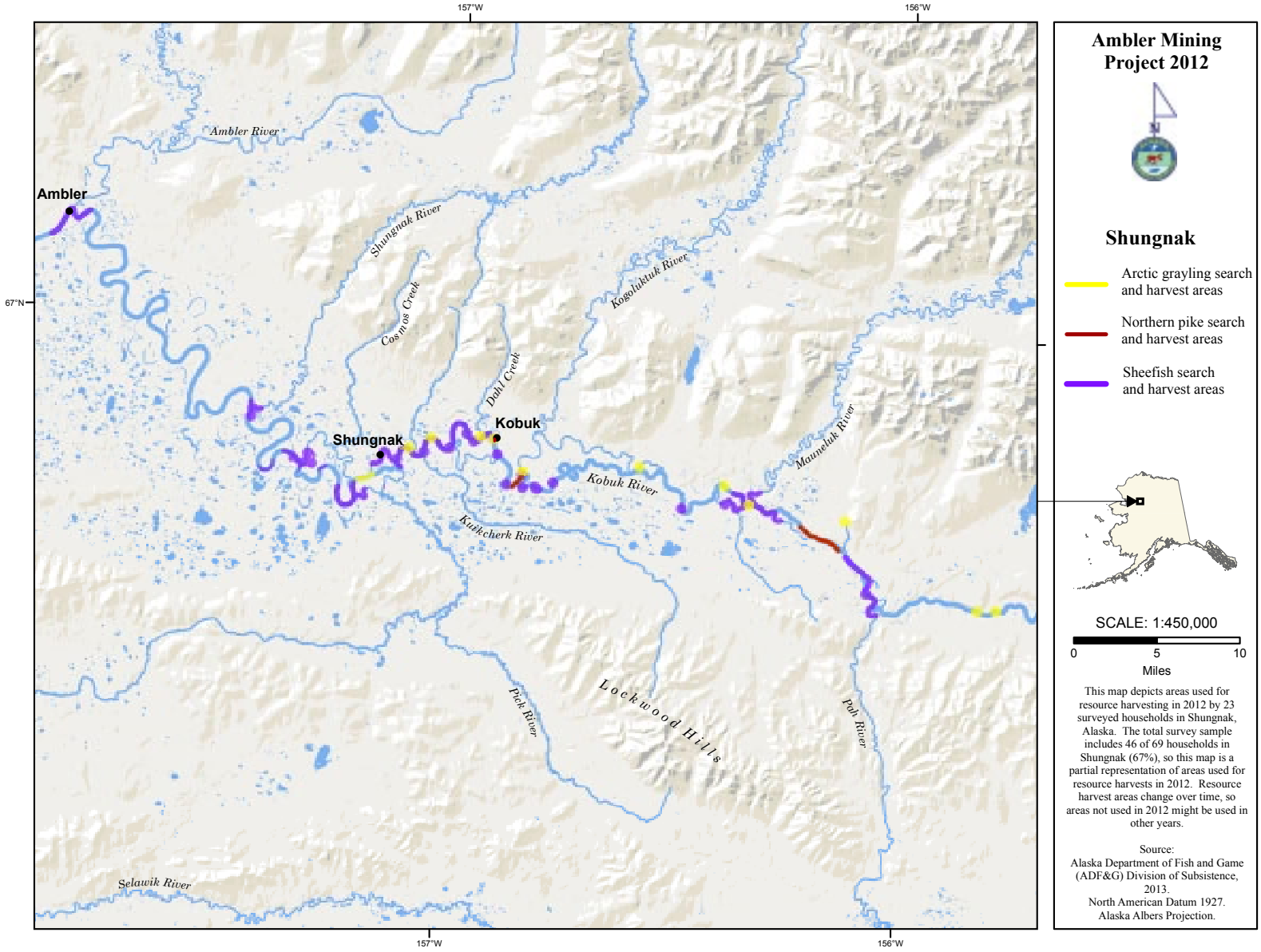

Figure 3-11.–Arctic grayling, northern pike, and sheefish search and harvest areas, Shungnak, 2012.

Various search and harvest areas for whitefish species in 2012 stretched from approximately 5 miles downstream of Shungnak to approximately 23 miles upriver from the community near the confluence of the Mauneluk River (Figure 3-10). The most extensive continuous search area for whitefishes was between Shungnak and Kobuk. Search and harvest areas for sheefish reached even farther than for the other whitefish species; fishing activity stretched intermittently from the vicinity of Ambler upriver to the confluence of the Pah River (Figure 3-11). As with other whitefishes, the largest continuous search and harvest area for sheefish occurred between the communities of Shungnak and Kobuk.

Shungnak residents used a variety of methods to harvest other kinds of fish (Figure 3-8). They harvested the majority of northern pike with setnets (96%) and the remainder with seines. Residents jigged to catch nearly all of the burbot (91%) and 41% of the Arctic grayling harvested by the community. Other methods for harvesting Arctic grayling included rod and reel (33% of harvest), setnet (16%), and seine (9%). Shungnak fishers harvested 74% of the Dolly Varden catch by rod and reel and smaller amounts by seine and setnet.

Search and harvest locations for other fish varied by species. Residents reported multiple sites for Dolly Varden ranging from between Shungnak and Kobuk to beyond the confluence of the Mauneluk River (Figure 3-10). Two distinct search and harvest areas were reported for northern pike: the first approximately 2 miles upriver from Kobuk and the other further upriver between the Mauneluk and Pah rivers (Figure 3-11). Shungnak residents searched for Arctic grayling from approximately 2 miles downstream of the community to upstream of the confluence of the Pah River. Residents reported 1 search and harvest area for burbot located approximately 1 mile upstream from Shungnak.

Large Land Mammals

Shungnak residents harvested and used much more caribou than any other large land mammal species during the study year (Table 3-4). As mentioned previously, this resource contributed 53% (53,802 lb) to the total estimated community harvest in 2012. Caribou accounted for 95% of the total large land mammal harvest and 93% of the total land mammal harvest. More households (94%) used caribou than any other land mammal resource, and they also shared it widely: 41% of households gave away caribou, and 74% of households received it. The community harvested an estimated total of 396 caribou, which provided 196 lb of meat per capita. Shungnak residents harvested a majority of the caribou in the fall months; 237 (60%) animals were harvested from August to October (Table D3-7). Caribou were also harvested in the spring between March and June (43 caribou, 11%). Respondents were unable to recall the exact month of harvest for 84 caribou (21%). Additional information on harvest timing can be found in Table D3-7.

Key respondents overwhelmingly highlighted the importance of caribou to their subsistence way of life (Plate 3-4). They also discussed how migration patterns vary from year to year, which affects the success of hunters. One respondent tied some of the change in migration patterns to the presence of predators, explaining that caribou will move to avoid bears and wolves. He also noted some general patterns in caribou migration that he has observed over the years:

> I think what it is, it's just the growth of the [vegetation on the] tundra. It's like they [caribou] rotate every time they migrate, they'll change the migrating route either through the coastal, through Kotzebue, Kiana, and Noorvik. Sometimes they'll go through there. Sometimes they'll travel through here. This year they did a lot of travel, to right below Shungnak. (SHG02030713)

A key respondent described some traditional rules governing the harvest of caribou. These include letting the first ones pass by, because the others will turn back if they sense that there is a problem (SHG02030713). Several key respondents also noted that the caribou have been arriving later than usual in the last few years, sometimes by as long as 3 weeks, and that they are occasionally crossing the Kobuk River further downriver than usual (SHG02030713; SHG06030513; SHG01071913).

Table 3-4.–Estimated harvest and use of land and marine mammals, Shungnak, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Land mammals										
Large land mammals										
Black bear	15.2%	6.5%	4.3%	13.0%	0.0%	264.0 lb	3.8 lb	1.0 lb	3.0 ind	± 81%
Brown bear	6.5%	2.2%	0.0%	6.5%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Caribou	93.5%	52.2%	47.8%	73.9%	41.3%	53,801.6 lb	779.7 lb	196.0 lb	395.6 ind	± 29%
Moose	52.2%	10.9%	6.5%	47.8%	8.7%	2,421.0 lb	35.1 lb	8.8 lb	4.5 ind	± 66%
Common muskox	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Dall sheep	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**95.7%**	**52.2%**	**47.8%**	**87.0%**	**43.5%**	**56,486.6 lb**	**818.6 lb**	**205.8 lb**	**403.1 ind**	**± 28%**
Small land mammals										
Beaver	50.0%	34.8%	34.8%	21.7%	23.9%	1,110.0 lb	16.1 lb	4.0 lb	67.5 ind	± 28%
Arctic fox	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Red fox	2.2%	0.0%	0.0%	2.2%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Alaska hare	2.2%	0.0%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Snowshoe hare	8.7%	4.3%	4.3%	4.3%	4.3%	37.5 lb	0.5 lb	0.1 lb	15.0 ind	± 83%
North American river (land) otter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Lynx	2.2%	2.2%	2.2%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	1.5 ind	± 116%
Marmot	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Marten	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Mink	2.2%	0.0%	0.0%	2.2%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Muskrat	15.2%	6.5%	6.5%	10.9%	4.3%	45.9 lb	0.7 lb	0.2 lb	26.1 ind	± 82%
Porcupine	2.2%	2.2%	0.0%	2.2%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Arctic ground (parka) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Gray wolf	8.7%	6.5%	6.5%	2.2%	0.0%	*Not usually eaten.*			12.0 ind	± 70%
Wolverine	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Subtotal	**50.0%**	**34.8%**	**34.8%**	**26.1%**	**23.9%**	**1,193.4 lb**	**17.3 lb**	**4.3 lb**	**122.1 ind**	**± 34%**
Marine mammals										
Bearded seal	19.6%	0.0%	0.0%	19.6%	4.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Ringed seal	2.2%	0.0%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Spotted seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown seal	67.4%	0.0%	0.0%	67.4%	4.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Beluga whale	6.5%	0.0%	0.0%	6.5%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Bowhead whale	43.5%	0.0%	0.0%	43.5%	2.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**71.7%**	**0.0%**	**0.0%**	**71.7%**	**6.5%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0%**
All land mammals	**95.7%**	**58.7%**	**54.3%**	**87.0%**	**47.8%**	**57,680.0 lb**	**835.9 lb**	**210.1 lb**	**525.2 ind**	**± 27%**
All marine mammals	**71.7%**	**0.0%**	**0.0%**	**71.7%**	**6.5%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0%**
All resources	**100.0%**	**100.0%**	**100.0%**	**97.8%**	**87.0%**	**100,872.3 lb**	**1,461.9 lb**	**367.5 lb**		**± 30%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

Moose accounted for 4% of the large land mammal harvest for Shungnak in 2012 and contributed 2,421 lb (9 lb per capita) to the total estimated community harvest (Table 3-4). Although residents only harvested an estimated 5 moose (7% of households), 52% of households in the community used moose; indeed, sharing of this resource is evident because 48% of households received moose. Despite the low harvest numbers, key respondents generally felt the moose population in the area is doing well (SHG06030513; SHG01071913; SHG03071813; SHG05071713). One respondent explained that 2012 was a difficult year for harvesting moose because the high water on the river caused the animals to spend more time near area lakes rather than along the easily-accessible river corridor (SHG01071913).

Residents also used (15% of households) and harvested (4%) small numbers of black bears during the study year; this species provided 264 lb of edible weight to the harvest (1 lb per capita). One respondent stated that most residents prefer the taste of black bear to brown bear, because brown bear meat is "tougher" (SHG05071713).

Small Land Mammals/Furbearers


Lisa Slayton

Plate 3-4.–Caribou are used by Shugnak residents for more than just edible meat. Hides are used to make traditional clothing and handicrafts, and sinew is used for sewing. Pictured are caribou leg skins used to construct leggings for boots.

Shungnak residents harvested an estimated 12 gray wolves, which were the only harvested furbearers not used for food during the study year (Table 3-4). Respondents indicated that community members harvest gray wolves opportunistically when hunting for other game. Residents also described a substantial increase in the population of wolves near the community (SHG01071913; SHG02030713; SHG03071813). One respondent explained that wolves have become a nuisance, citing concerns over children walking to school on their own and some scavenging of sheefish stored outside in the winter (SHG02030713). As mentioned above, respondents observed that wolves have an effect on caribou migration patterns. One hunter explained that he thought the wolves know where to wait for caribou by observing the trails that the herd has etched over the years: "We would see a lot of wolves out in the back. They were preventing them from coming down from the mountains and go where they normally pass, following those trails they used for years" (SHG01071913). Shungnak hunters harvested the majority of wolves in January and February (75%); they harvested the remaining 25% in November (Table D3-8).

Beavers contributed more to the total community edible harvest during the study year than any other small mammal 1,100 lb, or 4 lb per capita) (Table 3-4). Shungnak residents harvested an estimated 68 beavers, the majority of which were harvested in the month of May (73%) (Table D3-8). Several key respondents said that the beaver population had increased around Shungnak over the years, and some felt that this was due to the decline of fur trapping in the region in the last 3 decades (SHG01071913; SHG02030713; SHG03071813). Some key respondents thought that the population of other furbearers, particularly fox and lynx, had increased around the community for the same reason (SHG02030713; SHG01071913). Households reported limited harvest and use of other small land mammals in 2012 including snowshoe hare, lynx, and muskrat. See Table D3-8 for more information regarding the timing of small land mammal harvests in Shungnak during the study year.

Land Mammal Hunting and Harvest Locations

Shungnak residents reported a wide search and harvest area for caribou in 2012, including an approximately 40-mile stretch of the Kobuk River from Ambler to past the community of Kobuk (Figure 3-12). This area extended down the Pick River to the Lockwood Hills and a section of the Pah River. Another search and harvest area was located northeast of the community in the foothills of the Baird Mountains. Hunters searched for both caribou and moose in an area downriver from Ambler. Residents also reported hunting for moose near Shungnak and upriver near the confluence of the Maunelak River. There were 2 reported hunting areas for black bears in 2012: 1 near the community of Ambler and 1 upriver from Kobuk.

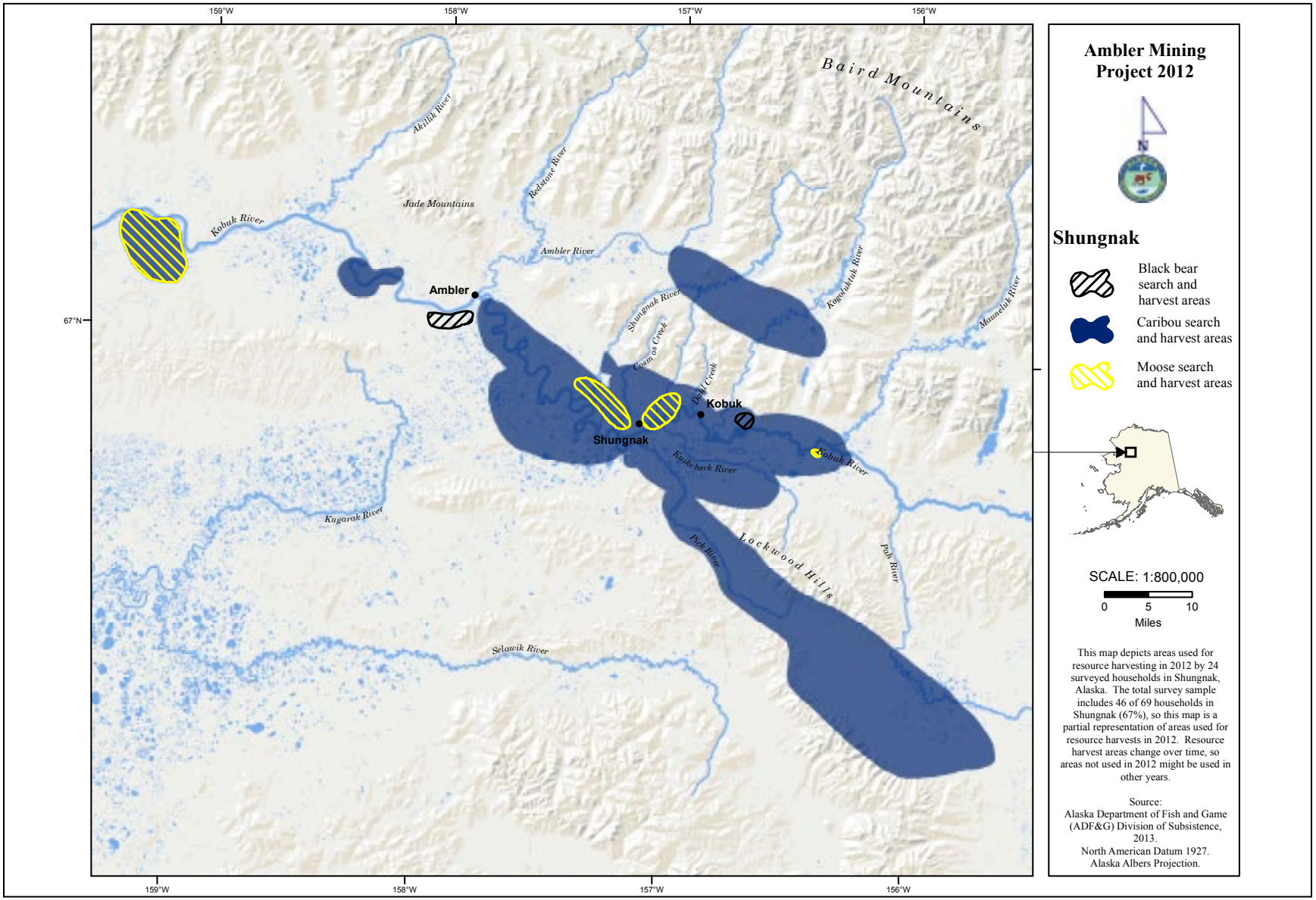

Figure 3-12.–Black bear, caribou, and moose search and harvest areas, Shungnak, 2012.

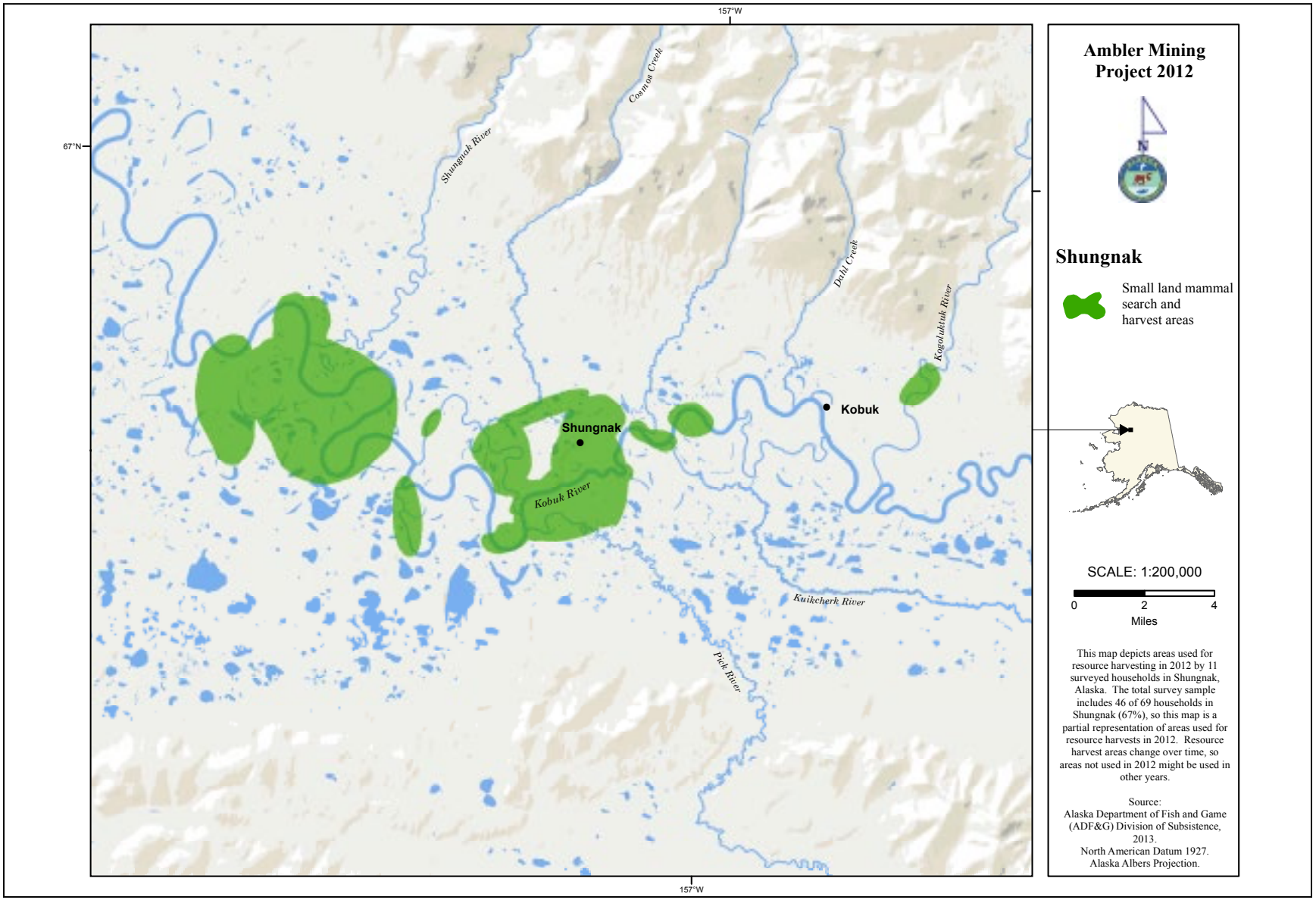

Figure 3-13.–Small land mammal search and harvest areas, Shungnak, 2012.

Table 3-5.–Estimated harvest and use of marine invertebrates, Shungnak, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Marine invertebrates										
Unknown clams	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
King crab	6.5%	2.2%	0.0%	4.3%	4.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Mussels	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Shrimp	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Unknown marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Subtotal	**6.5%**	**2.2%**	**0.0%**	**4.3%**	**4.3%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0**	**± 0%**
All marine invertebrates	**6.5%**	**2.2%**	**0.0%**	**4.3%**	**4.3%**	**0.0 lb**	**0.0 lb**	**0.0 lb**		**± 0%**
All resources	**100.0%**	**100.0%**	**100.0%**	**97.8%**	**87.0%**	**100,872.3 lb**	**1,461.9 lb**	**367.5 lb**		**± 30%**

Source ADF&G Division of Subsistence household surveys, 2013.
Note "All resources" include all species of fish, wildlife, and plants reported on the survey.
a. Amount of resource harvested is individual units, unless otherwise specified.

All search and harvest areas for small land mammals were within 25 miles of Shungnak; the largest hunting areas were reported near the vicinity of the village and downriver along the mainstem of the Kobuk River and surrounding lands (Figure 3-13). There was 1 small search and harvest area reported upriver from Kobuk along the Kogoluktuk River.

Marine Mammals

No households reported attempting to or harvesting marine mammals in 2012 (Table 3-4), probably because of the community's location on the upper Kobuk River. Despite Shungnak's distance from the coast, 67% of households received and used unknown seal, likely in the form of seal oil. The second most widely used marine mammal resource (by 43% of households) was bowhead whale consumed as muktuk. Key respondents explained that community members commonly traded local resources (such as caribou or fish) with coastal relatives and friends for marine resources (SHG02030713; SHG03071813; SHG06030513).

Marine Invertebrates

Shungnak residents reported very limited use of marine invertebrates during the study year; an estimated 7% of households used king crab (Table 3-5).

Birds and Eggs

Migratory waterfowl contributed the most edible weight of all bird categories to Shungnak's total estimated community harvest in 2012 (Table 3-6). Goose species contributed 1,477 lb (5 lb per capita), and duck species contributed 872 lb (3 lb per capita). White-fronted geese accounted for the largest portion (35%) of the bird harvest by weight, providing 878 lb of edible weight (3 lb per capita). Even though white-fronted geese were the most heavily harvested waterfowl during the study year, a greater percentage of households used Canada geese (54%) than white-fronted geese (33%). Canada geese were also the second most harvested bird species; they contributed 569 lb, or 2 lb per capita. Mallard ducks accounted for the third largest component of the bird harvest; residents harvested an estimated 202 lb (0.7 lb per capita). All migratory waterfowl were harvested in the spring (Table D3-9). Most respondents agreed that the population of migratory birds had generally remained stable over the years. However, a few respondents noted that snow geese seemed to be much more abundant in the region than they used to be and that black scoters seemed to have declined in number (SHG03071813; SHG01030613).

Shungnak residents harvested a small number of grouse and ptarmigan, which collectively contributed 153 lb to the total estimated harvest (0.6 lb per capita) (Table 3-6). A majority of upland game bird harvests occurred in the winter months (65%), and 30% occurred in the spring (Table D3-9).

Table 3-6.–Estimated harvest and use of birds, Shungnak, 2012.

	Percentage of households					Estimated pounds harvested				
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita	Total estimated amount[a] harvested by community	95% conf. limit
Migratory birds										
Ducks										
Bufflehead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Canvasback	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Common eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Goldeneye	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Harlequin duck	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Mallard	37.0%	19.6%	19.6%	26.1%	17.4%	201.8 lb	2.9 lb	0.7 lb	103.5 ind	± 40%
Long-tailed duck	17.4%	10.9%	10.9%	10.9%	10.9%	156.8 lb	2.3 lb	0.6 lb	117.0 ind	± 57%
Northern pintail	28.3%	15.2%	15.2%	15.2%	13.0%	159.1 lb	2.3 lb	0.6 lb	102.0 ind	± 44%
Scaup	8.7%	8.7%	8.7%	0.0%	8.7%	189.0 lb	2.7 lb	0.7 lb	112.5 ind	± 61%
Black scoter	10.9%	8.7%	8.7%	4.3%	6.5%	103.0 lb	1.5 lb	0.4 lb	58.5 ind	± 60%
Surf scoter	2.2%	0.0%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
White-winged scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Northern shoveler	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Green-winged teal	6.5%	2.2%	2.2%	4.3%	2.2%	7.8 lb	0.1 lb	0.0 lb	15.0 ind	± 116%
Wigeon	4.3%	2.2%	2.2%	2.2%	2.2%	19.7 lb	0.3 lb	0.1 lb	15.0 ind	± 116%
Unknown ducks	8.7%	4.3%	4.3%	4.3%	4.3%	34.5 lb	0.5 lb	0.1 lb	23.0 ind	± 115%
Subtotal	**58.7%**	**30.4%**	**30.4%**	**39.1%**	**26.1%**	**871.6 lb**	**12.6 lb**	**3.2 lb**	**546.5 ind**	**± 39%**
Geese										
Brant	2.2%	0.0%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Canada/cackling goose	54.3%	30.4%	28.3%	41.3%	23.9%	569.4 lb	8.3 lb	2.1 lb	166.5 ind	± 35%
Emperor goose	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Snow goose	2.2%	2.2%	2.2%	0.0%	2.2%	30.0 lb	0.4 lb	0.1 lb	7.5 ind	± 116%
White-fronted goose	32.6%	19.6%	19.6%	26.1%	17.4%	877.7 lb	12.7 lb	3.2 lb	207.0 ind	± 40%
Unknown geese	2.2%	2.2%	0.0%	0.0%	2.2%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1,477.1 lb**	**21.4 lb**	**5.4 lb**	**381.0 ind**	**± 34%**
Other migratory birds										
Tundra (whistling) swan	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Sandhill crane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown shorebirds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown loon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown seabirds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0%**
Other birds										
Grouse	8.7%	6.5%	6.5%	2.2%	2.2%	11.6 lb	0.2 lb	0.0 lb	16.5 ind	± 70%
Ptarmigan	34.8%	19.6%	17.4%	19.6%	17.4%	141.1 lb	2.0 lb	0.5 lb	141.1 ind	± 46%
Subtotal	**37.0%**	**19.6%**	**19.6%**	**19.6%**	**17.4%**	**152.6 lb**	**2.2 lb**	**0.6 lb**	**157.6 ind**	**± 45%**
All migratory birds	**65.2%**	**39.1%**	**37.0%**	**50.0%**	**28.3%**	**2,348.7 lb**	**34.0 lb**	**8.6 lb**	**927.5 ind**	**± 35%**
All other birds	**37.0%**	**19.6%**	**19.6%**	**19.6%**	**17.4%**	**152.6 lb**	**2.2 lb**	**0.6 lb**	**157.6 ind**	**± 45%**
All resources	**100.0%**	**100.0%**	**100.0%**	**97.8%**	**87.0%**	**100,872.3 lb**	**1,461.9 lb**	**367.5 lb**		**± 30%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

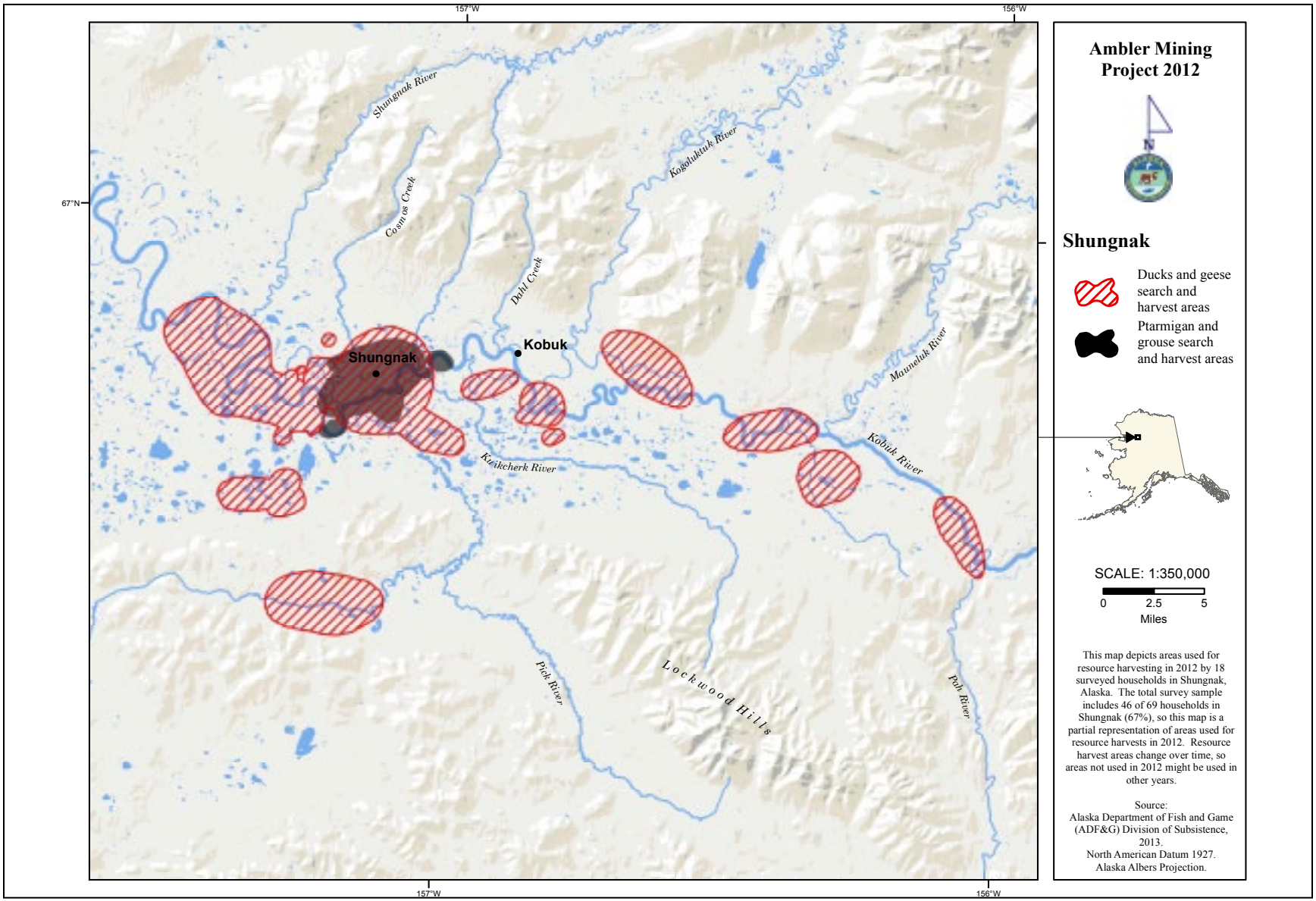

Figure 3-14.–Ducks, geese, ptarmigan, and grouse search and harvest areas, Shungnak, 2012.

Table 3-7.–Estimated harvest and use of bird eggs, Shungnak, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Bird eggs										
Duck eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Goose eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Swan eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Shorebird eggs	2.2%	0.0%	0.0%	2.2%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Gull eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**2.2%**	**0.0%**	**0.0%**	**2.2%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0%**
All birds and eggs	**71.7%**	**45.7%**	**43.5%**	**54.3%**	**37.0%**	**2,501.4 lb**	**36.3 lb**	**9.1 lb**	**1,085.1 ind**	**± 34%**
All resources	**100.0%**	**100.0%**	**100.0%**	**97.8%**	**87.0%**	**100,872.3 lb**	**1,461.9 lb**	**367.5 lb**		**± 30%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

No households reported harvesting bird eggs from any species during the study year. However, 2% of households received and used shorebird eggs (Table 3-7).

Shungnak residents reported a wide search and harvest area for ducks and geese during the study year (Figure 3-14). The largest search area surrounded the community in an approximately 2-mile radius and extended approximately 13 miles downstream along the mainstem of the Kobuk River. Other scattered search areas occurred upstream along the river: in the vicinity of Kobuk and near the confluences of the Maunelak and Pah rivers. In contrast, search areas for ptarmigan and grouse were within 5 miles of the village.

Vegetation

Berries composed the largest portion (90%) of the community's vegetation harvest by weight in 2012, and blueberries accounted for the largest component of the berry harvest (747 lb, 3 lb per capita) (Table 3-8). Blueberries were the most used resource in the vegetation category; 87% of households used them in 2012. As mentioned above, blueberries were the only vegetation resource that was represented in the top 10 most used resources, though they accounted for only 1% of the total estimated harvest in Shungnak. Residents also harvested significant amounts of lowbush cranberries (388 lb, 1 lb per capita) and salmonberries (123 lb, 0.4 lb per capita). Other edible plants, greens, and mushrooms collectively accounted for 10% of the vegetation harvest during the study year; wild rhubarb contributed the most edible weight in this category (114 lb, 0.4 lb per capita). Wood was an important source for heating homes during the winter months and for smoking fish in the summer; 38% of households used this resource in 2012.

The heavy rains that plagued the upper Kobuk area during the summer and fall of 2012 also impacted berry picking in the region. Some residents spent less time picking berries to avoid the rain, and 1 key respondent explained that the elders told people in the community that the berries would be small because they did not get enough sun (SHG02030713). Another key respondent noted the connection between the lack of snow and the quality of the berries:

> I love to pick berries. And um, I try to get about 6 or 10 gallons of cranberries and blueberries and I still do that. It's just that 2, 3, 4 years hardly any. I don't know why. The old people always say we need more snow during the winter for it, for them to grow summertime. (SHG02030713)

Table 3-8.–Estimated harvest and use of vegetation, Shungnak, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Berries										
Blueberry	87.0%	76.1%	76.1%	26.1%	37.0%	747.0 lb	10.8 lb	2.7 lb	186.8 gal	± 20%
Lowbush cranberry	52.2%	41.3%	41.3%	21.7%	26.1%	387.8 lb	5.6 lb	1.4 lb	96.9 gal	± 30%
Highbush cranberry	4.3%	2.2%	2.2%	4.3%	0.0%	6.0 lb	0.1 lb	0.0 lb	1.5 gal	± 116%
Crowberry	8.7%	4.3%	4.3%	4.3%	4.3%	27.0 lb	0.4 lb	0.1 lb	6.8 gal	± 82%
Salmonberry	30.4%	26.1%	26.1%	10.9%	15.2%	123.0 lb	1.8 lb	0.4 lb	30.8 gal	± 38%
Subtotal	**87.0%**	**76.1%**	**76.1%**	**32.6%**	**39.1%**	**1,290.8 lb**	**18.7 lb**	**4.7 lb**	**322.7 gal**	± 21%
Plants/greens/mushrooms										
Wild rhubarb	10.9%	8.7%	8.7%	4.3%	6.5%	114.0 lb	1.7 lb	0.4 lb	33.0 gal	± 63%
Eskimo potato	6.5%	6.5%	6.5%	2.2%	2.2%	6.9 lb	0.1 lb	0.0 lb	1.7 gal	± 101%
Hudson's Bay (Labrador) tea	4.3%	4.3%	4.3%	0.0%	0.0%	2.3 lb	0.0 lb	0.0 lb	2.3 gal	± 86%
Sourdock	2.2%	2.2%	2.2%	0.0%	0.0%	12.0 lb	0.2 lb	0.0 lb	12.0 gal	± 116%
Willow leaves	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Unknown mushrooms	2.2%	2.2%	2.2%	0.0%	0.0%	0.8 lb	0.0 lb	0.0 lb	0.8 gal	± 116%
Stinkweed	17.4%	13.0%	13.0%	6.5%	8.7%	10.9 lb	0.2 lb	0.0 lb	10.9 gal	± 68%
Unknown greens from land	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Subtotal	**34.8%**	**30.4%**	**30.4%**	**10.9%**	**15.2%**	**146.8 lb**	**2.1 lb**	**0.5 lb**	**60.6 gal**	± 42%
Wood										
Other wood	37.8%	37.0%	37.0%	4.4%	8.9%	*Primarily used as firewood.*				
Subtotal	**37.8%**	**37.0%**	**37.0%**	**4.4%**	**8.9%**	***Primarily used as firewood.***				
All vegetation	**95.7%**	**95.7%**	**95.7%**	**39.1%**	**52.2%**	**1,437.6 lb**	**20.8 lb**	**5.2 lb**	**383.3 gal**	**± 20%**
All resources	**100.0%**	**100.0%**	**100.0%**	**97.8%**	**87.0%**	**100,872.3 lb**	**1,461.9 lb**	**367.5 lb**		**± 30%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

Heat can also negatively affect berries because they "burn" in the sun (SHG01071913). Salmonberries, or *aqpiks*, are particularly prone to this: they need to be picked shortly after they "bud out" (SHG06030513).

Shungnak residents also harvested other plants. They collected sourdock (*quagaq*) in June when the leaves were small. Residents boiled the sourdock and kept it in the freezer, and they mixed it with seal oil or berries. Families picked Eskimo potato, or *masru*, in late September, "when they get sweet" (SHG06030513). Some residents collected masru from "mouse cellars," caches of roots put aside by mice:

> And when they dig it [mouse cellar] out, they'll be nice and clean. And then what they all do is get candy or a piece of fish or anything, put it in there, in their cellar, and just cover it back, because that's like trading, you're taking their food and giving them their food to the mouse. (SHG06030513)

In addition to gathering vegetation for food, residents harvested some vegetation for medicinal purposes. Dried stinkweed (*sargiq*) can be applied directly to a sore, infected cut, or toothache. It can also be boiled in water. One key respondent described collecting stinkweed in the wintertime when it can be seen above the snow, and when it is already dried and ready for use (SHG06030513).

Firewood remained an important resource for Shungnak residents, and respondents highlighted its vital role as a supplement to heating oil during the winter months. It was also an element of the local cash economy: some residents gathered wood to sell (SHG03071813; SHG01071913).

Search and harvest areas for berries and greens were generally close to Shungnak; the largest area covered a 2- to 3-mile radius around the community (Figure 3-18). Residents also reported searching for vegetation downriver from the community along the mainstem of the Kobuk River near its confluence with the Shungnak River. Other search and harvest areas were reported in the vicinity of Kobuk and upriver from Kobuk (approximately 5 mi).

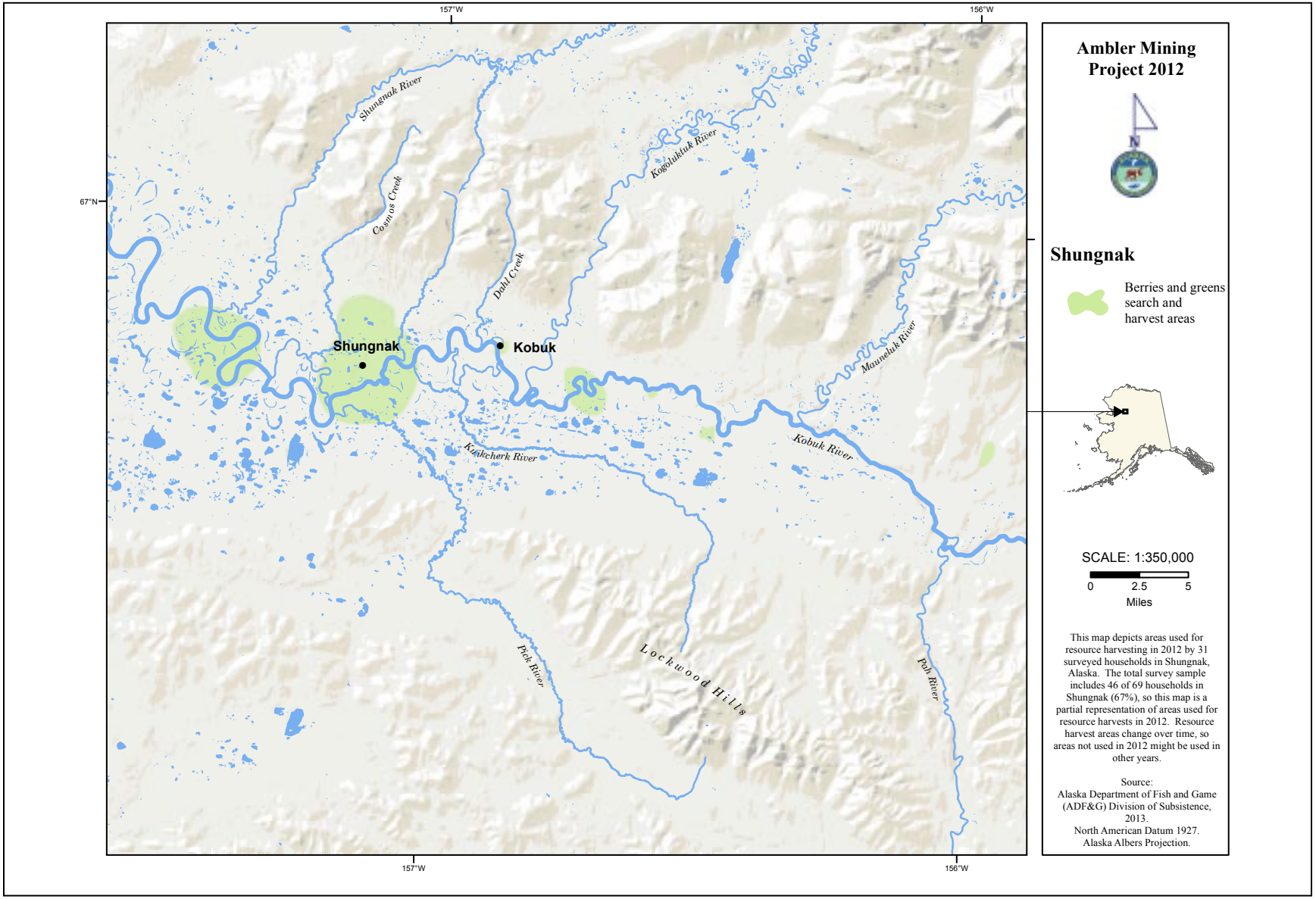

Figure 3-15.–Berries and greens search and harvest areas, Shungnak, 2012.

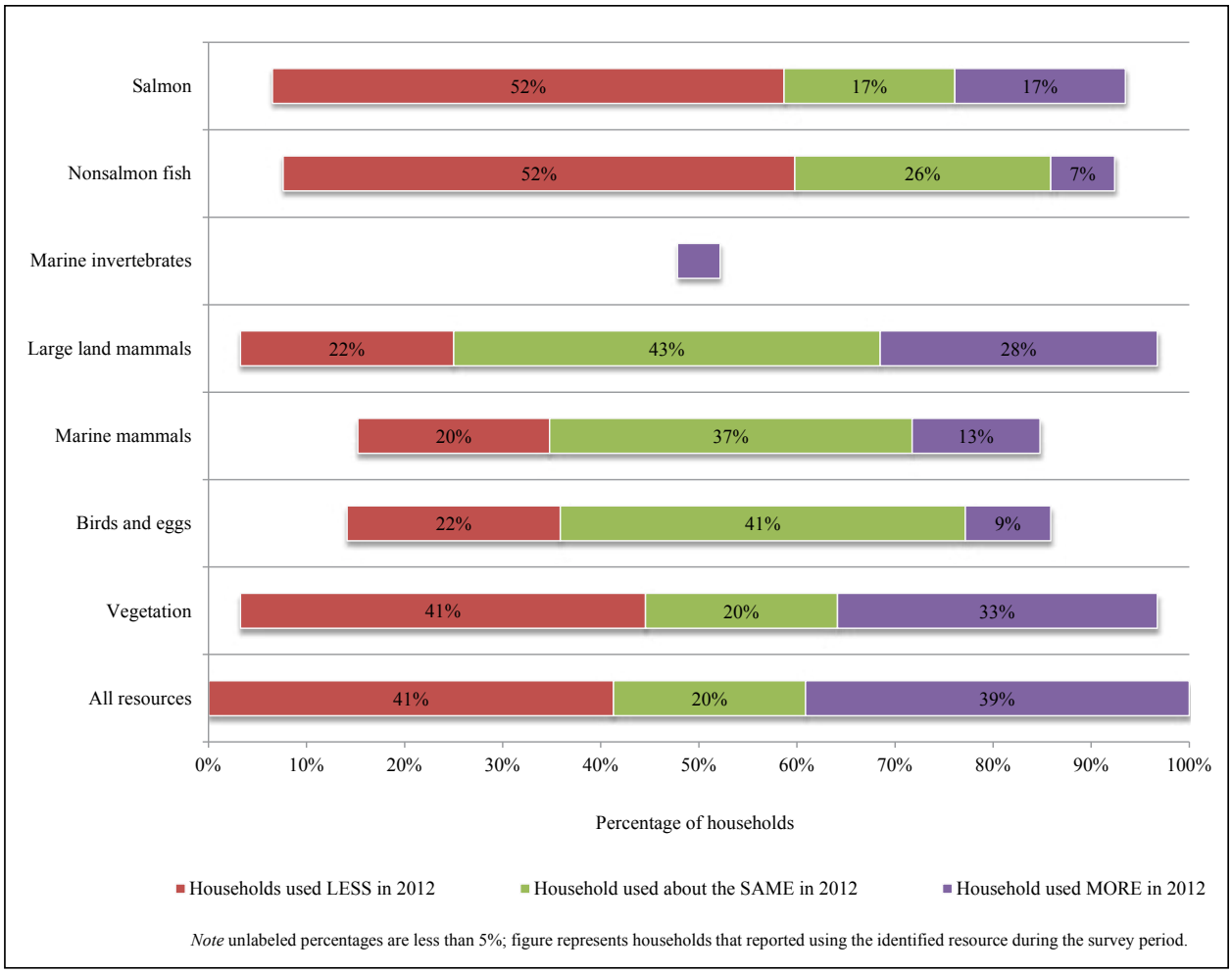

Figure 3-16.–Household uses of resources compared to recent years, Shungnak, 2012.

Harvest Assessments

The survey asked respondents to assess their household's harvests in 2 ways: whether they used less, the same, or more of 6 resource categories in the study year as in recent years, and whether they got "enough" of each of those categories. It also asked households to do the same assessment of subsistence resources overall. "Recent years" was defined as about the last 5 years. If a household reported a change in use (through a "less" or "more" response) the respondent was asked why. When households said they did not get enough of a resource category, they were asked a series of follow-up questions to determine what species was needed, why the household did not get enough, the severity of the impact to the household, and whether the household did anything differently as a result. Comments that people gave describing what they did differently were characterized and grouped for analysis.

Figure 3-16 depicts responses to the "less, same, more" assessment question and Figure 3-17 depicts responses to the "get enough" assessment questions. Percentages do not include households that did not answer the question or reported that they do not ordinarily use the resource.[7] The latter results in fewer responses for less commonly used categories such as marine invertebrates, and manifests in the chart as a very short bar compared to categories such as nonsalmon fish or large land mammals, which are ordinarily used by most households. Therefore, these figures only reflect the responses of households who ordinarily use a resource and who provided an answer. Further information on these details can be found in Appendix D, including reasons for changes in use patterns (Table D3-10; Table D3-11), resources of which households

7. For example, to ask a household that never uses marine invertebrates if it got enough of them is confusing.

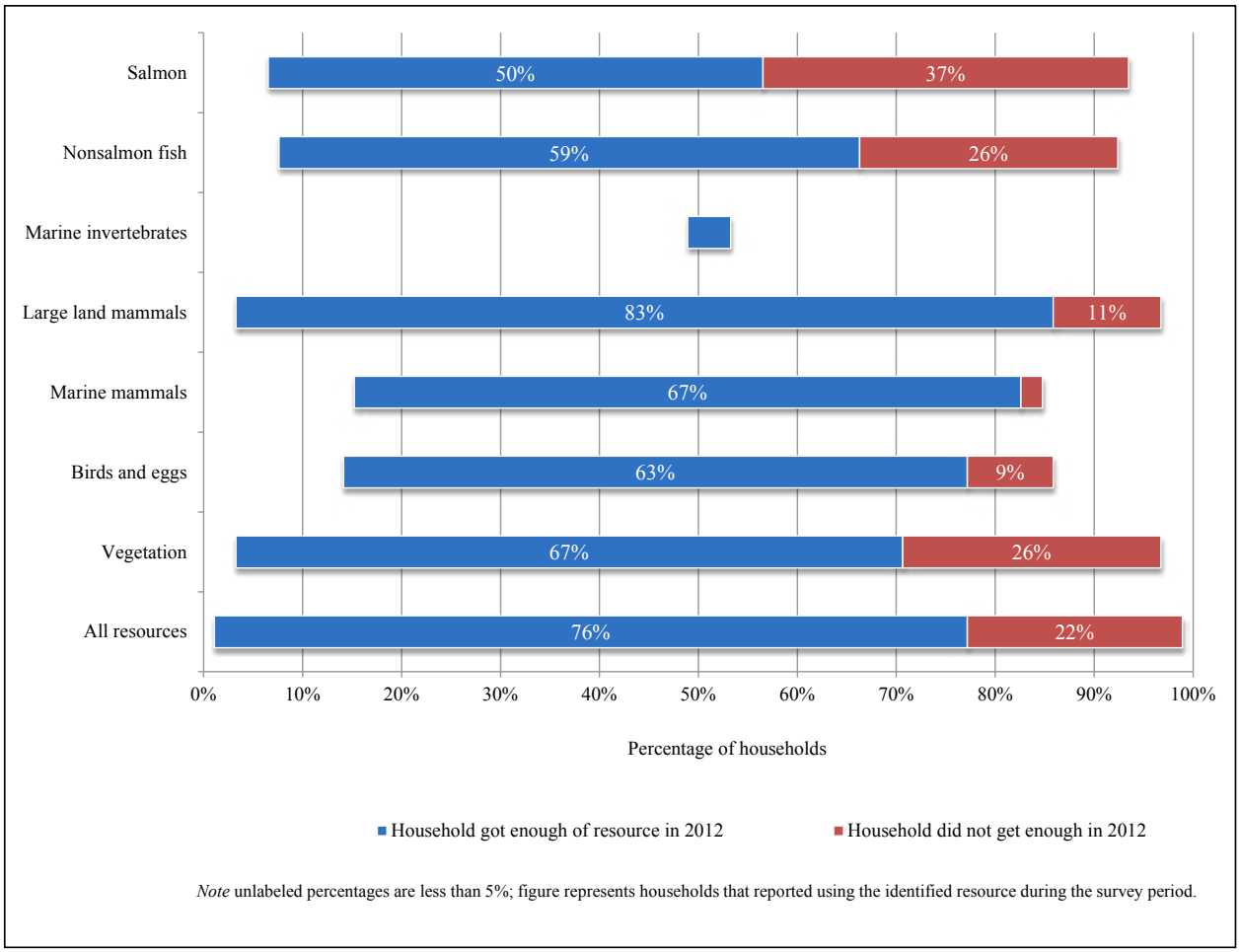

Figure 3-17.–Percentage of households reporting whether they got enough resources, Shungnak 2012.

reported needing more (Table D3-12), reported impact of not getting enough of a resource (Table D3-13), and adaptive changes for not getting enough of a resource (Table D3-14).

Subsistence harvest success can also be assessed by comparing current harvest estimates with past harvest estimates, which will be discussed in a later section.

For most resource categories, a majority of households reported using the same or more of a resource in 2012 compared to recent years (Figure 3-16). Additionally, a majority of respondents reported getting enough in all resource categories (Figure 3-17). The apparent disparity between the 2 figures for salmon and nonsalmon fish may indicate a 2012 harvest that was lower than recent years but still met the needs of households in the community.

Salmon and nonsalmon fish collectively accounted for 39% of Shungnak's total estimated community harvest. However, fewer households reported that they got enough of these resources than other resources (50% and 59%, respectively) (Table 3-3; Figure 3-17). Correspondingly, 52% of respondents reported using less of both salmon and nonsalmon fish than they have in recent years (Figure 3-16). As mentioned earlier, a number of key respondents explained that continuous rains and high water on the river hindered fishing from the summer through the fall months. The negative effect of the weather was also apparent when respondents were asked why they used less of these resources in 2012 in comparison with recent years; 62% of households said they used less salmon because of weather or the environment, and 68% cited the same reason for less use of nonsalmon fish (Table D3-10). For salmon, 47% of households described the impact of not getting enough as minor, 26% said the impact was major, and 5% said that not getting enough salmon

had a severe impact on their households (Table D3-13). For nonsalmon fish, 39% of households described the impact of not getting enough as minor, 54% described the impact as major, and 8% said it was severe. One-half of respondents (50%) said they needed more chum salmon, and 21% said they needed more whitefishes (Table D3-12). A majority of respondents who responded to the question reported that they used more commercial foods or substituted the resource with other subsistence foods as a result of not getting enough salmon or nonsalmon fish (Table D3-14).

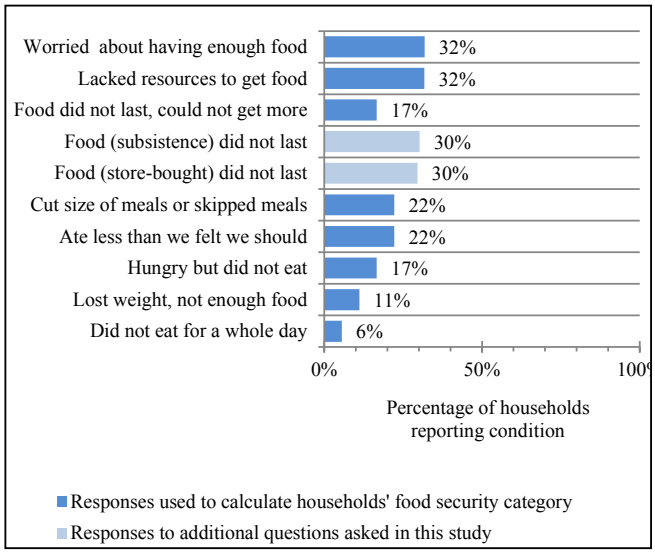

Figure 3-18.–Responses to questions about food insecure conditions, Shungnak, 2012.

An estimated 41% of responding households reported using less vegetation, including berries, greens, and wood; however, a majority of respondents (67%) said that they got enough of this resource (Figure 3-16; Figure 3-17). This apparent discrepancy may be due to households still feeling like their needs were met despite using less vegetation in 2012. Because this resource collectively accounted for only 2% of the total estimated harvest, households may not have needed vegetation as critically as resources such as land mammals and fish (Table 3-8). Most respondents said that they used fewer berries and greens during the study year because of weather or the environment and not having enough time to harvest them due to employment (Table D3-10). The impacts of not getting enough vegetation varied for responding households: 17% said the impact was not noticeable, equal percentages of households (33%) described it as minor and major, and 8% said that the impact to their family was severe (Table D3-13). The largest percentage of respondents (29%) said they needed more blueberries, and 75% of responding households said they used more store-bought foods as a result of not getting enough vegetation (Table D3-12; Table D3-14).

Overall, 59% of Shungnak households reported using the same amount or more of all wild foods than in recent years, although 76% reported getting enough of all subsistence resources in 2012 (Figure 3-16; Figure 3-17). As in the case of vegetation, households may have felt that their needs were still met despite having a lower harvest than in recent years. Most responding households described some impact of not getting enough subsistence resources: 40% said the impact to their families was minor, and 50% said it was major (Table D3-13). When asked if they did anything differently as a result of not getting enough subsistence resources, 78% of households that responded stated they bought more store-bought foods (Table D3-14). Some respondents (39%) did report using more subsistence resources during the study year (Figure 3-16). The reasons for using more wild foods varied. A majority of respondents (50%) stated that they received more subsistence resources in 2012 than they usually do; 25% of respondents cited increased availability (Table D3-11).

Food Security

Survey respondents were asked a set of questions intended to assess their household's food security, defined as, "access by all people at all times to enough food for an active, healthy life" (Coleman-Jensen et al. 2012:2). The food security questions were modeled after those developed by the U.S. Department of Agriculture (USDA) but modified by ADF&G to account for differences in access to subsistence and store-bought foods. Based on their responses to these questions, households were broadly categorized as being food secure or food insecure following a USDA protocol (Bickel et al. 2000). Food secure households were broken down further into 2 subcategories: high or marginal food security. Food insecure households were divided into 2 subcategories: low food security or very low food security.

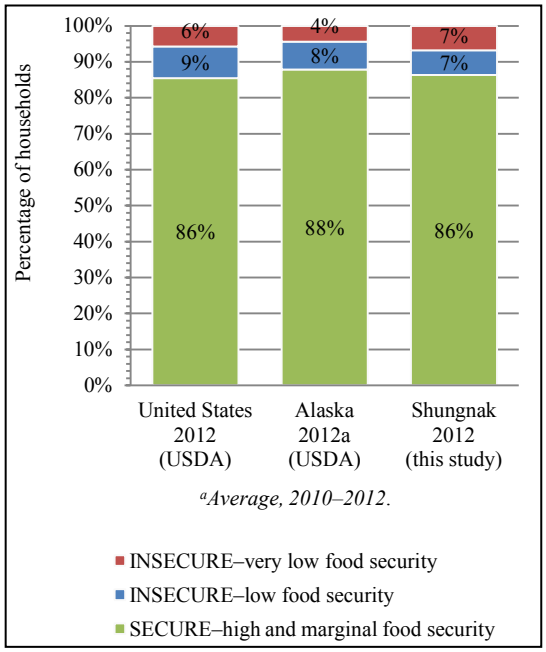

Figure 3-19.–Food security categories, Shungnak, 2012.

Households with high food security did not report any food access problems or limitations. Households with marginal food security reported 1 or 2 instances of food access problems or limitations—typically anxiety over food sufficiency or a shortage of particular foods in the house—but gave little or no indication of changes in diets or food intake. Households with low food security reported reduced quality, variety, or desirability of their diet, but they, too, gave little indication of reduced food intake. Households classified as having very low food security were those that reported multiple instances of disrupted eating patterns and reduced food intake (Coleman-Jensen et al. 2012:4).

Core questions and responses from Shungnak residents are summarized in Figure 3-18. Sources of food insecure conditions appeared to revolve around worries over having enough food to meet household needs as well as a lack of resources to get foods; 32% of households reported these conditions during the study year. Equal percentages of households (30%) reported that both store-bought and subsistence foods did not last in their households and that they could not get more. The consequences of food insecure conditions had a dramatic impact on some residents; 22% of respondents reported that adults in the household cut the size of meals or skipped meals altogether, or that they ate less than they felt they should.

Food security survey results from Shungnak, the state of Alaska, and the United States are compared in Figure 3-19. During the 2012 study year, 86% of Shungnak households were identified as being food secure. Of the remaining households, 7% exhibited low food security, and 7% had very low food security. Shungnak residents were more food secure than the national average and had the same food security levels as the state of Alaska overall. Despite this, rates for very low food security were higher in Shungnak (7%) than either the national (6%) or state averages (4%).

Food insecure conditions in Shungnak appear to have been influenced by seasonal timing (Figure 3-20). For those households with very low food security, April, September, and October were the months with the fewest reported food insecure conditions. Caribou harvests, which occur most frequently in the spring and fall months, likely contributed to higher food security during these 3 months. The spike in food insecure conditions during the late spring and through the summer months may be a result of poor fishing conditions during the study year. For households with low food security, food insecure conditions were highest in the fall and winter months; these conditions increased in the month of September and remained generally high through the month of February. Although less stark than the very low food security group, low food secure households also reported a modest increase in food insecure conditions in the summer months; like very low food secure households, this increase may be due to a difficult fishing season. For both low and very low food secure households, the added burden of heating costs during the winter months may be an additional challenge to purchasing store-bought foods or gasoline for subsistence pursuits.

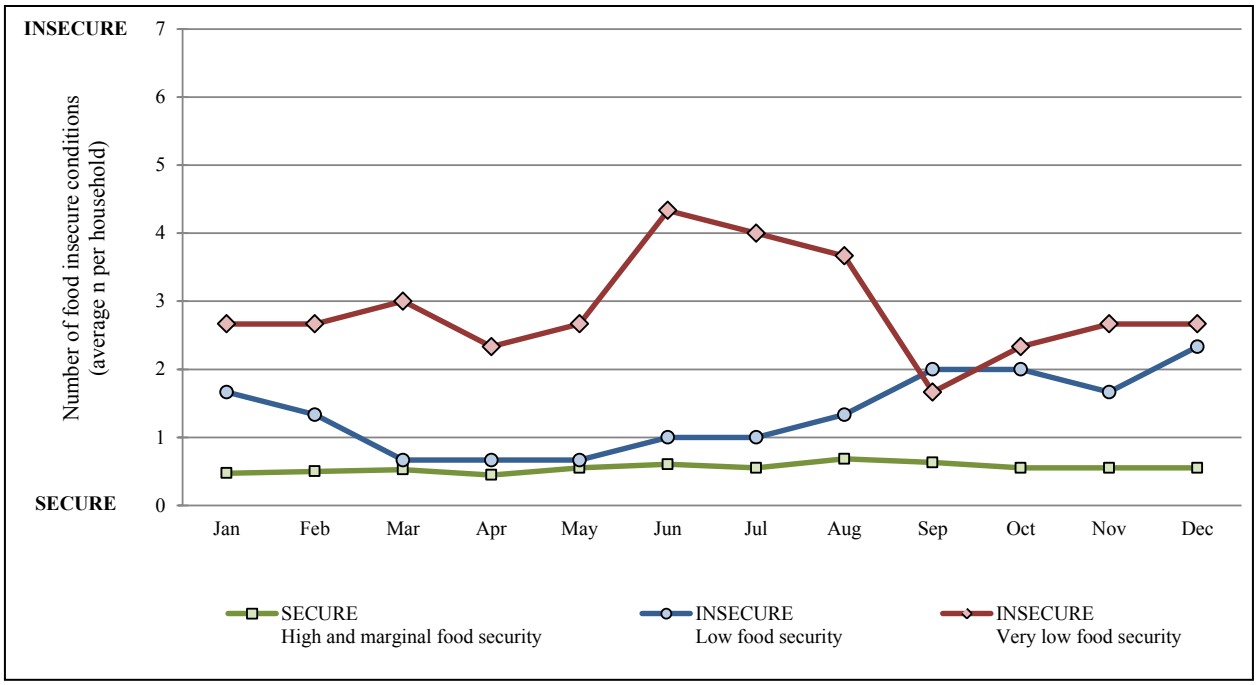

Figure 3-20.–Mean number of food insecure conditions by month and by household security category, Shungnak, 2012.

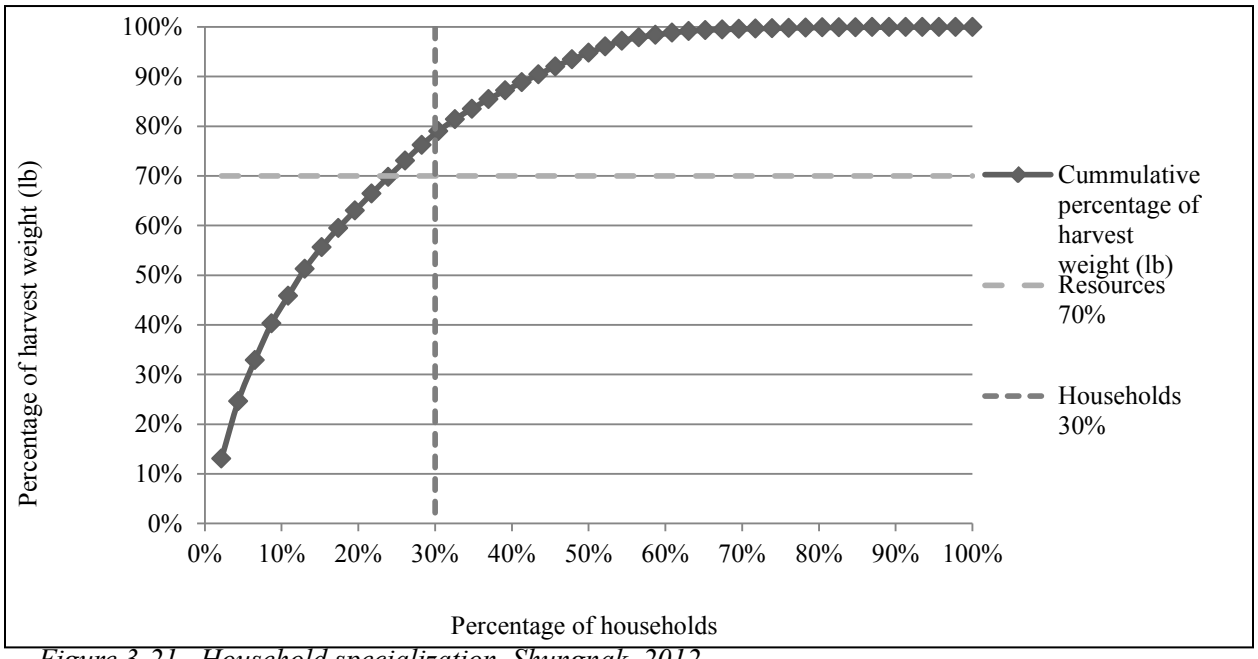

Figure 3-21.–Household specialization, Shungnak, 2012.

Household Specialization in Resource Harvesting

Previous studies by the Division of Subsistence (Wolfe and Walker 1987; Wolfe et al. 2010) have shown that in most rural Alaska communities, a relatively small portion of households produces most of the community's fish and wildlife harvests, which they share with other households. A recent study of 3,265 households in 66 rural Alaska communities found that about 33% of the households accounted for 76% of subsistence harvests (Wolfe et al. 2010). Although overall the set of very productive households was diverse, factors that were associated with higher levels of subsistence harvests included larger households with a pool of adult male labor, higher wage income, involvement in commercial fishing, and community location.

As shown in Figure 3-21, in the 2012 study year in Shungnak, about 79% of the harvest of wild resources as estimated in usable pounds was harvested by 30% of the community's households. The characteristics of highly productive households will be discussed in the Wild Food Networks section of the chapter.

Wild Food Networks

While subsistence harvest surveys collect information based on individual households, in reality, much of the production (harvest and processing) of subsistence foods is achieved by households within a community that work cooperatively. This cooperation is often organized along kinship lines or based on other imporant social ties found in communities with Alaska Native histories. The organization of contemporary mixed market–subsistence economies that are predominant in rural Alaska communities has been documented ethnographically by numerous researchers. Of particular interest for northwest Alaska are reports from Anderson et al. (1977), Burch Jr. (1988), Ellanna (1983), Langdon and Worl (1981), Alaska Department of Fish and Game (1990), Magdanz et al. (2002), Wolfe and Walker (1987), Wolfe and Ellanna (1983), and Fall (1990).

Cooperation in the production of foods is only part of the picture. Subsistence foods are widely distributed among households within a community through sharing, barter, and trade (Charnley 1984; Kari 1983; Lonner 1980; Magdanz and Wolfe 1988; Magdanz 1988; Magdanz et al. 2007; Moncrieff 2007; Pete 1991; Schroeder et al. 1987; Stickney 1984; Wolfe et al. 1993)

In this study, survey questions asked households who harvested and processed the subsistence foods they used during the year. If a resource was received by a household, the respondent was also asked which household in the community shared or traded that resource with them. Confidentiality was preserved by identifying households only by a random identification number. If a household lived in another community, the name of the community was recorded.

Figure 3-22 depicts a network of wild food exchanges[8] between households in Shungnak and with households in other Alaska communities. The figure is a partial representation of sharing, trade, and barter during the study period because it only documents the food flows into the 46 surveyed households. Symbol shapes depict the type of household; their colors show the age of heads of household, and their sizes are scaled to indicate the amount of a household's subsistence harvest by edible weight. Arrowed lines show the direction of the exchange and are weighted to show multiple exchanges. Households or communities near the center of the figure were the most active in the network, either by receiving food from others, or being identified as a source by others.

Previous studies have found a positive association between the ages of household heads and the amount of subsistence foods harvested. Household characteristics associated with higher food production include those households with multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing households included female household heads, age of elders, non-Native household heads, and single-person households (Wolfe et al. 2010). Household "developmental cycles" (i.e., the relative age or "maturity" of household heads and number of productive household members) have also been associated with harvests.

8. These exchanges may be goods (subsistence foods) or services (labor, i.e., harvesting or processing of subsistence foods).

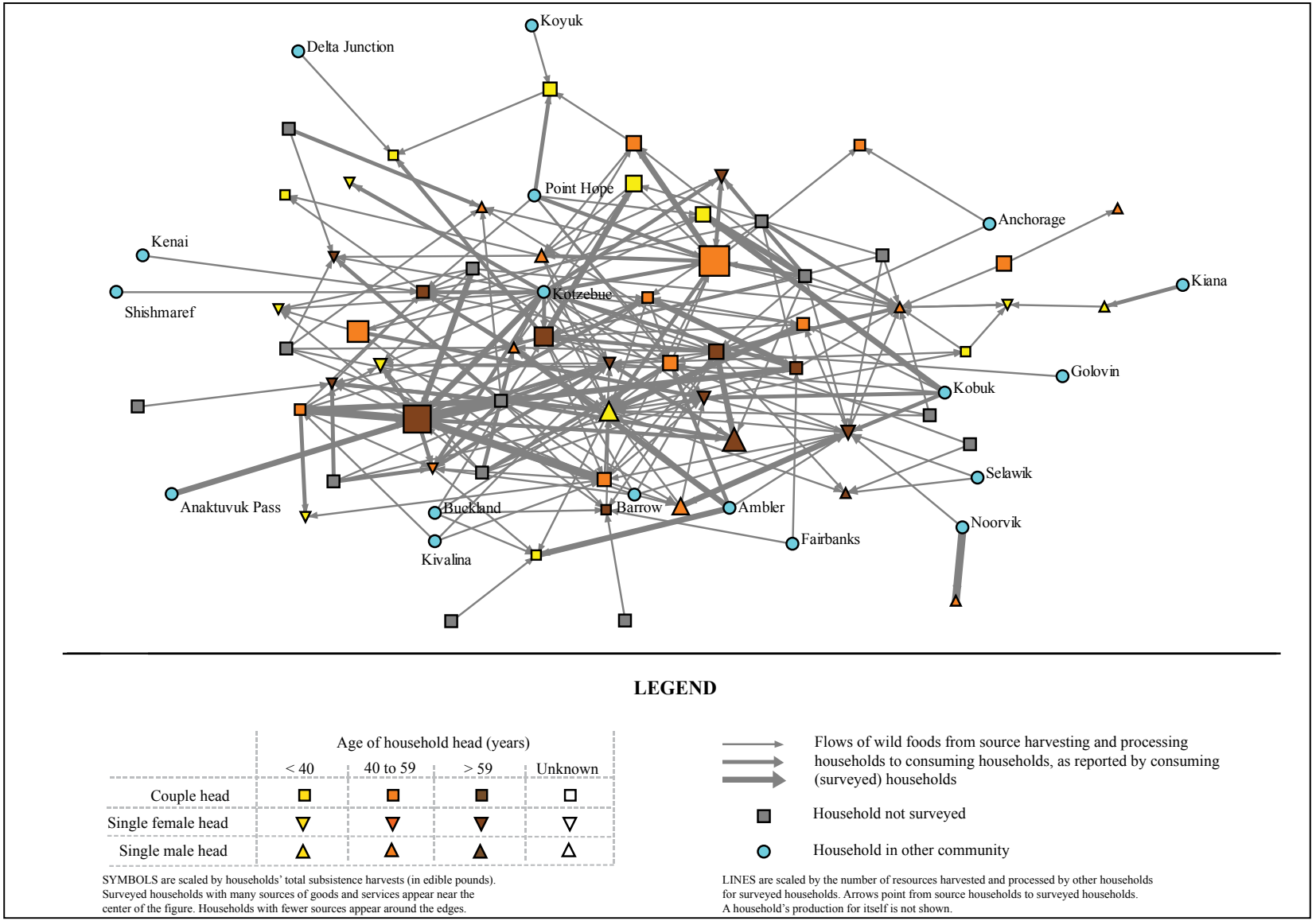

Figure 3-22.–Wild food harvesting and processing network, Shungnak, 2012.

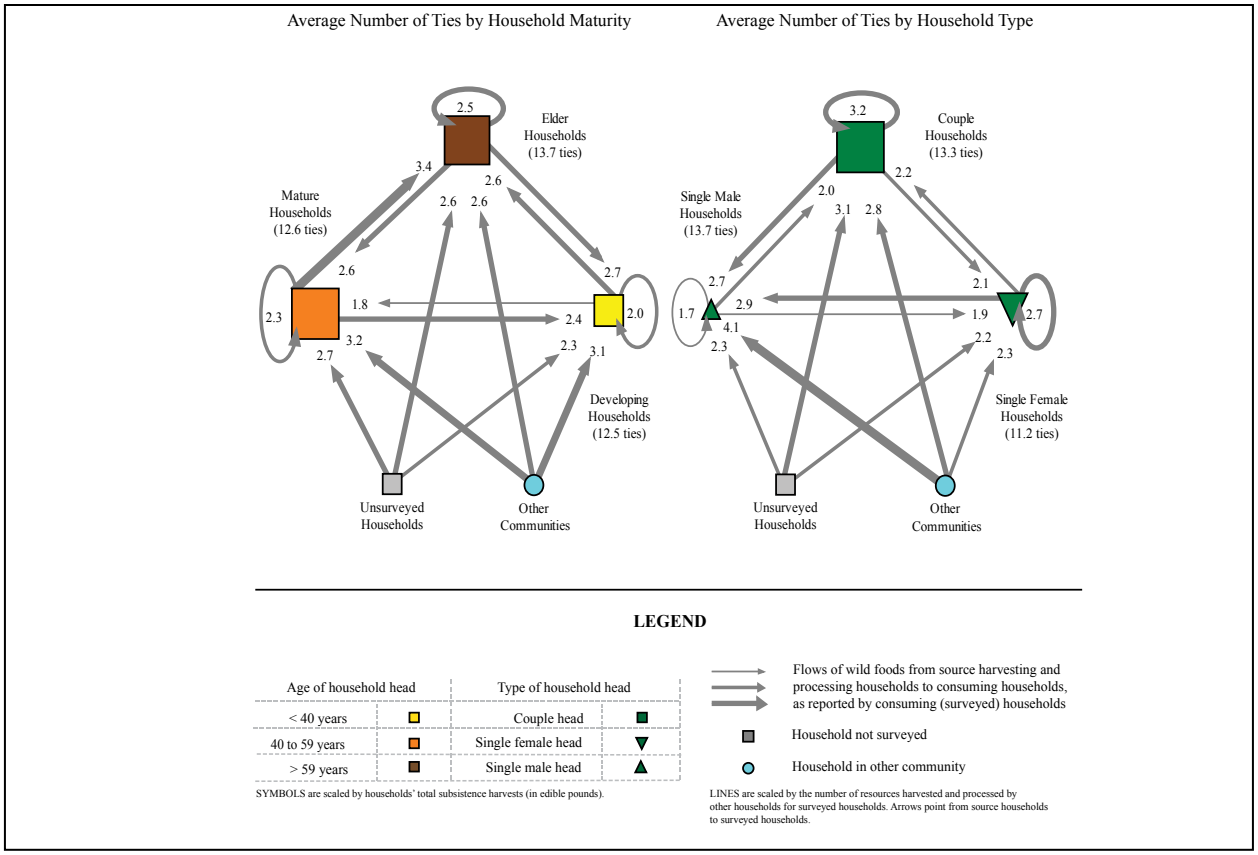

Figure 3-23.–Wild food harvesting and processing network by household maturity and type, Shungnak, 2012.

There were several high harvesting households in Shungnak during the study year, as indicated by the size of the nodes representing them. The highest harvesting households were generally headed by a couple, either between the ages of 40 and 59 or older than 60 years of age; 1 high harvesting household was headed by a single active male elder. Magdanz et al. (2004) argued that higher harvest levels are connected to the maturity level of the household; the highest producers tend to be mature couples, active elder households, and single active males. This pattern appears to hold true in the network data collected in Shungnak in 2012.

All key respondents noted the importance of sharing in the community to take care of those in need, particularly elders. Certain types of households, such as those headed by inactive elders or a single parent, were more likely to receive help from others and were therefore more centrally located in the diagram due to multiple sharing connections with other households in the community. When examining the diagram, it is important to note the weight of the lines connecting households; the thicker lines indicate more resources flowing between particular households. The Maniilaq Association runs a program that provides funds to tribal governments to allow local volunteers to purchase ammunition and gasoline to hunt for village elders who are no longer able to harvest subsistence resources.[9] One key respondent who participated in the program highlighted its importance to the community and described it as a chance for hunters to engage in the subsistence activities they enjoy and to take care of others (SHG03071813).

There were no isolated households in Shungnak in 2012, which indicates that all households were integrated into the food distribution network. A relative newcomer to the village described an outsider's perspective on the sharing network in the community:

9. Maniilaq Association. n.d. Cultural Services. Accessed September 28, 2013. http://www.maniilaq.org/culturalServices.html

> The fact that they are taking care of everybody, I really enjoy that and I love seeing that, and I got to be a part of it this year, with fishing … I went out fishing and caught like 8 sheefish in a row and it was a lot of fun, but I only kept 1 for myself and I got to give the rest away and it was really fun being able to be a part of that community … involvement, and you pass out fish and you know being a part of their culture is something that I feel is really important and something that I feel like everyone should do if they are living here. (SHG04030713)

Beyond sharing within the community, respondents also reported exchange relationships with households in other communities. Shungnak had the greatest number of ties with the hub community of Kotzebue (22), as shown by that community's central position within the diagram. Households also reported several ties with the other upper Kobuk communities of Ambler and Kobuk. In addition, respondents described sharing relationships with 12 other communities, many in northwest Alaska.

Figure 3-23 depicts the Shungnak wild foods network with individual households collapsed into groups by household maturity types and types of heads. Their average harvests are represented by the size of the symbols. Elder and mature households, on average, harvested more wild food (by edible weight) than developing households. On average, elder households had larger numbers of food sources (13.7) in comparison with mature (12.6) and developing households (12.5). Mature households were a greater source of support for elder households than developing households, and elder households provided support for mature and developing households equally. All three household age groups had, on average, similar sources of support from other communities.

Looking at household structures, couple households had much higher harvest levels than either single female-headed households or single male-headed households. Single female-headed households harvested more than their single male-headed household counterparts. Couple and single male-headed households had larger numbers of food sources than single female-headed households, and single male-headed household had the most food sources from other communities. Couple headed households, on average, were named as a source of support more often than households headed by single people.

Comparing Harvests and Uses in 2012 with Previous Years

Harvest Data

Changes in the harvest and use of resources by Shungnak residents can also be discerned through comparisons with findings from other studies. The earliest survey effort was undertaken by the Division of Subsistence in 1993 and focused on migratory bird harvests (Wolfe and Paige 1995). Large land mammal surveys were administered in 1998[10] and 2008 (Braem 2012). A comprehensive survey conducted by the division for 2002 provides 1 point of direct comparison for all resource categories (Magdanz et al. 2004). AFD&G also collected salmon harvest information in Shungnak from 1994 to 2004.

The Division of Subsistence conducted household surveys for salmon in Kotzebue Sound communities, including Shungnak, from 1994 to 2004 (Figure 3-24). These data points allow for a direct comparison of overall harvest numbers, but unfortunately per capita information is not available from these surveys. Shungnak residents caught an annual average of 4,958 chum salmon over the 11 years surveyed. This study's estimate of 2,595 harvested chum salmon is 48% lower than the 11-year average and represents the lowest recorded harvest, which is consistent with respondent comments. Low harvest numbers both historically and during this harvest year indicate that Shungnak residents do not heavily harvest other species of salmon.

10. Georgette, S. Subsistence harvests in northwest Alaska: caribou, moose, bear, wolf, and wolverine, May 1998 through April 1999. Alaska Department of Fish and Game, Division of Subsistence, unpublished report. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

The comprehensive survey effort for 2002 offers a more direct comparison with harvest levels during the 2012 study year because it includes per capita harvest information, which controls for human population differences (Magdanz et al. 2004). In 2002, Shungnak residents harvested an estimated 3,810 chum salmon, which provided 22,858 lb to the total estimated harvest in that year; in contrast, the harvest in 2012 was an estimated 2,595 chum salmon (14,747 lb) (Table 3-3; Figure 3-25). This resource provided 92 lb per capita in 2002, in comparison with 54 lb per capita in 2012. As mentioned previously, residents overwhelmingly reported 2012 to be a poor fishing year due to heavy rainfall and high water in the Kobuk River. Because of these environmental conditions, it is difficult to know if 2012 was an anomalous year, or if other factors may be influencing harvests over time. Some key respondents felt that there were greater numbers of chum salmon on the Kobuk River in their youth (SHG01071913; SHG01030613; SHG02030713), while others felt the population was fairly stable. Rates of use and sharing of chum salmon among Shungnak households appear to have remained stable between the 2 comprehensive surveys despite much lower harvest levels in 2012. Only 37% of households harvested chum salmon in 2012, while 57% of households harvested the resource in 2002. However, use rates were similar between the study years (76% in 2002, 78% in 2012), and more households received chum salmon in 2012 (65%) than in 2002 (53%). Sharing rates may have increased in order to accommodate for fewer households harvesting salmon, or households may have chosen to share despite lower harvest levels.

The Division of Subsistence salmon surveys from 1994–2004 also recorded harvests of sheefish; harvests of other whitefish species in Shungnak were recorded from 1997–2004 (Figure 3-26). As in the case of salmon, a direct comparison of per capita harvests is not possible; also, species of whitefish were not differentiated in the 8 years for which data are available, except for sheefish. For the 11 years of available data, Shungnak households caught an annual average of 1,499 sheefish. Sheefish harvest levels in 2012 (1,156 fish) were similar to the 11-year average and higher than the numbers caught in 1996 (924 fish), 1997 (1,120 fish), 2000 (850 fish), and 2001 (947 fish). During the 8 years of whitefishes surveys, Shungnak households harvested an average of 11,681 whitefishes. In contrast, whitefishes harvest levels in 2012 (2,778 fish) were significantly lower than the average for the postseason surveys and 41% lower than the lowest harvest year on record (4,724 fish in 2001).

The 2002 comprehensive survey offers a greater level of comparison in terms of per capita harvest especially in terms of individual whitefish species (Magdanz et al. 2004). In 2002, Shungnak residents harvested an estimated 2,020 sheefish, compared to 1,556 in 2012[11] (Table 3-3). Whitefish harvests, excluding sheefish, were much higher in 2002 in comparison with 2012 harvest levels; in 2002, Shungnak residents harvested an estimated 47,030 lb of whitefishes, in comparison with only 5,479 lb in 2012. Per capita harvests of whitefish species were 189 lb in 2002 and only 20 lb in 2012. The stark difference between the study years can be seen by comparing individual species. In 2002, residents harvested an estimated 5,580 lb (22 lb per capita) of broad whitefish, compared with 2,842 lb (10 lb per capita) in 2012. Humpback whitefish harvests showed the largest difference: in 2002, Shungnak harvested an estimated 40,615 lb (163 lb per capita), compared with only 1,386 lb (5 lb per capita) in 2012. As mentioned above, heavy rains and high water on the Kobuk River had a severely negative impact on fishing in the community. As was the case with salmon, it is difficult to determine if 2012 was simply an anomalous year or if other factors have been impacting harvests over time, although several respondents said they felt the populations of whitefishes and sheefish were generally stable (SHG03071813; SHG01030613). A few respondents did point out concerns over the numbers of whitefishes (SHG01071913; SHG02030713). One felt that the fish are not as "fat" and healthy as they once were (SHG07071913).

11. Conversion factors between the 2 study years were different for sheefish. The 2002 study estimated 5.5 edible pounds per sheefish, and this study year used a conversion factor of 11.14 lb (which the authors believe to be more accurate). As such, a direct comparison of per capita harvest levels is not possible for this resource. If the 2012 conversion factor is applied to the 2002 study, Shungnak residents harvested 90 lb per capita in comparison to 63 lb in 2012.

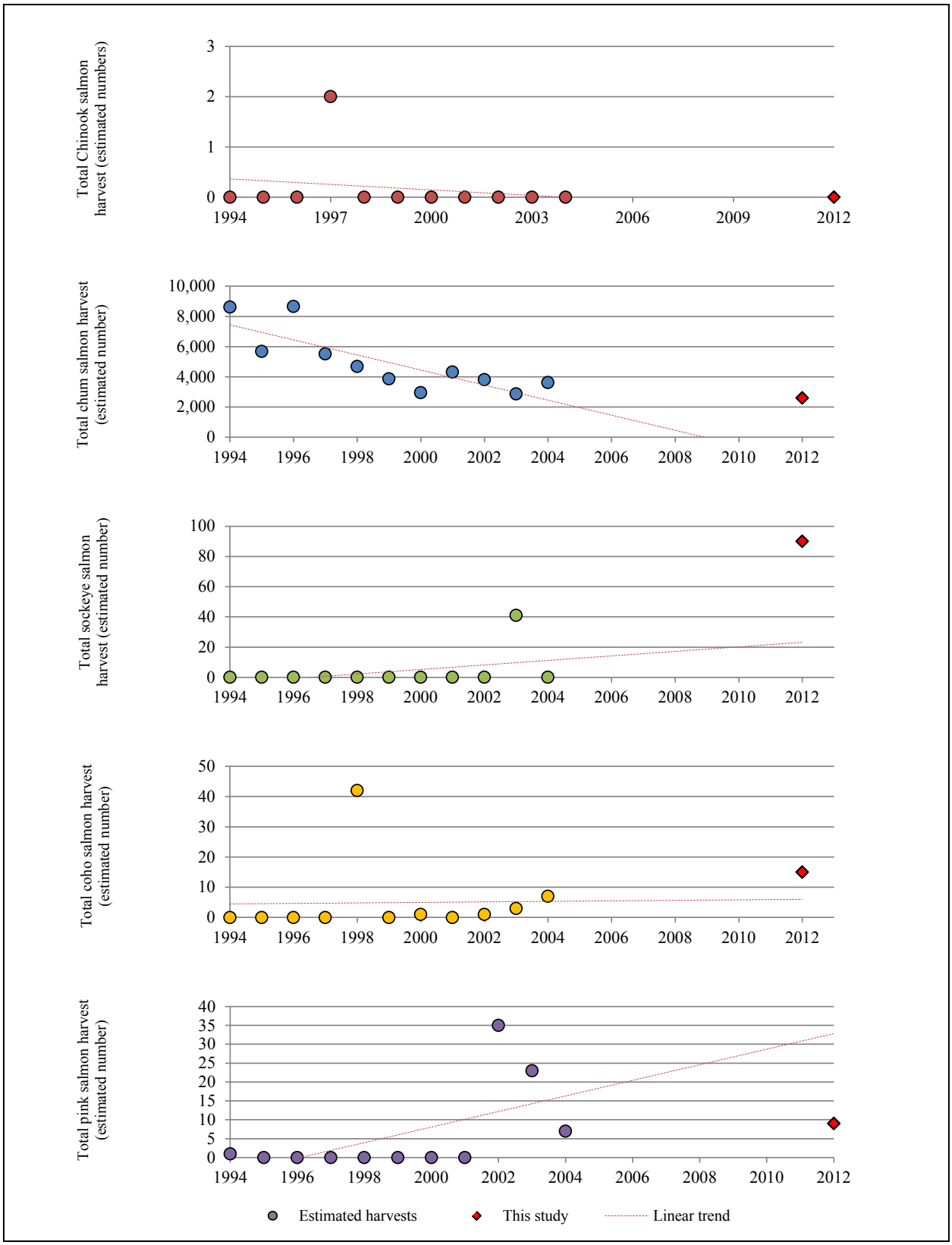

Figure 3-24.–Estimated number of salmon harvested, Shungnak, 1994–2004 and 2012.

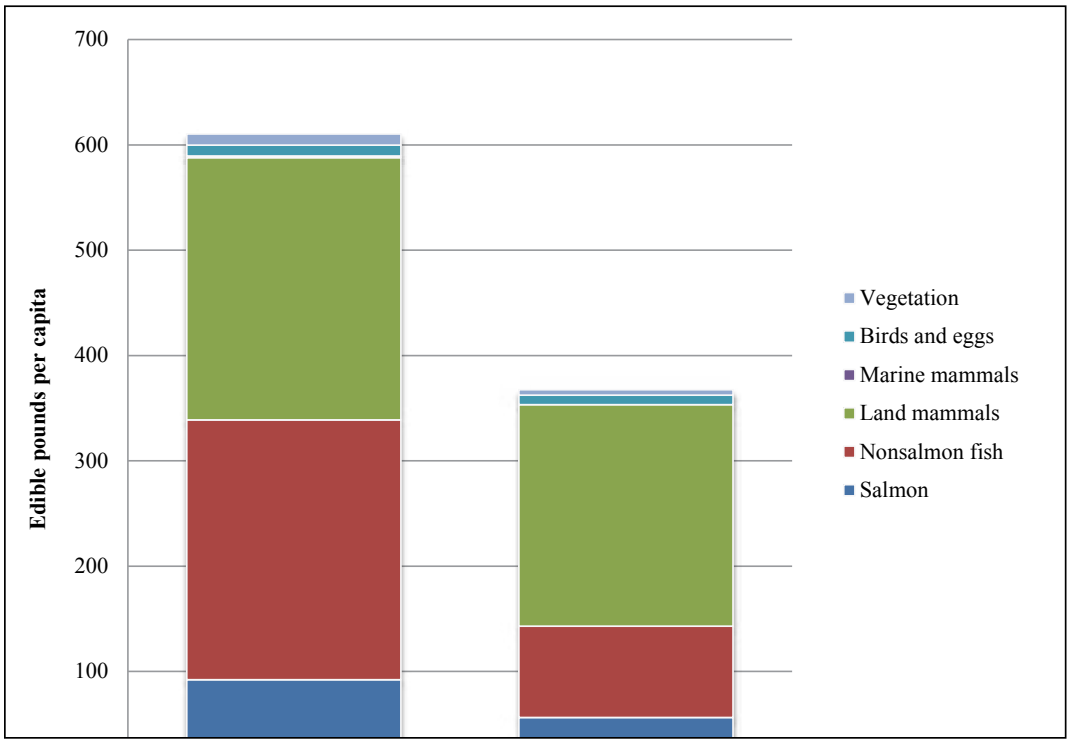

Figure 3-25.–Harvest composition in edible pounds per capita, Shugnak, 2002 and 2012.

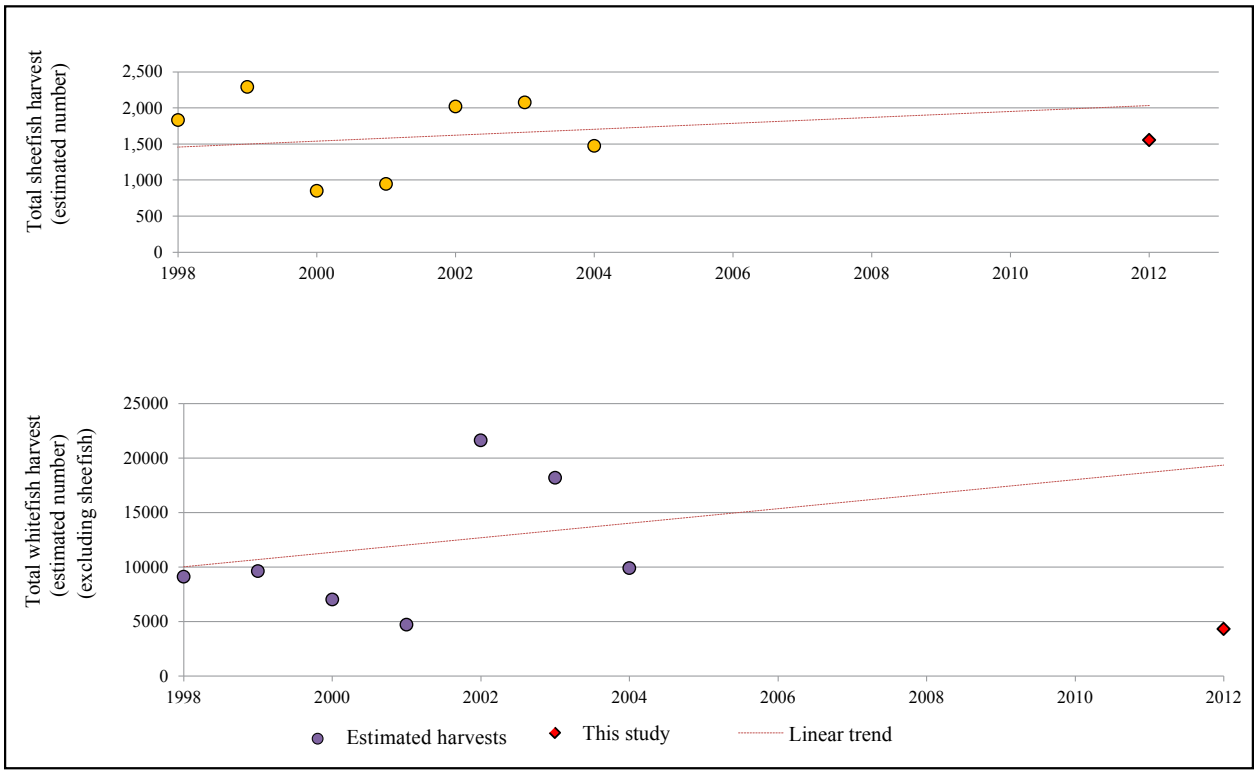

Figure 3-26.–Estimated number of sheefish and whitefishes harvested, Shungnak, 1998–2004 and 2012.

There are 3 points of comparable data for land mammal harvests in Shungnak for the 2012 data in this study, including the 2002 comprehensive survey effort and large game surveys conducted in 1998[12] and 2008 (Braem 2012) (Figure 3-27).

The total number of caribou harvested by Shungnak residents has remained fairly stable since 2002, ranging from 396 to 406 animals during the 3 study years; in contrast, in 1998, the community harvested 561 caribou (42% more than in 2012). Per capita harvests have shown a slight decline over time, ranging from 312 lb per capita in 1998[13], 220 lb in 2002, 218 lb in 2008, and 196 lb during the 2012 study year (Braem 2012; Magdanz et al. 2004) (Table 3-4). It is difficult to determine whether 1998 was simply a particularly good year, or if caribou harvests have indeed declined. During the 1998 study year, residents in Shungnak noted that there had been more caribou in the area in the past several years than was usual. Use and harvest rates have shown a slight decline as well in the 4 study years, ranging from 100% of households using caribou and 72% actually harvesting the resource in 1998[14], to 94% of households using caribou and 48% harvesting the resource in 2012 (Braem 2012; Magdanz et al. 2004) (Table 3-4). Interestingly, rates of sharing did not decrease with fewer households harvesting caribou; the highest percentage of households reported receiving the resource (74%) in 2012 in comparison with other study years. It is possible that variations in harvest levels may simply be due to natural fluctuations in caribou migration patterns and the level of access to this resource near the village. One respondent commented that the uncertain timing caused by the caribou arriving later than usual has made hunting more challenging (SHG03071813).

Moose harvests have also shown some decline over time. As is the case with caribou, however, limited data increase the difficulty of pinpointing whether this is an overall trend. Overall harvests of the resource range from a high of 21 moose in 1998 to a low of 5 moose in 2012 (Figure 3-27). Per capita harvests showed a similar decline over the 4 study years; in 1998, Shungnak residents harvested 46 lb per capita, compared with only 9 lb per person in 2012[15] (Braem 2012; Magdanz et al. 2004) (Table 3-4). Use rates for moose have remained fairly steady over the 4 study years, although 2012 saw the lowest percentage of households actually harvesting the resource (7%). Despite the lower harvest numbers in 2012, key respondents felt the moose population was steady, and that there are a lot of the animals in the area (SHG01071913; SHG01030613; SHG05071713). One key respondent did say that moose hunting was more difficult in 2012 due to high water on the river. “All the moose were in the lakes, tundra, they were off that river because it was too high. Eating off the lakes instead of the river” (SHG05071713).

Black and brown bear harvests have remained fairly steady over the course of the 4 study years. Black bear harvest numbers ranged from lows of 2 black bears in 2002 and 2008 to a high of 4 black bears in 1998 (Figure 3-27). Per capita harvests for all 4 study years were less than 2 lb per person[16] (Braem 2012; Magdanz et al. 2004). Brown bear harvests ranged from no harvest of brown bear during the 2012 study year to highs of 2 bears harvested in 2002 and 2008.

Gray wolf harvests over the 4 study years have shown more variation, but no real indication of an overall trend. Wolf harvests ranged from a low of 7 wolves in 2002 to high of 18 in 1998. As mentioned previously,

12. Georgette, S. Subsistence harvests in northwest Alaska: caribou, moose, bear, wolf, and wolverine, May 1998 through April 1999. Alaska Department of Fish and Game, Division of Subsistence, unpublished report. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.
13. Georgette, S. Subsistence harvests in northwest Alaska: caribou, moose, bear, wolf, and wolverine, May 1998 through April 1999. Alaska Department of Fish and Game, Division of Subsistence, unpublished report. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.
14. Georgette, S. Subsistence harvests in northwest Alaska: caribou, moose, bear, wolf, and wolverine, May 1998 through April 1999. Alaska Department of Fish and Game, Division of Subsistence, unpublished report. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.
15. Georgette, S. Subsistence harvests in northwest Alaska: caribou, moose, bear, wolf, and wolverine, May 1998 through April 1999. Alaska Department of Fish and Game, Division of Subsistence, unpublished report. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.
16. Georgette, S. Subsistence harvests in northwest Alaska: caribou, moose, bear, wolf, and wolverine, May 1998 through April 1999. Alaska Department of Fish and Game, Division of Subsistence, unpublished report. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

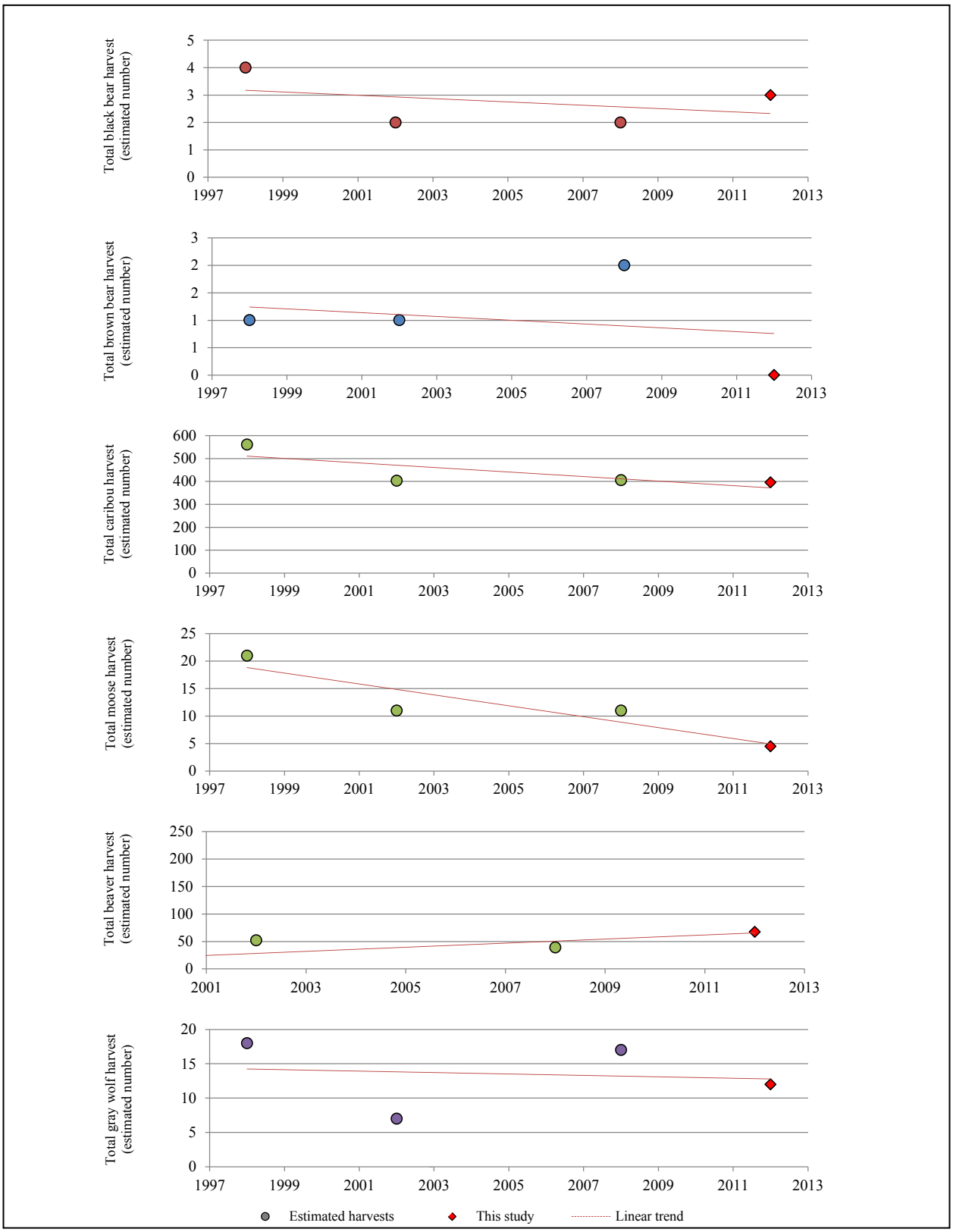

Figure 3-27.–Estimated number of black bear, brown bear, caribou, moose, beaver, and gray wolf harvested, Shugnak, 1998, 2002, 2008, and 2012.

Shungnak hunters generally harvest wolves opportunistically. Several respondents did observe that the wolf population in the area has increased substantially in recent years (SHG01071913; SHG02030713; SHG03071813). One key respondent connected this increase to hunting effort: "Nowadays hardly anybody hunt them, you know, I don't know why … And the population is growing" (SHG05071713). Although the 2012 harvest of 12 wolves was not the lowest number harvested during the 4 study years, the lowest percentage of households (7%) harvested this resource during the 2012 study year[17] (Braem 2012; Magdanz et al. 2004).

The 2002 comprehensive survey (Magdanz et al. 2004) and the 2008 large game survey (Braem 2012) provide the only points of comparison for beaver harvests. With so few data points, it is not possible to make any generalizations about the overall harvest patterns. However, harvests have been fairly consistent between these 3 years; Shungnak residents harvested 52 beavers (4 lb per capita) in 2002, 39 beavers (3 lb per capita) in 2008, and 68 beavers (4 lb per capita) in 2012. Key respondents noted that the population of beavers in the area has increased greatly over time. Beavers have blocked some sloughs near Shungnak and have built more dams on the mainstem of the Kobuk River (SHG03071813; SHG01071913; SHG01030613). One respondent expressed concerns over the impact of beaver dams on fish populations, citing that fish "can't come out from the lakes" through the blocked sloughs (SHG07071913).

The 2 points of comparison to the 2012 harvest of birds and eggs include a 1993 migratory bird survey[18] and the 2002 comprehensive survey (Magdanz et al. 2004). Overall, harvest and use of bird species has decreased over the 3 study years, which span almost 2 decades. In 1993, Shungnak residents harvested an estimated 4,345 lb (18 lb per capita) of bird and eggs[19]; in 2002, the harvest was 2625 lb (11 lb per capita); and during the 2012 study year, residents harvested an estimated 2,501 lb (9 lb per capita) (Magdanz et al. 2004; Table 3-6). Household use rates for these resources have also dropped slightly over the years; in 1993, 86% of households reported using birds, compared with 72% using birds and eggs in 2012.

Total estimated and per capita harvests of migratory and other birds have declined over the 3 study years. Shungnak residents harvested an estimated 3,921 lb (16 lb per capita) of migratory birds in 1993[20], 2,361 lb (9 lb) in 2002 (Magdanz et al. 2004:33), and 2,349 lb (9 lb per capita) of waterfowl in the 2012 study year (Table 3-6). Harvests in 2012 were 40% lower than the 1993 study year. Harvests of other birds, principally ptarmigan, showed similar declines over the course of the 3 study years; harvests of ptarmigan in 2012 (an estimated 141 lb) were 67% lower than in 1993 (421 lb). Despite this decline, key respondents felt that the overall number of birds had not changed much in the course of their lifetimes. One respondent felt that the population of black scoters had decreased in recent years and that the population of snow geese had increased around Shungnak (SHG01030613). Black scoter harvests were indeed lower in 2012 (an estimated 103 lb, 0.4 lb per capita) in comparison with 1993 (267 lb, 1 lb per capita). Snow geese harvests by weight were slightly higher overall in 2012 (30 lb) than 1993 (18 lb), but per capita harvests were lower in 2012.

The 2002 comprehensive survey is the only other point of comparison for vegetation harvests with the 2012 study year. However, because the 2002 study only reported vegetation in terms of berries and other plants, only general categories can be compared. Overall, Shungnak residents reported harvesting 2,529 lb of vegetation (10 lb per capita) in 2002, compared to 1,438 lb (5 lb per capita) in 2012 (Magdanz et al. 2004; Table 3-8). In both study years, berries made up the bulk of the vegetation harvest; in 2002, berries composed 94% of the plant harvest, and in 2012 they composed 90%. With only 2 points of comparison,

17. Georgette, S. Subsistence harvests in northwest Alaska: caribou, moose, bear, wolf, and wolverine, May 1998 through April 1999. Alaska Department of Fish and Game, Division of Subsistence, unpublished report.
18. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." Accessed August 18, 2014. https://www.adfg.alaska.gov/sb/CSIS
19. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." Accessed August 18, 2014. https://www.adfg.alaska.gov/sb/CSIS
20. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System: CSIS." Accessed August 18, 2014. https://www.adfg.alaska.gov/sb/CSIS

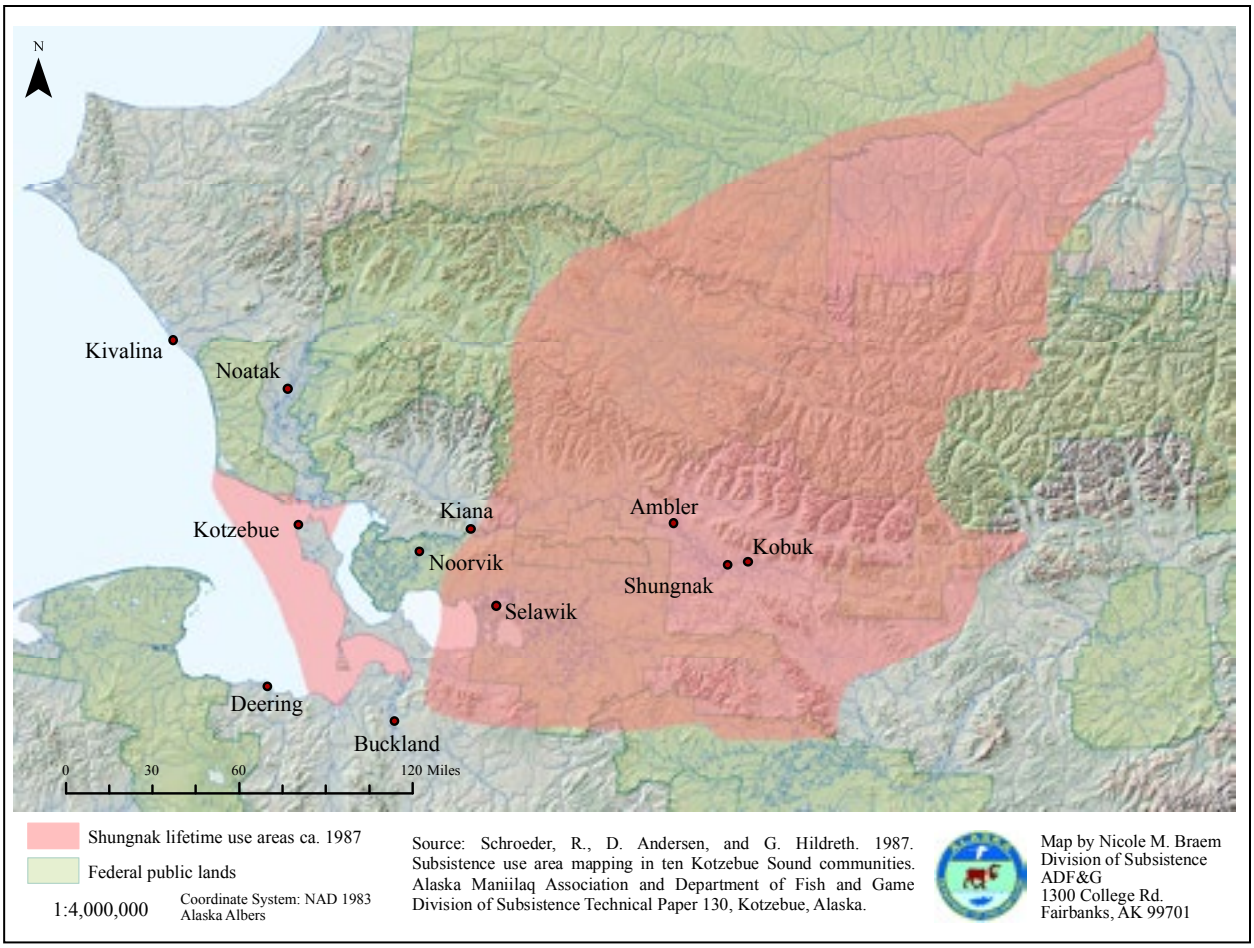

Figure 3-28.–Lifetime use areas, Shungnak, 1987.

it is not possible to infer any changes in harvest patterns in the decade between the studies. Additionally, Shungnak residents reported that 2012 was a poor berry year due to the heavy rains during the summer months.

Current and Historical Harvest Areas

Historical harvest information for Shungnak can be found in a 1986–87 study conducted by the Division of Subsistence in which 40 community residents described areas used for harvesting particular resources throughout their lifetimes living in the community (Schroeder et al. 1987). Figure 3-28 depicts these lifetime use areas, which span a considerable geographic distance. Use areas reported in this previous study included sections of Kotzebue Sound, a radius of use around the Kobuk River from Noorvik upriver to approximately 50 miles upstream of Kobuk, and north into the foothills of the Brooks Range. In comparison with the 2012 study year, the historical search and harvest areas are considerably more expansive. However, this study was only seeking to map search and harvest areas used during the 2012 study year. The lifetime use area mapping included hunters who were active during the 1986–87 study year as well as elder respondents.

Local Comments and Concerns

Following is a summary of local observations and concerns voiced during the household surveys, the key respondent interviews, and the community review of preliminary data. Concerns and observations are rarely shared equally among community members, and summaries in this report do not imply that this list is either comprehensive or unanimous. However the issues described here were common and provide important points of discussion. For a full list of the comments and concerns provided by survey respondents, see Table D3-15.

Climate

Many key respondents discussed the environmental changes they had witnessed over their lifetimes. Although the rainy summer and fall of 2012 brought high water on the Kobuk River, respondents mentioned that in recent years, shallower waters have also presented a challenge to traveling along the river. Respondents explained that the main channel of the river used to flow next to the community, but that in the last 10 years the northeast side has become the dominant side. Sometimes the shallowness of the water forces residents to park their boats along the dominant channel further from town, instead of along the beach in front of Shungnak, which necessitates a longer trip around the sandbar and the use of more gasoline (SHG01071913; SHG02030713). Other respondents noted that there has been less snow in recent years than usual, hampering travel by snowmachine and contributing to the low river levels (SHG03071813). Respondents also indicated that changing weather in the region has brought warmer temperatures, later freeze-ups, and earlier breakups on the Kobuk River (SHG03071813; SHG02030713). One resident explained the impacts of weather changes:

> The weather, we can tell where you should be solid ground, like even now when the, even it take a boat ride up to Kobuk, you can see these, uh, you know right by the bank, it's eroding. You know, under and this big tundra is hanging out to the river because it's melting in there, and you see that all the way up to camp. Where there's big sections gone. (SHG02030713)

As mentioned previously, residents described 2012 as a terrible fishing year due to heavy summer and fall rains. Setnets were difficult to place in fast-moving eddies, and the rain made drying fish problematic (SHG03071813; SHG01071913; SHG06030513; SHG01030613). Indeed, the Alaska Climate Research Center stated that precipitation was about 200% above normal levels in August 2012.[21] A comparison of overall harvest levels by Shungnak residents in 2002 and during the study year offers insight into the impact of the poor fishing season on the community in 2012. Residents of Shungnak harvested an estimated 151,911 lb (610 lb per capita) of wild resources in 2002 (Magdanz et al. 2004), compared with 100,872 lb (367 lb per capita) in 2012; the 2012 harvest was 34% lower than the total harvest in the 2002 study year. In 2002, fish species contributed an estimated 84,340 edible pounds and composed 56% of the total estimated harvest in that year; in sharp contrast, Shungnak residents harvested an estimated 39,253 lb of fish in 2012, which accounted for 39% of the harvest.

Key respondents overwhelmingly highlighted the importance of caribou as a subsistence resource for their community. Although respondents did not feel that harvests had decreased over time, several mentioned that the timing of the migration has been later than usual over the past few years (SHG04030713; SHG06030513; SHG01071913). One respondent explained that they did not see caribou by their hunting camp in 2012:

> They must have been hanging around below Shungnak or by the airport. By the lakes back here, but still they wouldn't be going up river. They'd be by Bornite, by Kobuk, usually they'd be getting all that caribou, but I just wouldn't know why we wouldn't see them 'til November. And it's a little problem for us sometimes because you know we're hungry for that meat and stuff like that. (SHG06030513)

21. Alaska Climate Research Center, Fairbanks: "August 2012 Synoptic Summary." Accessed September 28, 2013. http://akclimate.org/Summary/Synoptic/2012/Aug

Indeed, ADF&G biologist Jim Dau noted that since 2000 caribou have been arriving at the Kobuk River 2 to 6 weeks later than usual (Rosen 2013). In 2013, National Park Service collared-caribou records show that the herd crossed the Noatak River far later than the 3 years for which data have been collected. The later timing of the migration may be due to the unusually warm autumn temperatures or a holdover from the late spring breakup, but no concrete conclusions can be made at this point. One respondent noted that the increasingly uncertain timing of the caribou migration has made hunting more difficult (SHG03071813).

Development

Survey respondents held varying opinions as to the potential impacts and consequences of the proposed Ambler Mining District road. Several respondents mentioned that the road could be of benefit to the community in the form of lower shipping costs for fuel and supplies. In many cases, these opinions were offered by the same respondents who expressed concern about the changes road access might bring to subsistence activities and the resources upon which residents depend. Several households mentioned concerns over the potential impacts of the road and increased mining activity on caribou migration patterns. Some respondents worried about the possibility of increased access for nonlocal hunters and the potential burden this might place on populations of animals necessary for subsistence.

Cost of Commodities

Many key respondents were concerned about the high cost of living in Shungnak, particularly the impact of high gas prices on subsistence activities. One older key respondent noted that the advent of motorized vehicles made subsistence easier, but that dog teams had the advantage of never "breaking down" and that the cost of gasoline is an added burden to families (Plate 3-5) (SHG03071813). Another respondent explained that gas prices had "sky-rocketed" in the last 3 years; prices peaked at the time of the survey at $10.59 per gal (SHG01030613). Respondents overwhelmingly mentioned the impact of the high cost of fuel

Charles Crabaugh Papers (UAF 2010-0107-00024), Archives, Alaska and Polar Regions Collections, University of Alaska Fairbanks

Plate 3-5.–Travel by dog team was common in the upper Kobuk River region until the advent of snowmachines. This photo depicts travel upstream from Shungnak on the Kobuk River in the late 1940s.

on subsistence pursuits, noting that people are not able to go as far as they once did and that some families are staying closer to town for fishing and other activities. Respondents also discussed other adaptions, which included staying at camps instead of commuting daily from Shungnak, and pooling money (SHG06030513; SHG04030713; SHG01030613; SHG03071813; SHG01071913). Despite the added challenge of high fuel costs, one respondent noted that the location of Shungnak is ideal in many respects:

> Shungnak is a good a place to hunt because there are a lot of islands here, and we don't have to go very far. As far as migratory animals and spawning fish like salmon and sheefish. We're lucky to have a river right next to our town. (SHG01030613)

The cost of ammunition, the cost of freighting in snowmachines and boats, and the high cost of store-bought foods were also among the economic concerns mentioned by key respondents.

UAF-201-107-80 Charles Crabaugh papers

Plate 4-1.–Residents in front of the Kobuk Post Office in 1949.

4. KOBUK

Seth J. Wilson

Community Background

The community of Kobuk is located along the north bank of the Kobuk River, 25 miles north of the Arctic Circle and 150 miles east of Kotzebue, the regional hub. It is within in the transitional climate zone, 150 ft above sea level. Temperatures average -10°F to 15°F during winter and 40°F to 65°F during summer. Temperature extremes have been recorded from -68°F to 90°F. Average precipitation is 17 in per year and snowfall averages 56 in (Plate 4-1). The Kobuk River drains from east to west and is typically ice free from the end of May through October.[1] The land supporting Kobuk is poorly drained and contains many oxbow lakes, ponds, and sloughs. It is covered by a mixed woodland of willows, alders, and stunted spruce trees. The Cosmos Hills and Asbestos Mountains to the north are clearly visible from the community.

> Everybody … before these villages were formed, everybody camp … they were nomadic. They camped every year. They camped all summer long to get their fish and whatever else upriver, and then would come down to either here or Shungnak for the winter. And I think there were some folks that just stayed. But I think when the store opened up here, they had only one store here which is [anonymous] grandpa. He was one of the miners I think that came up this way because we … Kobuk was a big village at one point with miners. There were … I have seen pictures of Kobuk where we had huge log cabins all along this place. (OBU01020913)

1. Alaska Department of Commerce, Community, and Economic Development (ADCCED) Division of Community and Regional Affairs, Juneau. n.d. "Alaska Community Database Online: Community Information." Accessed May 2014. http://commerce.alaska.gov/cra/DCRAexternal/community

Kobuk was established at its present site in 1899, at which time it was referred to as Shungnak. During the summer of that year, a large influx of miners ascended the Kobuk River to prospect its tributaries. Though the incursion was short-lived, prospectors near Shungnak discovered enough gold to stay (Anderson et al. 1977:51). By 1903, the site had become a supply depot for the miners. One post office and 2 trading posts were established. In 1905, the Yearly Meeting of Friends, a Quaker religious society, founded a school and mission. The school closed just 1 year later in 1906, but it attracted so many families from the surrounding Inupiaq population that the federal government reopened it in 1907. A reindeer herd was imported from Unalakleet stock to feed the new inhabitants.

Erosion and flooding, which have challenged the community since its formation, prompted some families to relocate 8 miles downriver around 1927 (Magdanz et al. 2004:2). "Oh, people always tell me that Kobuk was the first village, they were here and then they start moving down to Shungnak, and then from there from Shungnak to Ambler" (OBU02021013). Those who stayed changed the community name from Shungnak to Kobuk in 1928. The word "Kobuk" means "Big River" in Inupiaq, and refers to the river of the same name (Orth 1971rep:534).

Kobuk is located in the Northwest Arctic Borough; it incorporated as a second-class city in 1973. A federally recognized tribe, the Native Village of Kobuk, is located in the community. Health services are provided by a local clinic administered by the Maniilaq Association. The Northwest Arctic Borough School District operates 1 school. There are 2 privately owned stores in the community. Electricity is generated in nearby Shungnak. Some residences, but not all, have water and sewer utilities.

Kobuk is the last upriver community on the Kobuk River. It is connected to Shungnak by an 8-mile trail. Residents can reach other communities by air service, by boat via the Kobuk River, or by snowmachine during the winter. The community has a 4,020-foot state-maintained airstrip.

Most land surrounding Kobuk is managed by government agencies or owned by private corporations. The land bordering the community is primarily owned by NANA Regional Corporation, the regional corporation created under ANCSA. The State of Alaska manages lands located 6 miles to the east of the community. National Park Service conservation units include the Noatak National Preserve, the Gates of the Arctic National Park, and the Kobuk Valley National Park. The U.S. Fish and Wildlife Service manages the Selawik National Wildlife Refuge, which is located 6 miles to the south. Private individuals own a few parcels of land in the area; these are primarily owned through Native allotments.

Seasonal Round

Almost all subsistence resources are subject to seasonal availability and annual variability. Kobuk River residents direct their efforts according to an annual cycle, harvesting resources when they are available and prime.

The early spring brings lengthening sunlight and warmer temperatures. Residents target small groups of caribou wintering near the community. Migratory birds arrive to the upper Kobuk River area, providing hunters with further opportunity. In late April, returning geese reach Kobuk, and ducks follow shortly thereafter. Some residents hunt beavers and muskrats under the ice during this period. All hunting that occurs in the spring must be conducted prior to breakup when the ice becomes thin and snowmachine travel hazardous.

The elevated water produced by spring snowmelt prompts whitefish species to migrate from their wintering habitat in tundra lakes into the Kobuk River. Broad whitefish are the first species to do so, followed by humpback whitefish. During the summer season, salmon and nonsalmon fish species begin ascending the Kobuk River. Yet, due to the community's distance from the mouth of the river, residents must wait until midsummer for the first fish to come close. "There is a little period in there when we don't do anything, you know. Everybody just kind of hang out in June, and July. … I mean we can't fish" (OBU01020913). In late June, a second migration of whitefishes occurs as fish travel from coastal areas to the upper Kobuk River to spawn. Chum salmon, the only salmon species to be found in quantity near Kobuk, arrive in July after their

UAF-2003-24-214 Richard and Florence Collins Papers

Plate 4-2.–Men building a fish trap under ice diversion for winter fishing.

long migration from the coast. The last species to appear are sheefish that spawn in the upper Kobuk River, just upstream of the Pah River.

In late July, many households focus on collecting ripe berries and other types of vegetation. Hunting commences in August when caribou begin their southward migration. Hunting parties depart from Kobuk to intercept migrating groups at known locations. In September, hunters target moose and bears that inhabit the headwaters of the Kobuk. This is the season when large land mammals are at their fattest and are most desirable. While hunters are traveling, they also opportunistically harvest migratory birds. Fishing for whitefish species continues all the way through freeze-up.

After the river becomes solid, residents jig under the ice for nonsalmon fish species. In recent years, Kobuk residents have built a communal fish trap to catch burbot as they migrate up the river during the first months of winter (Plate 4-2). Other winter activities are contingent on the weather. Hunting is very limited, unless caribou are close to the community. Some residents trap for furbearing animals from November until March. Community members harvest wood continuously through the winter as a primary heat source.

Population Estimate and Demographic Information

Kobuk's population during the study period was estimated at 164 individuals occupying 36 households (Table 4-1). This estimate includes year-round residents who resided in Kobuk for at least 3 months during the 12-month study period in 2012. It also includes households that are located along the Kobuk River but use community facilities and services, such as the Kobuk post office or stores. Households had an average of 5 residents. Of the total population, 87% were Alaska Native. For a point of comparison, the Alaska

Table 4-1.–Demographic and sample characteristics, Kobuk, 2012.

Table 4-1.–Demographic and sample characteristics
Kobuk, 2012.

Characteristics	Community Kobuk
Sample achievement	
Sampled households	30
Eligible households	36
Percentage sampled	83.3%
Sampled population	137
Estimated population	164.4
Household size	
Mean	4.6
Minimum	1
Maximum	11
Age	
Mean	25.4
Minimum	0
Maximum	96
Median	20
Sex	
Estimated male	
Number	85.2
Percentage	51.8%
Estimated female	
Number	79.2
Percentage	48.2%
Length of residency	
Population	
Average	18.8
Minimum	0
Maximum	96
Household heads	
Average	32.5
Minimum	0
Maximum	96
Alaska Native	
Estimated households	
Number	25.2
Percentage	70.0%
Estimated population	
Number	142.8

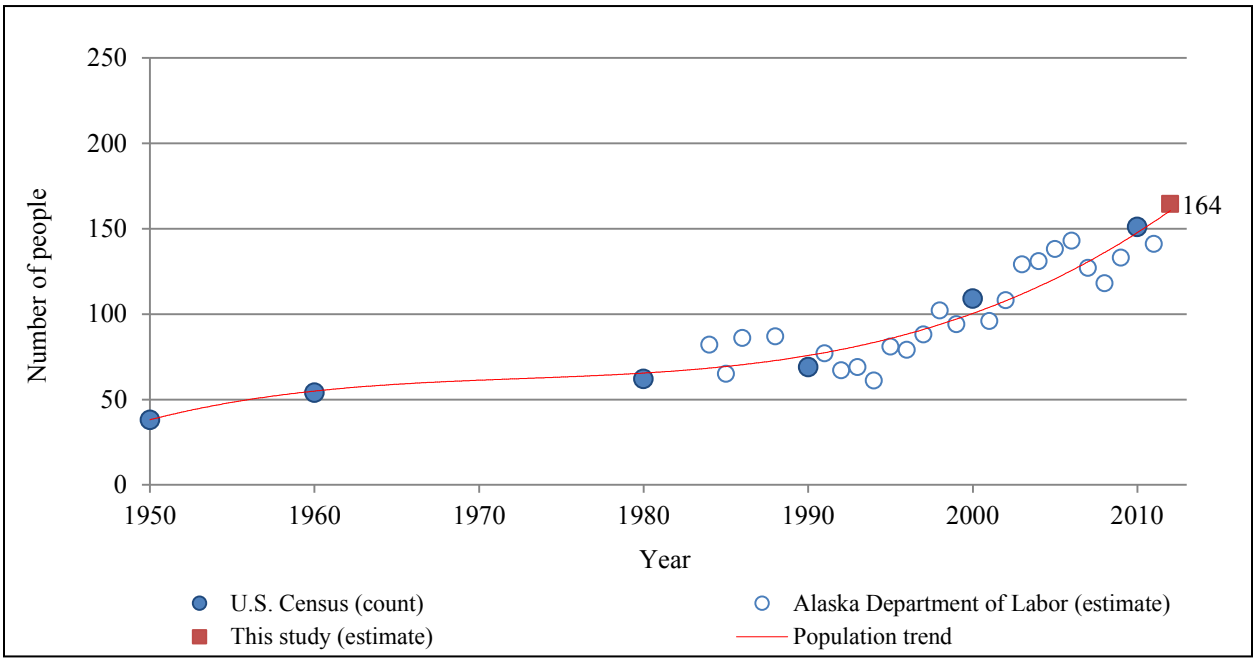

Figure 4-1.–Historical population estimates, Kobuk 1950–2012.

Department of Labor and Workforce Development (ADLWD) estimated the 2012 community population to be 141 individuals.[2] The dissimilarity between the 2 estimates may be due to different methods of population estimation.

Kobuk's population has experienced steady growth since at least 1950 (Figure 4-1). Some of this growth can be attributed to individuals relocating to the community from other communities. Approximately half moved to Kobuk from other communities; 16% moved from other parts of the United States, 11% have moved from either Shungnak or Ambler, and 9% have moved from lower Kobuk River communities (Table D4-1). Heads of households reported living in Kobuk an average of 33 years.

Kobuk's growth may be more recently influenced by an apparently high birth rate. Figure 4-2 shows the population profile of the community during the study year. The profile displays a bottom heavy pyramidal shape indicative of a growing population. The population can be described as fairly young. The median age in Kobuk is 20 years (Table 4-1). The largest cohort is between the ages of 0 and 4 (Figure 4-1). The second largest cohort of individuals is between 10 and 14 years. The smallest cohort is between 40 and 49 years of age, which is an age range that is usually highly productive in the subsistence economy (Wolfe 1981). The population is slightly skewed toward the male side with 52% male and 48% female.

Income and Cash Employment

The relationship between the cash and subsistence economies of Kobuk is fluid and dynamic. Monetary income gained through employment or transfer payments is often invested into the subsistence sector, and it positively influences households' ability to hunt, fish, and gather wild foods. Survey participants were asked, "Starting with the first head of your household, what job or jobs did he or she have last year?" For each job cited, respondents were asked the kind of work it entailed, the employer, in which months the job occurred, the schedule, and the gross income earned by the individual in that position. Respondents were

2. Alaska Department of Labor and Workforce Development (ADLWD), Juneau. n.d. "Research and Analysis Homepage: Places and Other Areas: Cities and Census Designated Places (CDPs), 2010–2013 (Excel)." Accessed May 2014. http://laborstats.alaska.gov/pop/popest.htm

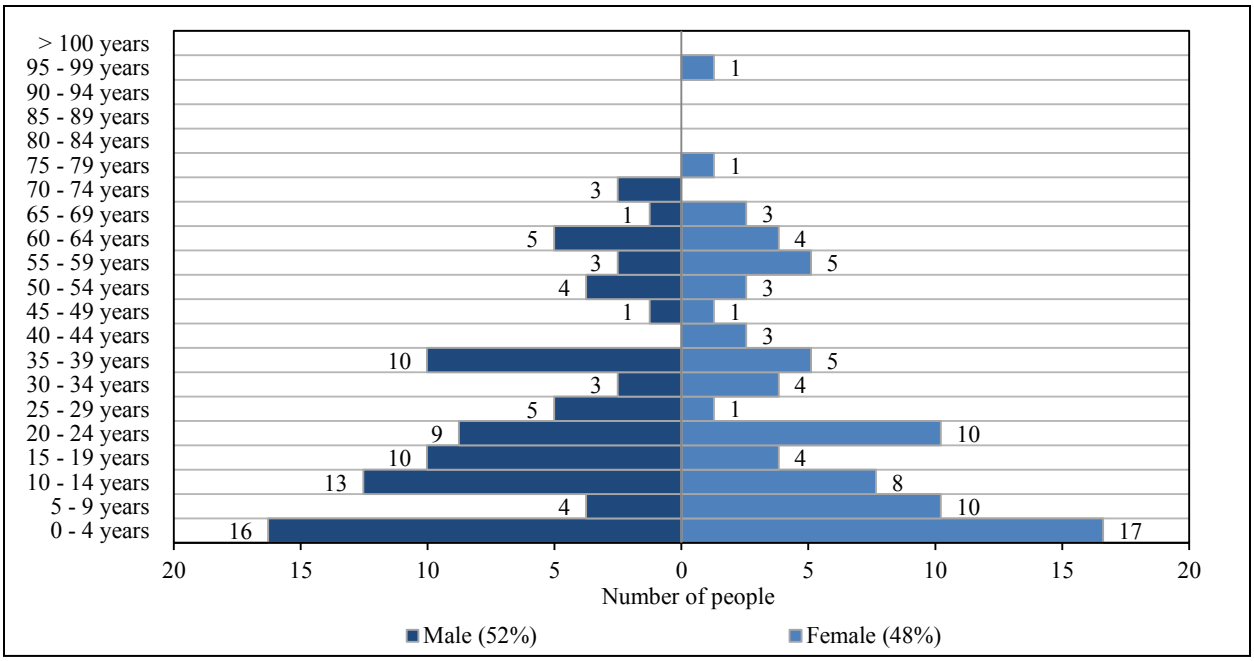

Figure 4-2.–Population profile, Kobuk, 2012.

also asked to identify sources of unearned income incurred by the household and list each source's annual contribution to the household's gross income.

Kobuk's total cash income during 2012 was an estimated $1,856,926 (Table 4-2). Earned income from employment constituted approximately $1,311,697, or about 71% of the total community income amount. Another $545,229 (29%) came from other income sources. The ratio of earned income to unearned income is very similar to the other 2 communities in this study (Table D1-1). Households earned an average of $51,581 during the study year, about $11,322 per capita. The median income was $41,878 (Table D4-2). The U.S. Census Bureau American Community Survey estimated a median household income of $30,313 for the years 2008–2012.[3]

This study categorized employment by economic sectors. Local government was the single greatest source of income, contributing $569,961 to the local economy (Figure 4-3; Table 4-2); this industry employed 36% of the working population. The service sector employed 16 individuals and contributed another $371,585, the second largest income amount. Work in the service sector includes employment by the NANA Regional Corporation—a large employer in the northwest region. Native corporation dividends contributed the largest amount of other income, a total of $166,484 received by 26 households. Almost every household received the Alaska Permanent Fund dividend, which accounted for the second largest source of other income for the community, an estimated $124,325. Mining contributed $115,989 to the local economy, constituting about 6% of the total earned income.

Alaska's mixed economy experiences seasonality. Top paying sectors rank so highly both because they pay highest and also offer full-time, year-round employment opportunity (Table D4-3; Table D4-4). Kobuk residents were employed for an average of 8 months out of the year. Only 35% of the adults in Kobuk were employed year-round. However, year-round employment does not necessarily mean full-time employment. Only about 59% of the jobs were full time. Of the remainder, 24% were part time, and 16% were on-call employment. In all, 68 persons reported having 78 jobs in 2012.

3. U.S. Census Bureau American Community Survey, Washington, D.C., n.d. "American FactFinder: Kobuk city, Alaska." Accessed May 2014. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

Table 4-2.–Estimated earned and other income, Kobuk, 2012.

Income source	Number of people	Number of households	Total for community	Mean per household[a]	Percentage of total[b]
Earned income					
Local government	24.0	17.4	$569,961	$15,832	30.7%
Services	15.6	13.7	$371,585	$10,322	20.0%
Mining	14.4	11.2	$115,989	$3,222	6.2%
Other employment	3.6	3.7	$88,294	$2,453	4.8%
Transportation, communication, and utilities	8.4	6.2	$72,760	$2,021	3.9%
Retail trade	2.4	2.5	–	–	–
Agriculture, forestry and fishing	1.2	1.2	–	–	–
Federal government	2.4	2.5	–	–	–
Manufacturing	1.2	1.2	–	–	–
Construction	1.2	1.2	–	–	–
Earned income subtotal	**67.6**	**34.8**	**$1,311,697**	**$36,436**	**70.6%**
Other income					
Native corporation dividend		26.4	$166,484	$4,625	9.0%
Alaska Permanent Fund dividend		34.8	$124,325	$3,453	6.7%
Food stamps		13.2	$61,445	$1,707	3.3%
Other		1.2	$48,000	$1,333	2.6%
Supplemental Security income		3.6	$28,125	$781	1.5%
Social Security		3.6	$25,128	$698	1.4%
Energy assistance		9.6	$21,870	$608	1.2%
Unemployment		8.4	$20,443	$568	1.1%
Pension/retirement		3.6	–	–	–
Rental income		1.2	–	–	–
Adult public assistance		2.4	–	–	–
CITGO fuel voucher		8.4	–	–	–
Longevity bonus		1.2	–	–	–
Child support		2.4	–	–	–
Meeting honoraria		1.2	–	–	–
TANF (temporary cash assistance for needy families)		0.0	$0.0	$0.0	0.0%
Workers' compensation/insurance		0.0	$0.0	$0.0	0.0%
Disability		0.0	$0.0	$0.0	0.0%
Veterans assistance		0.0	$0.0	$0.0	0.0%
Foster care		0.0	$0.0	$0.0	0.0%
Other income subtotal		**34.8**	**$545,229**	**$15,145**	**29.4%**
Community income total			**$1,856,926**	**$51,581**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2013.
Note "–" indicates that for confidentiality, income amounts are not listed for sources reported by fewer than 4 persons or households.
a. Means are based on all households in the community, not the number of households in the income category.
b. Income by category as a percentage of the total community income from all sources (wage-based income and non-wage-based income.)

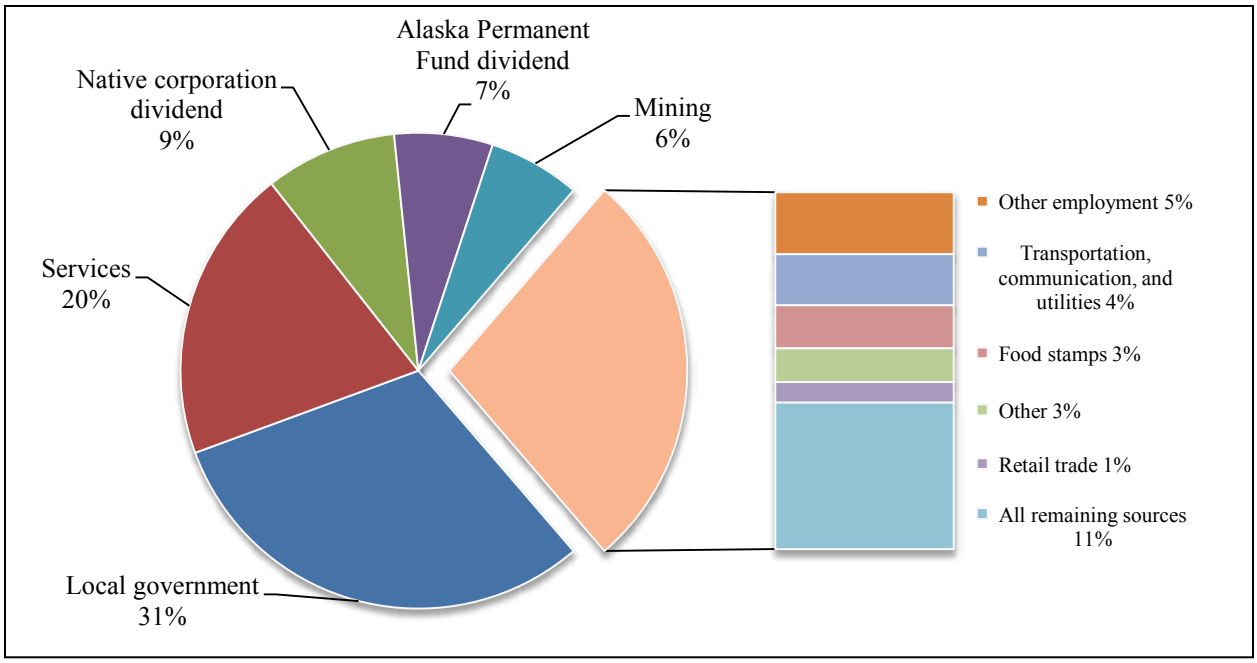

Figure 4-3.–Top 10 income sources, Kobuk, 2012.

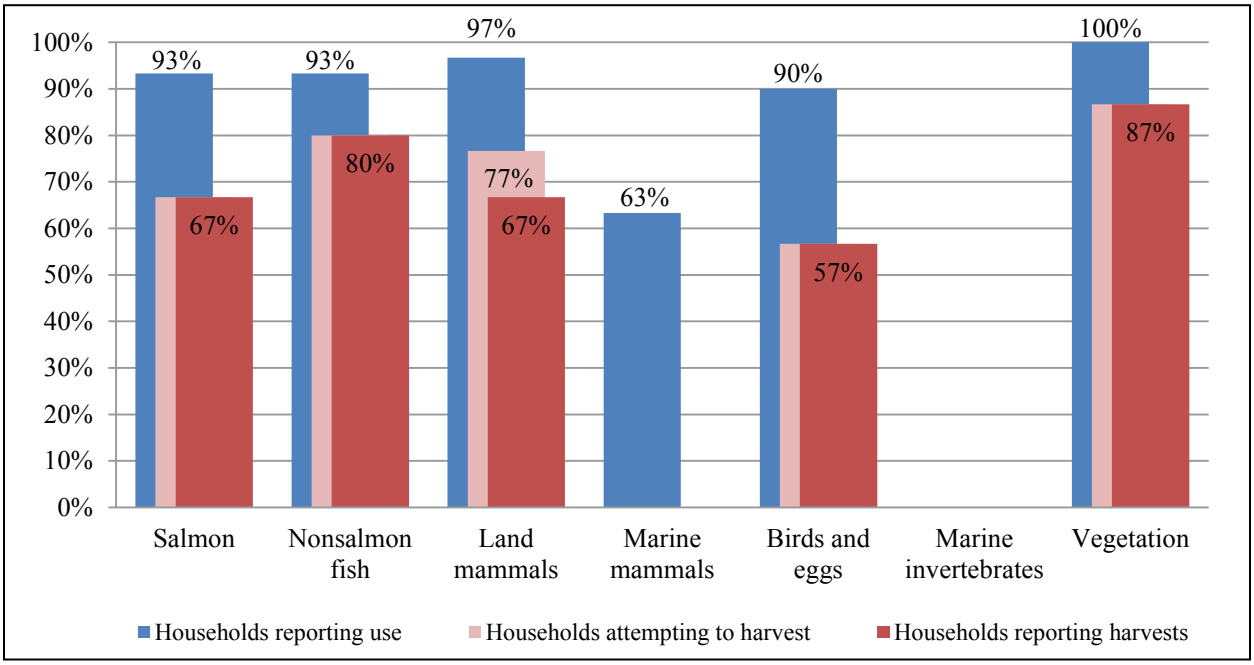

Figure 4-4.–Percentages of households using, attempting to harvest, and harvesting wild resources by category, Kobuk, 2012.

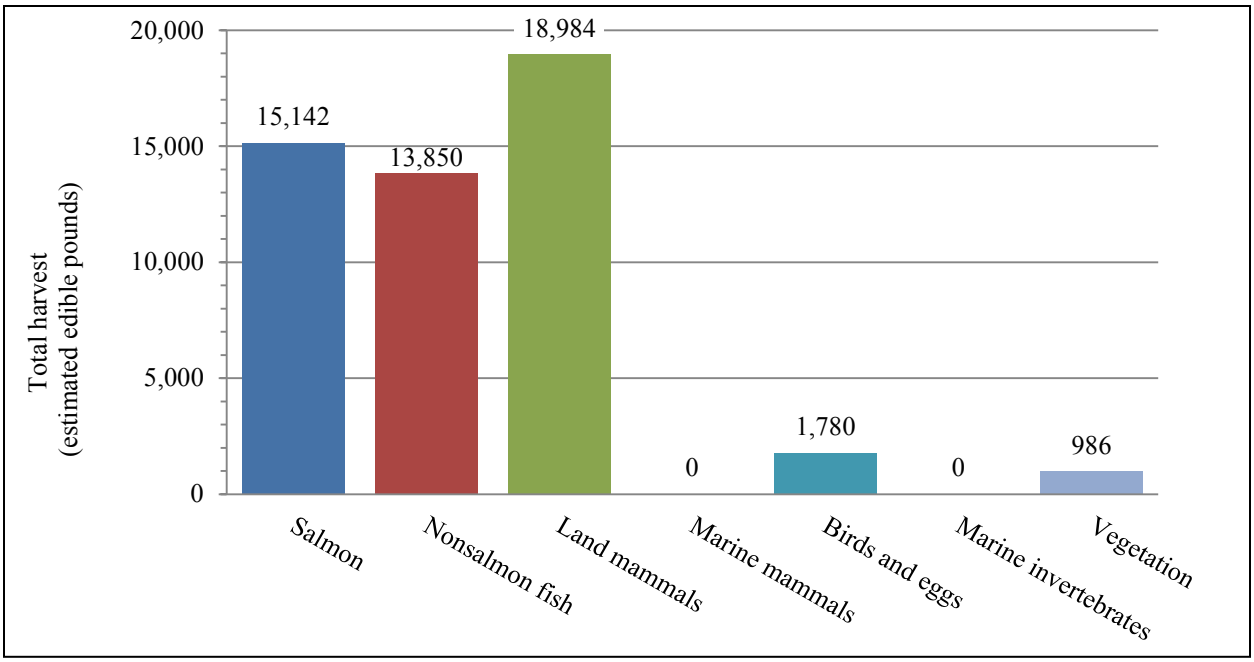

Figure 4-5.–Total harvest in estimated edible pounds, by resource category, Kobuk, 2012.

Summary of Harvest and Use Patterns in 2012

Table D4-5 summarizes resource harvest and use characteristics for Kobuk in 2012 at the household level. All households (100%) used wild resources in 2012, while 100% attempted to harvest and harvested resources. The average household harvest was 1,410 lb (usable weight) per household, or about 309 lb per capita. During the study year, households harvested an average of 9 kinds of resources and used an average of 15 kinds of resources. The maximum number of resources used by any household was 34. In addition, households gave away an average of 7 kinds of resources and 90% of households reported giving resources to other households.

Figure 4-4 shows by resource category the percentage of households that used, attempted to harvest, or harvested wild foods. Kobuk households reported a high reliance on woodland subsistence resources. Each resource category was used by more than 90% of the households, except marine mammal and marine invertebrate resources, likely due to the community's distance from the coast. Kobuk residents were relatively successful at harvesting most resources. All households that reported attempting to harvest salmon, nonsalmon fish species, birds and eggs, and vegetation also reported success in doing so. However, the lower percentage of households attempting to harvest land mammals than actually harvested those species suggests the challenges and uncertainty inherent in hunting. Lastly, though no households reported hunting marine mammals, more than half of the community used marine mammals, suggesting a strong trading relationship with coastal communities.

Resource Harvests and Uses by Category

The 30 surveyed households in Kobuk reported harvesting 41,593 lb of wild foods between February 1, 2012 and January 31, 2013. Expanding for unsurveyed households, Kobuk residents harvested an estimated 50,743 pounds (±24%) of wild foods.

Land mammals provided the greatest proportion of wild food in 2012, contributing 18,984 edible pounds for the community or 116 lb per person (Figure 4-5). The second largest source of food was from salmon species, which provided 15,142 lb or about 92 lb per person. The third largest component of the total harvest came from nonsalmon fish species, which contributed 13,850 lb of edible food or about 84 lb per person.

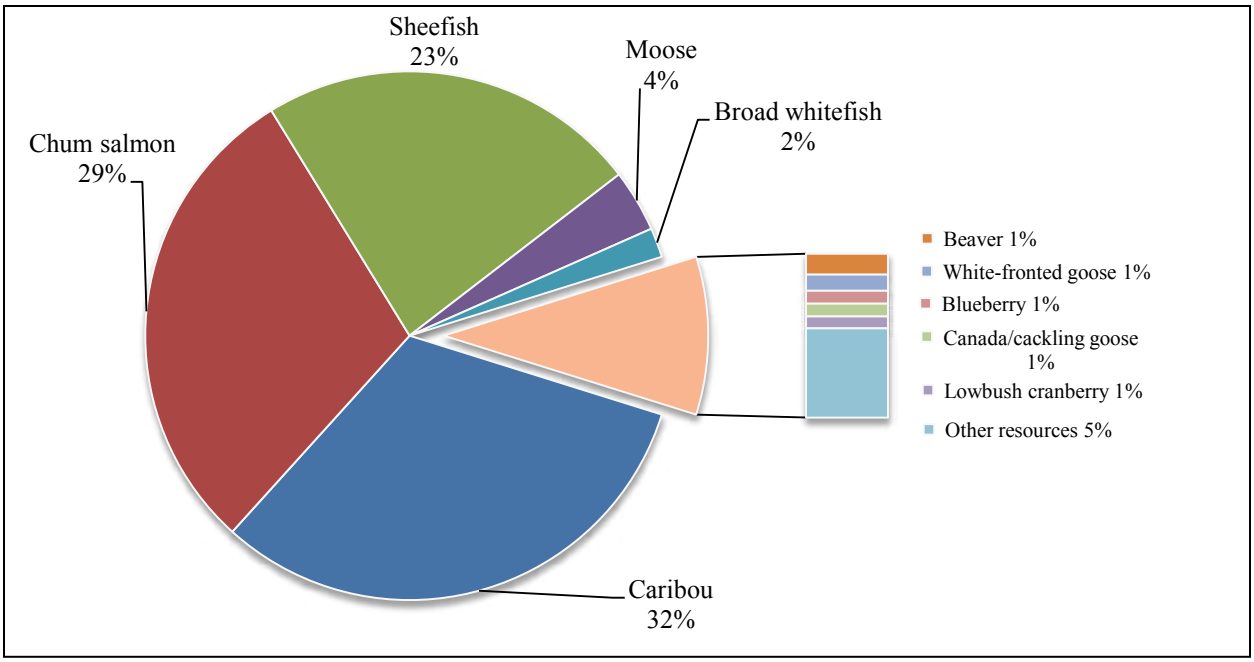

Figure 4-6.–Top 10 species harvested, ranked by estimated edible weight, Kobuk, 2012.

Lastly, birds and eggs and vegetation provided 1,780 lb (11 lb per person) and 986 lb (6 lb per person), respectively. There was no harvest of marine mammals or marine invertebrates.

Resource Harvests and Uses by Species

Figure 4-6 lists the top 10 resources harvested by Kobuk households during the study year. The subsistence resource base of Kobuk is diverse, and the top 10 species harvested represent resources from every resource category, except for marine mammals and marine invertebrates. Of the top 10 harvested species, 2 were large land mammals, 4 were fish, 2 were vegetation, and 1 was a migratory bird. The largest harvest weight for a species was from caribou, which composed 32% of the total community harvest by edible pounds. Chum salmon, the second most harvested resource, composed 29% of the total harvest. Both caribou and chum salmon were harvested in near equal edible weights, differing by about 1,185 lb. However, salmon likely played a smaller role in the diet of Kobuk residents because, as will be discussed in detail below, much of it was used for dog food. Sheefish accounted for 23% of the harvest—the third largest contributor. Moose, the largest species available to upper Kobuk River residents, made up 4% of the total subsistence harvest. The remaining resources were broad whitefish (2%), beavers (1%), white-fronted geese (1%), blueberries (less than 1%), Canada geese (less than 1%), and lowbush cranberries (less than 1%). All other resources not cited above contributed an estimated 2,667 lb to the diets of Kobuk residents and accounted for about 5% of the harvest.

Tables 4-3 through 4-8 report estimated wild resource harvests and uses by Kobuk residents in 2012; each table represents a resource category broken down by species. All edible resources are reported in pounds edible weight (see Appendix C for conversion factors[4]). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources harvested, given away, or used by any member of a household, and resources acquired from other harvesters, either as gifts, by barter or trade, or through hunting partnerships. Differences between harvest and use percentages reflect exchange among households, which results in a wider distribution of wild foods.

Kobuk residents used a combined 405 square miles of land when searching for subsistence resources (Figure 4-7). Residents primarily used the Kobuk River corridor between Onion Portage and the Pah River.

4. Resources that are not eaten, such as firewood and some furbearers, are included in the table but are given a conversion factor of zero.

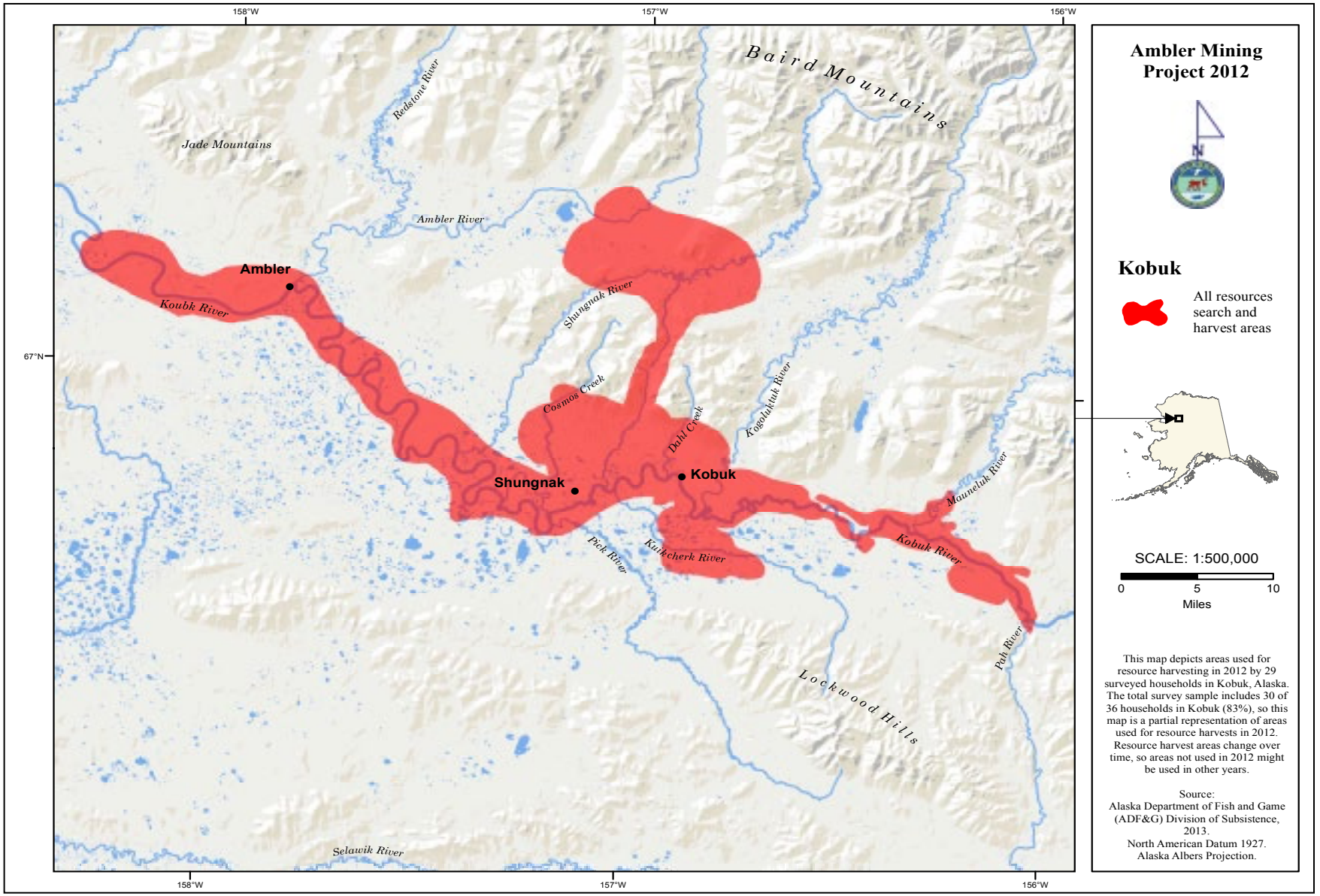

Figure 4-7.–All resources search and harvest areas, Kobuk, 2012.

This included the lower section of the Mauneluk, Kuikcherk, and Pick river tributaries. Kobuk residents also made use of the local trail system to search for subsistence resources northeast of the community, including Dahl Creek and Cosmos Creek. The road to Bornite mine provided further access to the north, where residents could utilize the middle section of the Shungnak River.

Salmon

Chum salmon accounted for 99% of the overall salmon harvest in Kobuk (Table 4-3). It was used by 90% of the households. During the study year, Kobuk fishers harvested an estimated 2,637 chum salmon totaling 14,988 lb. Sixty-seven percent of community households reported attempting to and successfully harvesting chum salmon. Approximately 53% of the households gave away chum salmon and 73% received it. A large quantity of chum salmon along with small amounts of Chinook and pink salmon were used for dog food (Table D4-6). Approximately 2,110 individual chum salmon were fed to dogs, or 80% of the chum salmon harvest. This number is likely inflated compared to other years. Many respondents reported that they were not able to adequately dry much of the salmon they harvested because of incessant rain. As a result, households fed spoiled salmon to dogs in order to avoid wasting the resource.

Chum salmon are targeted in late July and August when they first arrive and are often mixed with other fish stocks. "That's why I said we try and get 'em when they first come because that's when they're the best, a little bit fat on them at least" (OBU04020813). Because of the long distances they travel, the salmon that arrive near Kobuk are generally considered lean as compared to lower river community harvests. A lower fat content makes the fish most suitable for drying. This simple method of preservation is cheap, labor intensive, and contingent on suitable weather. "You can boil them, or we mostly dry them" (OBU04020813). Another respondent said:

> Well, we take the bellies out sometimes and freeze them like that. Just the belly part. And we eat the heads, boil the heads. And we boil the salmon, cut it up and boil it. We fry, we roast the belly part, or even the whole salmon sometimes. And cut a lot of it to dry. And eat it dried. … Last year, yeah, I didn't dry a single salmon. (OBU01020913)

Fishers incidentally caught small quantities of other salmon while targeting chum salmon and nonsalmon fish species. Coho salmon (14 individuals, 93 lb) were used by an estimated 13% of community households and harvested by 7%. Chinook salmon (4 individuals, 48 lb) were harvested by 3% of the households but not distributed: 0% of the sampled households reported giving any away. Lastly, few pink salmon were harvested (4 individuals, 13 lb) and shared (7% of households gave pink salmon to others). These 3 species of salmon together composed 1% of the total salmon harvest. Three percent of the households received sockeye salmon, though none were caught by community households.

Nonsalmon Fish

Although nonsalmon fish species were harvested in lesser quantities than salmon, they were nevertheless widely distributed and used (Table 4-3). For example, Kobuk fishers harvested an estimated 1,062 individual sheefish (11,833 lb), making sheefish the most harvested nonsalmon fish species during the study year (85% of the total nonsalmon fish species by weight). The sheefish harvest was used by 90% of the community households, similar to chum salmon. Every household that attempted to harvest sheefish (73%) successfully caught at least 1. Even with such high community participation, the resource was still widely exchanged between households. More than half of the households (53%) received sheefish. Sheefish were also fed to dogs (3,543 lb, 318 fish) (Table D4-6).

Other whitefish species were harvested in limited amounts. Broad whitefish accounted for 7% of the nonsalmon fish species category. Fishers harvested 286 broad whitefish, amounting to 914 total edible pounds (Table 4-3). Most of these (210) were used for dog food (Table D4-6). Fishers also harvested 157 humpback whitefish, totaling 330 lb. More Kobuk households used humpback whitefish (30%) than broad whitefish (23%), despite a much smaller harvest.

Table 4-3.–Estimated harvest and use of salmon and nonsalmon fish, Kobuk, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Fish										
Salmon										
Chum salmon	90.0%	66.7%	66.7%	73.3%	53.3%	14,988.3 lb	416.3 lb	91.2 lb	2,637.4 ind	± 38%
Coho salmon	13.3%	6.7%	6.7%	6.7%	6.7%	93.1 lb	2.6 lb	0.6 lb	14.4 ind	± 70%
Chinook salmon	3.3%	3.3%	3.3%	0.0%	0.0%	47.7 lb	1.3 lb	0.3 lb	3.6 ind	± 83%
Pink salmon	6.7%	6.7%	6.7%	3.3%	6.7%	13.1 lb	0.4 lb	0.1 lb	3.6 ind	± 61%
Sockeye salmon	3.3%	0.0%	0.0%	3.3%	3.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown salmon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**93.3%**	**66.7%**	**66.7%**	**80.0%**	**56.7%**	**15,142.1 lb**	**420.6 lb**	**92.1 lb**	**2,659.0 ind**	**± 38%**
Char										
Dolly Varden	16.7%	13.3%	13.3%	6.7%	6.7%	130.7 lb	3.6 lb	0.8 lb	39.6 ind	± 68%
Lake trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**16.7%**	**13.3%**	**13.3%**	**6.7%**	**6.7%**	**130.7 lb**	**3.6 lb**	**0.8 lb**	**39.6 ind**	**± 68%**
Whitefishes										
Sheefish	90.0%	73.3%	73.3%	53.3%	43.3%	11,833.0 lb	328.7 lb	72.0 lb	1,062.2 ind	± 47%
Broad whitefish	23.3%	13.3%	13.3%	13.3%	6.7%	913.9 lb	25.4 lb	5.6 lb	285.6 ind	± 58%
Bering cisco	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Least cisco	6.7%	3.3%	0.0%	6.7%	3.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Humpback whitefish	30.0%	20.0%	20.0%	16.7%	6.7%	330.1 lb	9.2 lb	2.0 lb	157.2 ind	± 50%
Round whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown whitefishes	3.3%	0.0%	0.0%	3.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**93.3%**	**80.0%**	**80.0%**	**70.0%**	**46.7%**	**13,077.0 lb**	**363.3 lb**	**79.5 lb**	**1,505.0 ind**	**± 36%**
Anadromous/marine fish										
Pacific herring	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Smelt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Saffron cod	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0**	**± 0%**
Other freshwater fish										
Burbot	10.0%	10.0%	10.0%	6.7%	3.3%	95.8 lb	2.7 lb	0.6 lb	22.8 ind	± 51%
Arctic grayling	33.3%	30.0%	30.0%	13.3%	16.7%	230.7 lb	6.4 lb	1.4 lb	256.3 ind	± 42%
Northern pike	30.0%	30.0%	30.0%	10.0%	16.7%	315.8 lb	8.8 lb	1.9 lb	95.7 ind	± 34%
Subtotal	**43.3%**	**40.0%**	**40.0%**	**20.0%**	**26.7%**	**642.3 lb**	**17.8 lb**	**3.9 lb**	**374.9 ind**	**32%**
All fish	**100.0%**	**83.3%**	**83.3%**	**86.7%**	**70.0%**	**28,992.1 lb**	**805.3 lb**	**176.4 lb**		**± 31%**
All resources	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**90.0%**	**50,742.6 lb**	**1,409.5 lb**	**308.7 lb**		**± 24%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

Nearly a third of the community households used other species of fish as well. Approximately 256 Arctic grayling (231 lb) were harvested by 30% of the households. Ninety-six northern pike (316 lb) were harvested by 30% of the households using gillnets as well as rod and reel. Of those fish, 67 were used for dog food (Table D4-6). Dolly Varden were used less; they were harvested by 13% of the households but used by 17%. Finally, 23 burbot (96 lb) were harvested and used by 10% of Kobuk households.

Fishing Gear and Harvest Locations

With the exception of 89 lb of chum salmon, all salmon were caught with subsistence gillnets (Figure 4-8). Residents anchor set gillnets to the bank in July in order to detect when salmon begin to arrive near Kobuk. Set gillnets are a popular means of harvesting salmon because the nets continue to fish while the fisher is occupied with other activities. However, set gillnet sites are limited, and many fishers use eddies located at a distance from town. Fishers check their nets at least once day, and traveling a long distance each day requires a substantial investment of time and fuel. One respondent reported that he and others share a net; they alternate checking it in order to reduce the travel effort and distribute salmon between the households.

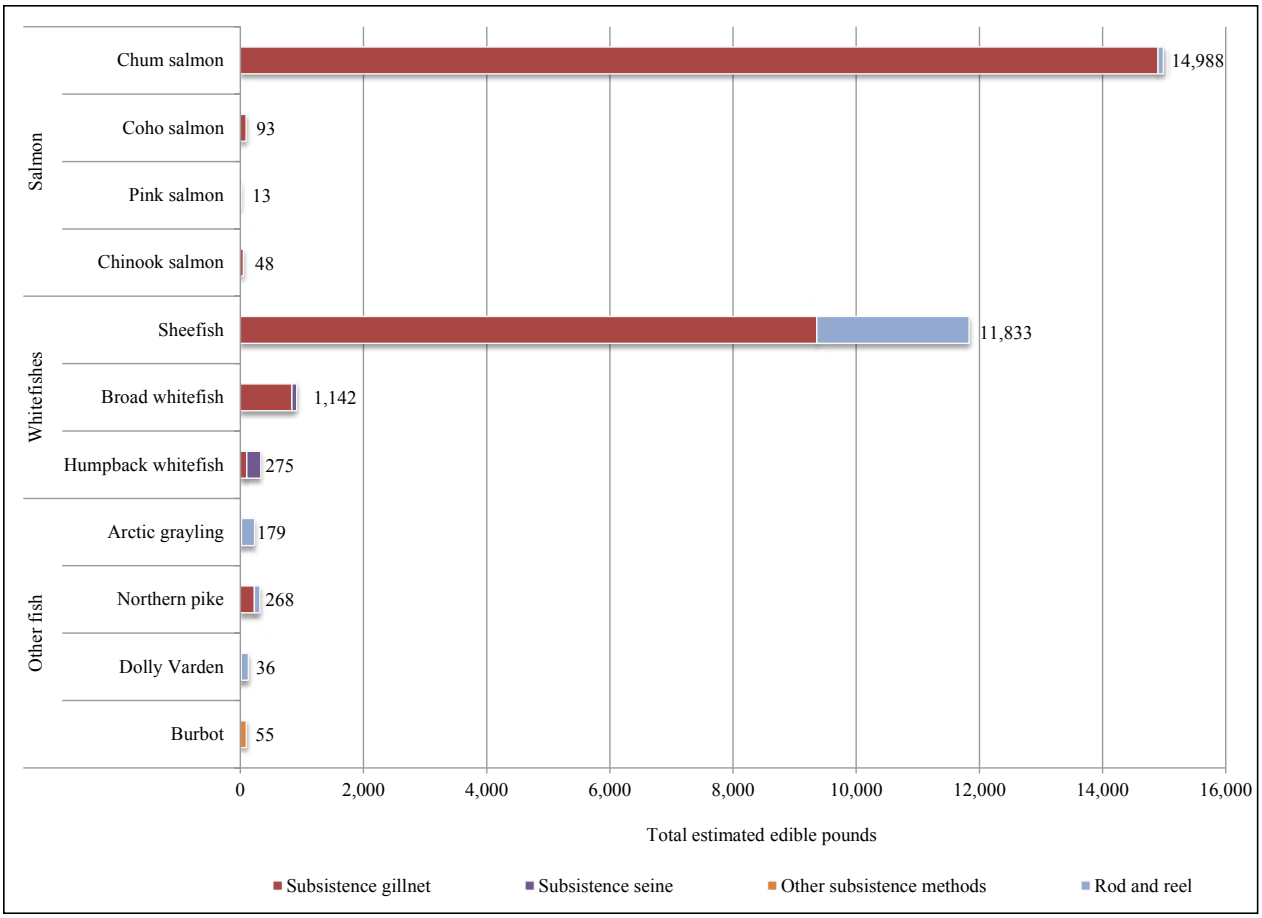

Figure 4-8.–Salmon and nonsalmon fish harvest by gear type, Kobuk, 2012.

However, respondents indicated that in past years seining (*qaaktuq*) was the most common method to harvest salmon.

> And the other thing I notice since I was younger … we seined every … you know for salmon, for … for whitefish, every year, I mean … my aunt does this still today, but when I was younger we, I mean my mum would seine many times over the summer, you know, when the weather cool off a little, maybe in July, August. And then, um, the only type of transportation is, were dog, was the dog team so they had to, you know, bring more food in for the dogs. (OBU01020913)

The increased use of snowmachines reduced the need for seining to target salmon. Dog teams required year-round food, provided mainly by salmon. One respondent reported that they could easily catch up to 80 salmon per set, though it was a lot of work (OBU04020813). The process is described below:

> Seine, that is only fall time. We're actually trained to do that from an elder from Shungnak, we, instead of doing it in an eddy like we do the whitefish, we go to a bank where it is swift and then we just, uh, get our boat ready way up here, and here's the sandbar, and we just watch down here and move to see a ripple, ripples from fish coming, we see them and then we just wait for them. When they are getting close, we go out and go. You set about just doing this, the anchor man, because the boat is supposed to be floating, the anchorman has got to walk all the way out to the bank and try to get the whole, the whole bank. (OBU04020813)

Salmon search and harvest sites were primarily located near the community of Kobuk along the Kobuk River (Figure 4-9). However, as discussed above, the limited number of suitable set gillnet sites near the

community prompts some users to harvest salmon farther from the community. Additional sites were located upstream of the community between the Kogoluktuk and Mauneluk rivers and at the mouth of the Pah River.

After breakup, sheefish migrate en masse from their coastal wintering areas to spawning areas in the upper Kobuk River, upstream of the Pah River. This migration takes months, and sheefish generally reach Kobuk in July. At this point they can be caught along with chum salmon in subsistence set gillnets. Just prior to spawning, the fish are fat, the eggs are ripe, and the temperature is cold enough to age the harvest (Georgette and Loon 1990:12). However, sheefish are not specifically targeted until the fall when they begin spawning. Afterward, they begin their migration back down the Kobuk River. This outmigration is brief, and fishers have to be timely in order to intercept the fish.

> When they come up in June and July, people usually hook [rod and reel] for them; sometimes you'll catch an occasional one in the net, but I guess they are just not hanging out in the eddies, they are coming upriver. And then once they are up here, upriver from here about 15 miles then they hang around and spawn for a while, and then they rush downriver, and then if you have your net out in the eddies you'll catch some. (OBU03021013)

Fishers used subsistence gillnets to harvest 6,737 lb of sheefish (Figure 4-8). Because sheefish on the upper Kobuk River are so much larger in size than other available fish species, some respondents reported using large mesh nets to target sheefish. Others said that owning 2 sizes of gillnets is not feasible due to the price, so they target sheefish in the fall with their chum salmon gear.

Kobuk fishers harvested an additional 2,475 lb of sheefish using hook and line gear, as described in the quote above. Fishers use this method partly as recreation, and also as a means to limit their harvest. Rod and reel are used in the summer, and generally when the water is clear. However, due to the abnormally wet summer months in 2012, the high river water was not very clear. This resulted in very poor rod and reel fishing for much of the season (OBU04020813).

Lastly, seining is a popular method for targeting sheefish; however, no such harvest was documented during the study due to high water conditions. This method is usually employed in late September in spawning areas (Georgette and Loon 1990). Fishers travel upriver to spawning areas in the fall to increase their harvest. Additionally, the cool weather allows fishers to leave the sheefish in the open air to age, and then freeze, which makes the delicacy called "stink fish." "Then for the stink fish they go way upriver and they get them by the net by the hundreds. … yeah, we actually go to Pah River yeah" (OBU04020813). Another respondent further elaborated on the different methods used to preserve sheefish:

> Um … how we process that is we, sometimes we will freeze the bellies, or … you know, freeze parts of the fish. A lot of the elderly people like to eat the heads, boil the heads and eat the heads. And … another thing that we do is we put it in … early in the fall we put it … you know, we pile them together in a hole or something with grass. (OBU01020913)

Whitefishes are targeted throughout the open water season. Setnets are set as soon as the ice goes out. "In May. They—that's when, after the water settle, it's not muddy anymore—they start putting nets out for whitefish" (OBU05021013). Broad whitefish (*qausriluk*) move out of tundra lakes into the river during this time, followed by humpback whitefish (*qaalgiq*). Residents have reported that the broad whitefish that wintered in tundra lakes were fatter than those from the coast, and they had a better flavor (Georgette and Shiedt 2005). Fishers target them with short set gillnets placed in small creeks and sloughs near the Kobuk River. This method accounted for the majority of broad whitefish harvested (837 lb), and a few humpback whitefish (103 lb) (Figure 4-9). Residents have used whitefishes for immediate consumption rather than preserving them for future use (Georgette and Shiedt 2005).

Although whitefish seining begins in midsummer, it occurs most frequently in the fall. After the heat of summer has ebbed, large quantities of fish can be processed with minimum spoilage. Groups of up to 4 community members, generally women, gather at the riverbank to target both broad and humpback whitefish migrating up the Kobuk River. Respondents described the composition of seining crews as flexible, allowing

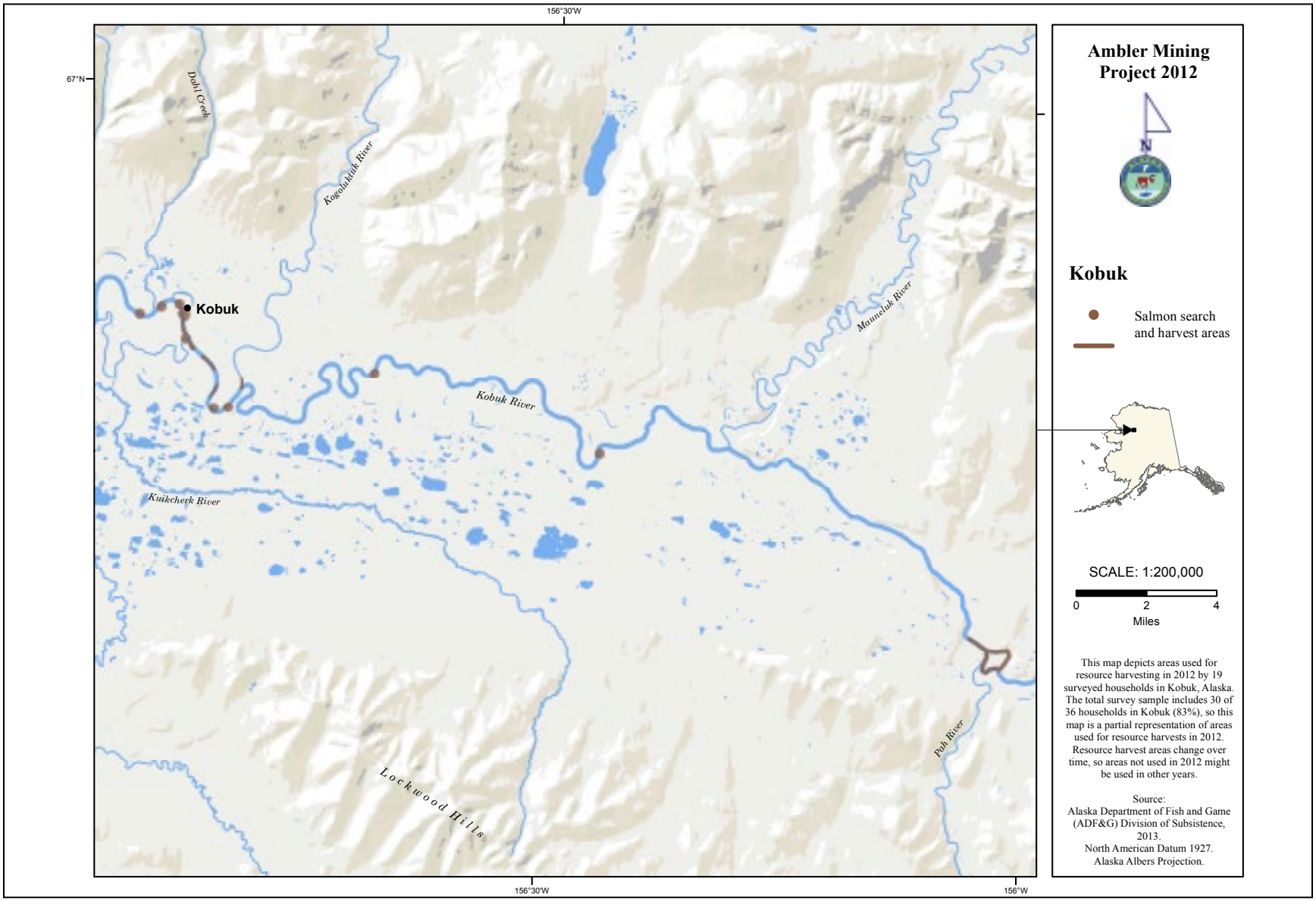

Figure 4-9.–Salmon search and harvest areas, Kobuk, 2012.

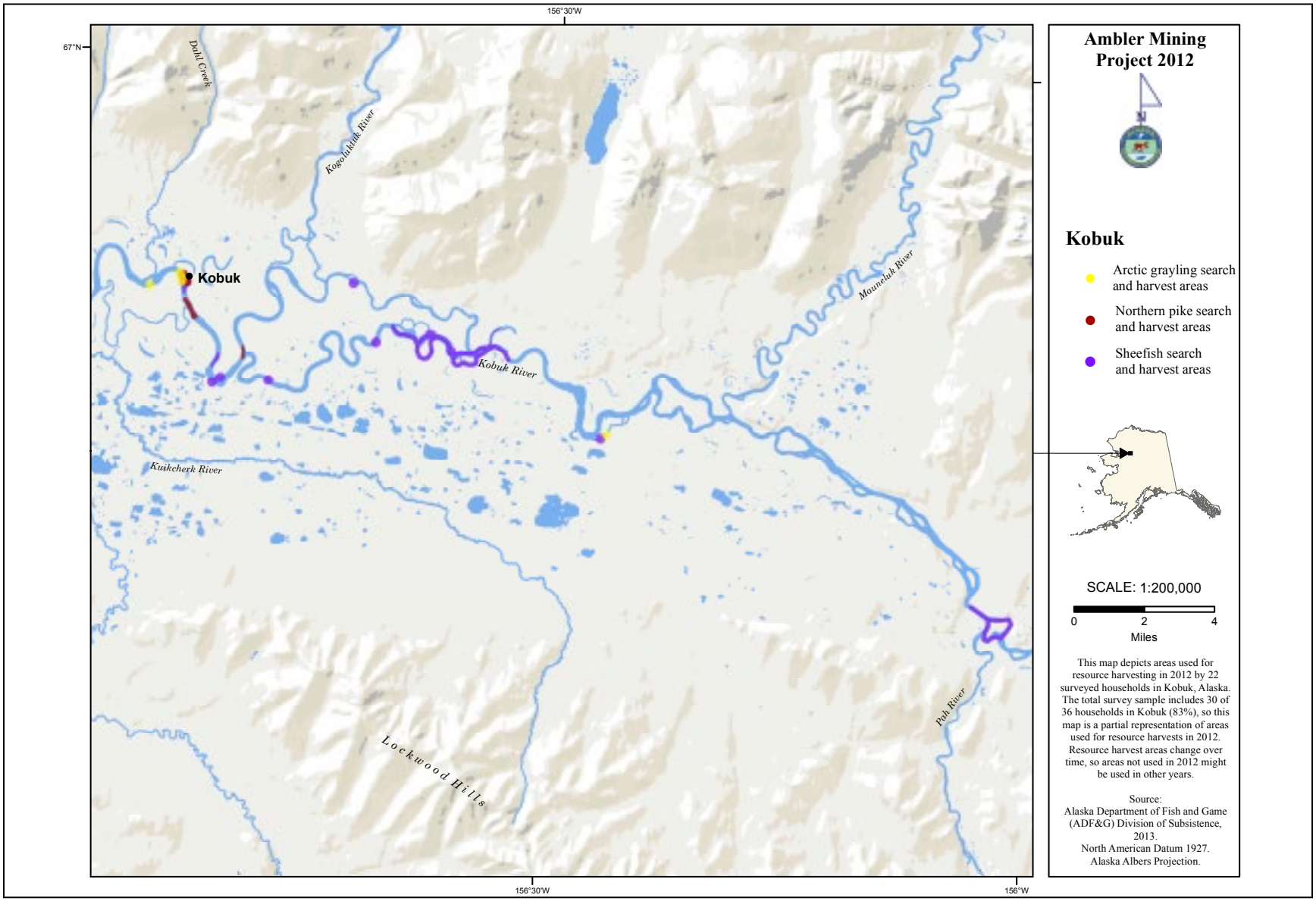

Figure 4-10.–Arctic grayling, northern pike, and sheefish search and harvest areas, Kobuk, 2012.

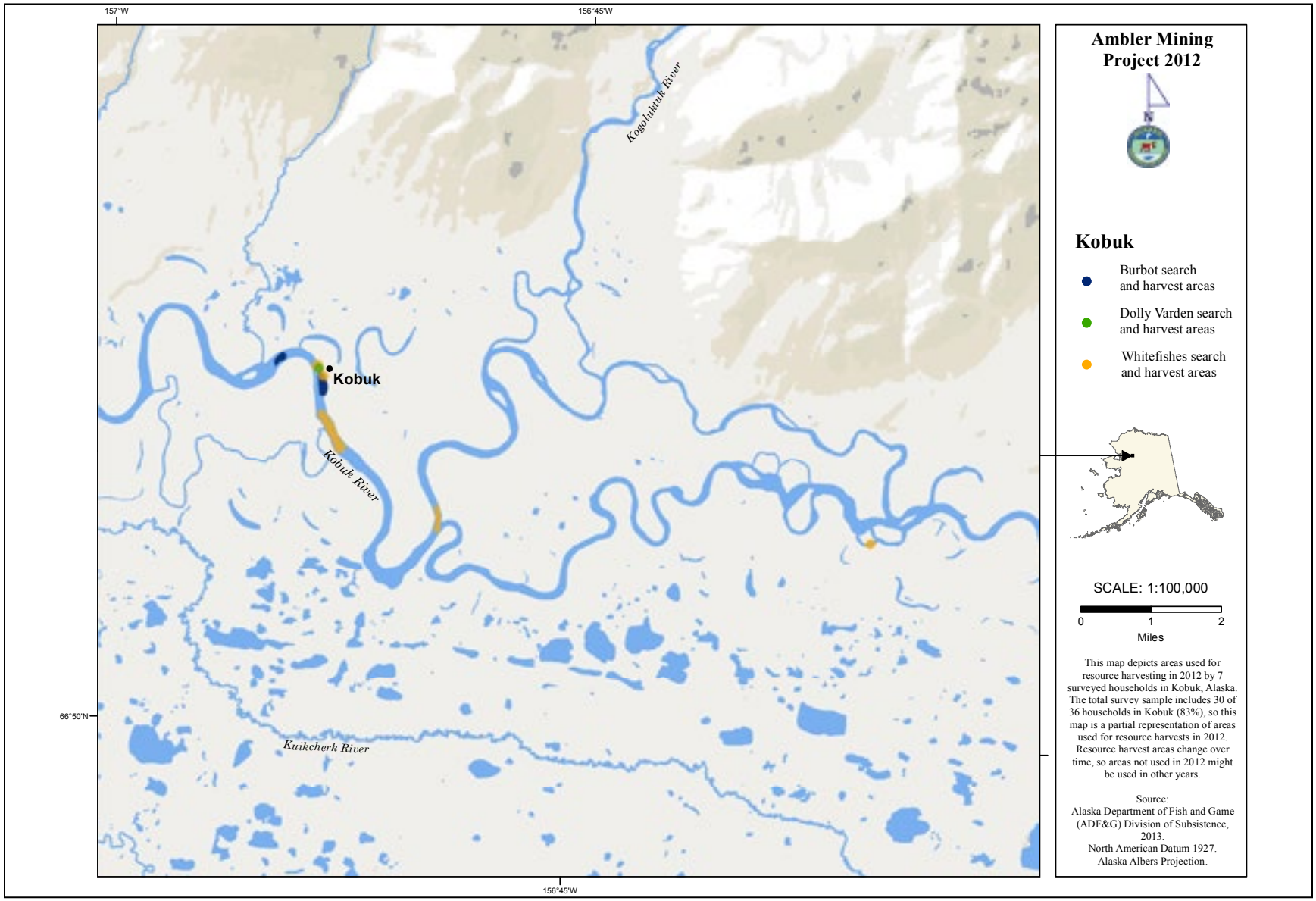

Figure 4-11.–Burbot, Dolly Varden, and whitefishes search and harvest areas, Kobuk, 2012.

many different community members to participate for a share of the whitefishes. Seining for whitefishes occurs in the late morning or early afternoon when the fish are at rest (Anderson et al. 1977:229). Fishing groups deploy the seine in an eddy in much the same manner that they deploy it in the river current for salmon.

Fishers targeted nonsalmon fish species in many of the same locations as salmon. No fishers reported going downstream in search of fish; most looked upstream of the community. Sheefish were targeted along the mainstem of the Kobuk River beginning at a specific location that respondents referred to as "cut-bank" and continuing to the Pah River (Figure 4-10). Fishing for sheefish occurred most intensively where the Kobuk River intersects the "old channel" on its upstream side. The farthest upstream fishers traveled for sheefish was to the confluence of the Pah River and Kobuk River. This range is smaller compared to other years, 1 respondent pointed out, because fishers often go beyond the Pah River to harvest sheefish. Other whitefish species were targeted along the mainstem of the Kobuk River, near the community, and at the river's confluence with the "old channel."

Respondents reported their harvest locations for other nonsalmon fish species such as Arctic grayling, burbot, Dolly Varden, and northern pike (Figure 4-10; Figure 4-11). Most of these species were harvested from a short section of the river close to the community. One respondent reported fishing for Arctic grayling downriver of the Mauneluk River mouth in the same slough used to target sheefish.

Large Land Mammals

Caribou constituted the bulk of Kobuk hunters' land mammal harvest. Kobuk hunters harvested an estimated 119 caribou, totaling 16,173 lb (Table 4-4; Plate 4-3). Fifty-seven percent of the households harvested caribou, and the harvests were distributed widely throughout the community. Almost every household (93%) used caribou during the study year. The harvests occurred during 2 periods of the year: early fall and midwinter (Table D4-7). Most of the caribou harvest (73%) was composed of bulls, primarily selected during August and September when they are fat before the rut.

During the open water period of summer, hunters anticipate caribou crossing areas during their fall migration. Kobuk hunters embark on multi-day trips to those locations. Many hunters still intercept caribou at water crossings. "And you know she would drive the boat and I just had a .22 rifle and you just get real close when you're in the boat and able to shoot 'em right in the ear. I guess I like using a small rifle. I like getting them close and feel like you don't ruin a whole bunch of anything" (OBU03021013). During this time of the year, hunters generally target larger bulls that arrive ahead of the females. Caribou harvested during the fall are carefully processed and frozen fresh.

Caribou are less predictably located during the winter months, and consequently less available to Kobuk hunters. Cold temperatures and diminished daylight limit the distances hunters can travel in the winter. The likelihood of groups of caribou wintering within a reasonable distance to the community changes from year to year. When caribou herds are located, this information is transmitted freely between communities and households by word of mouth. Hunters must then weigh their need for meat with the distance they must travel. Thirty-four caribou were harvested during the mid-winter months of December and January, a time of year when subsistence food gathering activities have waned (Table D4-7). Hunters target cows during the winter because they are fatter than bulls (OBU02021013). However, the 2012 data show that half of the winter harvest was composed of bulls. Respondents reported harvesting 10 caribou of unknown sex. Caribou harvested during the winter can be aged completely without removing the skin or viscera and one respondent described using this method for softening and sweetening the meat. Then in the spring, the caribou is thawed. Community members cut it into strips to make dry meat, or they package and freeze it.

Only 2 black bears (211 lb) were harvested during the study year. Both were harvested during August (Table D4-7). Respondents discussed bears less than other large game species. Both black and brown bears were hunted during the study year, and respondents reported that both are commonly consumed. However, only 17% of households used black bears, and none reported using brown bears.

Table 4-4.–Estimated harvest and use of land and marine mammals, Kobuk, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Land mammals										
Large land mammals										
Black bear	16.7%	13.3%	6.7%	10.0%	6.7%	211.2 lb	5.9 lb	1.3 lb	2.4 ind	± 58%
Brown bear	0.0%	3.3%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Caribou	93.3%	66.7%	56.7%	73.3%	58.6%	16,173.3 lb	449.3 lb	98.4 lb	118.9 ind	± 17%
Moose	50.0%	30.0%	10.0%	43.3%	13.8%	1,936.8 lb	53.8 lb	11.8 lb	3.6 ind	± 47%
Common muskox	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Dall sheep	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**96.7%**	**73.3%**	**60.0%**	**80.0%**	**60.0%**	**18,321.3 lb**	**508.9 lb**	**111.4 lb**	**124.9 ind**	**± 16%**
Small land mammals										
Beaver	26.7%	23.3%	20.0%	10.0%	16.7%	624.0 lb	17.9 lb	3.8 lb	55.9 ind	± 50%
Arctic fox	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Red fox	16.7%	13.3%	13.3%	10.3%	6.7%	*Not usually eaten.*			13.2 ind	± 46%
Alaska hare	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Snowshoe hare	6.7%	6.7%	6.7%	3.3%	6.7%	24.0 lb	0.7 lb	0.1 lb	9.6 ind	± 60%
North American river (land) otter	3.3%	3.3%	3.3%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	1.2 ind	± 83%
Lynx	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Marmot	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Marten	13.3%	10.0%	10.0%	3.3%	3.3%	*Not usually eaten.*			16.8 ind	± 61%
Mink	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Muskrat	13.3%	10.0%	10.0%	6.7%	13.3%	15.1 lb	0.4 lb	0.1 lb	8.4 ind	± 53%
Porcupine	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Arctic ground (parka) squirrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Gray wolf	20.0%	16.7%	16.7%	3.3%	6.7%	*Not usually eaten.*			18.0 ind	± 42%
Wolverine	0.0%	0.0%	0.0%	0.0%	0.0%	*Not usually eaten.*			0.0 ind	± 0%
Subtotal	**40.0%**	**40.0%**	**36.7%**	**16.7%**	**26.7%**	**663.1 lb**	**18.4 lb**	**4.0 lb**	**123.1 ind**	**± 35%**
Marine mammals										
Bearded seal	10.0%	0.0%	0.0%	10.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Ringed seal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Spotted seal	3.3%	0.0%	0.0%	3.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown seal	60.0%	0.0%	0.0%	60.0%	16.7%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Beluga whale	16.7%	0.0%	0.0%	16.7%	6.7%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Bowhead whale	33.3%	0.0%	0.0%	33.3%	13.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**63.3%**	**0.0%**	**0.0%**	**63.3%**	**23.3%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0%**
All land mammals	**96.7%**	**76.7%**	**66.7%**	**80.0%**	**63.3%**	**18,984.4 lb**	**527.3 lb**	**115.5 lb**	**248.0 ind**	**± 21%**
All marine mammals	**63.3%**	**0.0%**	**0.0%**	**63.3%**	**23.3%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0%**
All resources	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**90.0%**	**50,742.6 lb**	**1,409.5 lb**	**308.7 lb**		**± 24%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

Finally, 4 bull moose were harvested in September and provided 1,937 lb of meat (Table D4-7; Table 4-4). Though only 10% of the households reported harvesting moose, one-half (50%) of the community households used the resource. Most households indicated that they received moose from another household. Moose are a relatively recent arrival to the upper Kobuk River and occur there only in low densities (Westing 2010:551). Respondents' observations support this scarcity. Moose are not pursued as actively as caribou; only 30% of the households reported hunting moose (Table 4-4).

Small Land Mammals/Furbearers

Kobuk hunters harvest small land mammals for food and fur, or sometimes both. During the study period, 56 beavers were harvested by 20% of the households, providing 624 lb of meat (Table 4-4). Beaver was the most widely used small land mammal resource (27% of households). The harvest occurred primarily during the open water month of May, with a smaller amount harvested in April and October (Table D4-8). Muskrats were harvested during the same spring months as beavers, though only 8 were harvested in 2012. One respondent corroborates these low harvest estimates: "But they do hunt the beaver. I think the young people don't eat as much beaver … I mean I know I don't. I don't eat beaver or muskrat. I did when I was young, because my parents you know, they cooked it all the time. Not all the time but… as much as they


ADFG

Plate 4-3.–Kobuk resident scraping a caribou hide.

did… just at certain time of the year" (OBU01020913).

Snowshoe hares were harvested in minimal quantities. Kobuk households harvested 10 hares during the study year, mostly in March (Table 4-4; Table D4-8). Respondents shared their observations on the scarcity of hares, referred to locally as "rabbits." One respondent that uses hares for food and skin sewing said, "For some reason there are hardly any rabbits around here and that is kind of concerning for me, too. We used to have lots of rabbits around here on a cycle but we haven't seen any rabbits for 20 years" (OBU03021013).

Gray wolves represent the second largest land mammal harvest by number of individuals (Table 4-4). Seventeen percent of households harvested a total of 18 wolves during the study year. Households targeted wolves steadily between November and February, when they can be pursued by snowmachine (Table D4-8).

Most other furbearing animals were trapped during the winter months when their fur is in prime condition and they can be effectively trapped. An estimated total of 13 red foxes, 17 martens, and 1 river otter were trapped from October to April (Table D4-8). The respondents that discussed harvesting or receiving fur said that it was generally used by community members for sewing garments for both personal use and exchange.

Land Mammal Hunting and Harvest Locations

Hunters searched extensively for large land mammals (Figure 4-12), primarily focusing their efforts downriver of the community. The area north of Kobuk has been the focus of conflict between local and nonlocal hunters, and some key respondents indicated that they hunt elsewhere as a way to avoid interactions with nonlocal hunters. This will be discussed further in the Local Comments and Concerns section below.

Kobuk hunters covered the most land in search of caribou. Caribou were hunted along the Kobuk River from the community to Onion Portage, a historical, well-known river crossing. Hunters likely traveled downriver with that destination in mind, hunting along the way. Additional caribou hunting areas were located north of Kobuk, where hunters could take advantage of a small road system connecting the community to a mineral exploration site near the Ambler River. Lastly, hunters used tundra adjacent to the Kuikcherk River, likely for hunting caribou in the winter. Lands used for moose hunting mirror those used for caribou hunting. Hunters may have searched for both large land mammals during the same outing. Respondents hunted black bears north of the community along the road system that snakes through the Cosmos Hills to Bornite mine. Lastly, community members hunted brown bears in a small area along the bank of the Kobuk River, upstream from the community.

Furbearers search and harvest areas are depicted in Figure 4-13. The map reflects areas that hunters used in search of all small land mammals. Hunters and trappers searched for beavers and muskrats along the river corridor as well as in adjoining sloughs and lakes. Foxes and marten search areas were closer to town. Lastly, hunters used the road system to access the Cosmos Hills and Ambler River basin north of Kotzebue to trap.

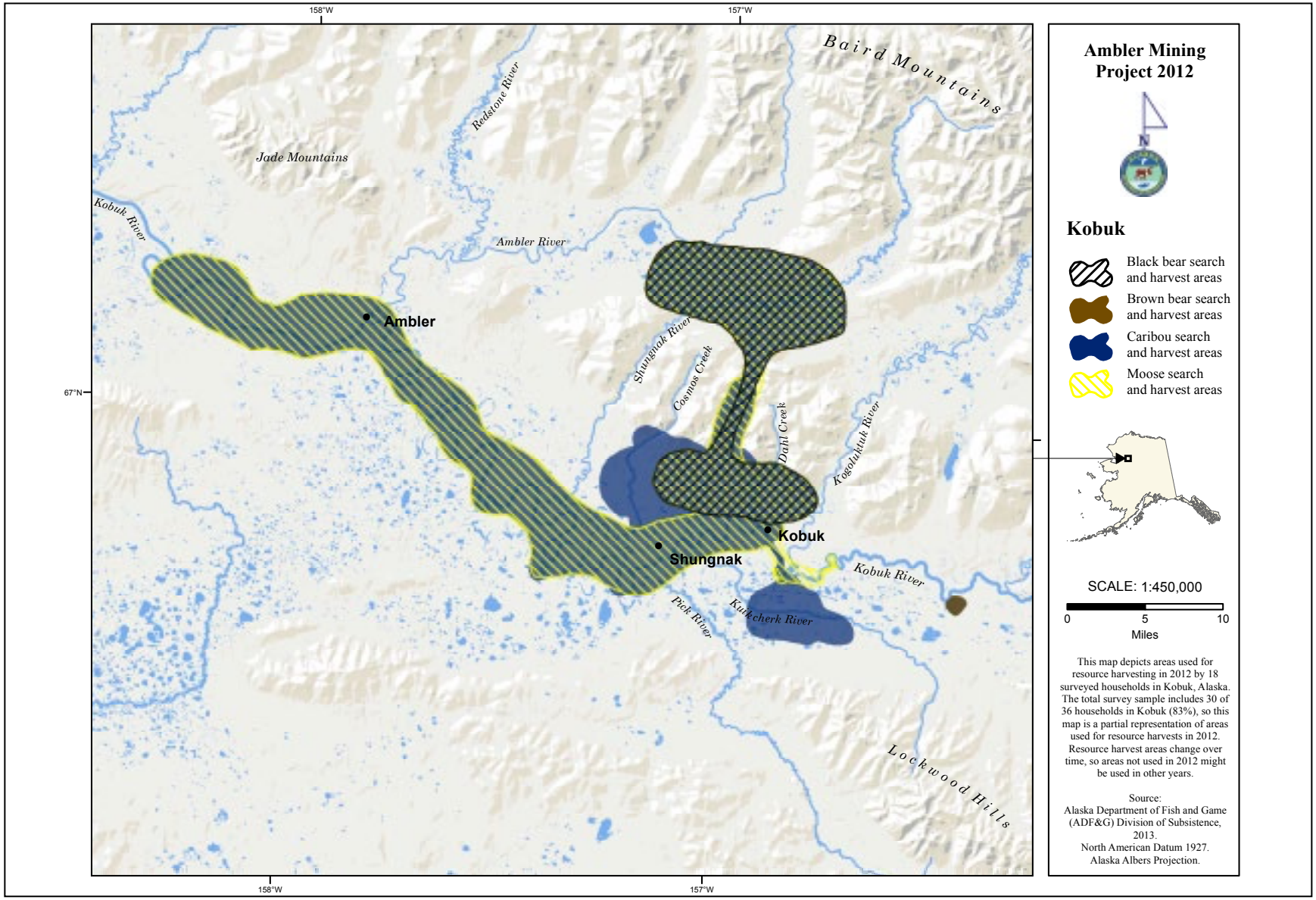

Figure 4-12.–Black bear, brown bear, caribou, and moose search and harvest areas, Kobuk, 2012.

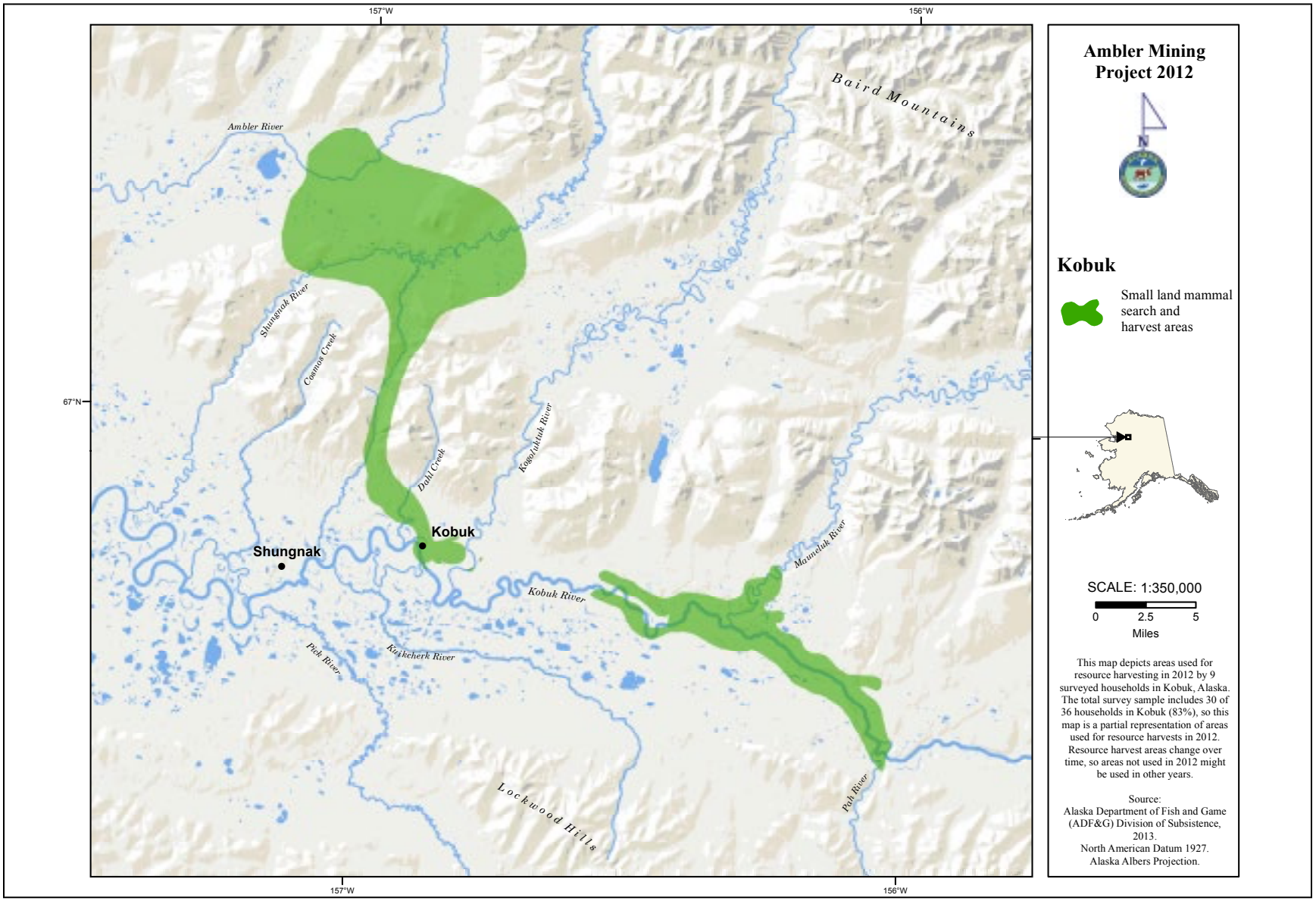

Figure 4-13.–Small land mammal search and harvest areas, Kobuk, 2012.

Table 4-5.–Estimated harvest and use of marine invertebrates, Kobuk, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Marine invertebrates										
Unknown clams	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
King crab	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Mussels	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Shrimp	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Unknown marine invertebrates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Subtotal	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0**	**± 0%**
All marine invertebrates	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0**	**± 0%**
All resources	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**90.0%**	**50,742.6 lb**	**1,409.5 lb**	**308.7 lb**		**± 24%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

Marine Mammals

Although no households reported attempting to harvest marine mammals, these resources were widely used by Kobuk households (Table 4-4; Table D4-9). Sixty-three percent of Kobuk households reported using marine mammals. Unknown seal, likely meaning seal oil, was used by 60% of the households and was often given away. Residents use seal oil to moisten lean fish when baking it in an oven. They also use seal oil as a dipping condiment for dry meat and *quaq*, frozen fish. The high level of marine mammal use and apparent lack of harvest suggests that all of it was harvested in other communities. This indicates strong trade relations between Kobuk and coastal areas.

Marine Invertebrates

No marine invertebrates were harvested or used in Kobuk during the study year (Table 4-5).

Birds and Eggs

Migratory birds made up the overwhelming majority of bird harvests: 78% of the total harvest by number of individuals harvested (Table 4-6). White-fronted geese (483 lb, 114 individuals) and Canada geese (383 lb, 112 individuals) were the 2 most harvested species overall. Yet, despite having near equal harvest values and household participation in the hunt, Canada geese were used by twice as many households than those that used white-fronted geese. Mallards, northern pintails, and long-tailed ducks were the most harvested duck species, totaling 169 individuals (285 lb). One-half (50%) of community households used mallards. Large birds, such as tundra swans and sandhill cranes, contributed a small proportion to the overall harvest. The entire migratory bird harvest occurred during the spring months, when hunters are motivated by long spring days and the possibility of fresh meat (Table D4-10).

Non-migratory birds, notably grouse and ptarmigan, are often harvested around Kobuk. Residents harvested an estimated 120 ptarmigan and 50 grouse. Ptarmigan were harvested during the spring, fall, and winter seasons (Table D4-10). Ptarmigan were more widely distributed, having been used by 60% of Kobuk households. Grouse, on the other hand, were only harvested during the fall.

Hunters searched for upland game birds, such as grouse and ptarmigan, in the hills and tundra immediately north of the community (Figure 4-14). They also searched for them upstream of the community and in a small area across the Kobuk River from the community. Hunters covered a more expansive area, mostly including wetlands and rivers, in search of migratory birds. Residents hunted around the tundra lakes, south of town, between the Kuikcherk and Kobuk rivers. They also hunted along the Kogoluktuk River and Kobuk River.

No households reported harvesting or using bird eggs during the study period (Table 4-7).

Table 4-6.–Estimated harvest and use of birds, Kobuk, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Migratory birds										
Ducks										
Bufflehead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Canvasback	3.3%	3.3%	3.3%	0.0%	3.3%	7.2 lb	0.2 lb	0.0 lb	3.6 ind	± 83%
Common eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown eider	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Goldeneye	3.3%	0.0%	0.0%	3.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Harlequin duck	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Mallard	50.0%	33.3%	33.3%	20.0%	26.7%	150.8 lb	4.2 lb	0.9 lb	77.3 ind	± 34%
Long-tailed duck	26.7%	20.0%	20.0%	6.7%	16.7%	55.4 lb	1.5 lb	0.3 lb	41.3 ind	± 54%
Northern pintail	30.0%	10.0%	10.0%	23.3%	13.3%	78.6 lb	2.2 lb	0.5 lb	50.4 ind	± 62%
Scaup	16.7%	13.3%	13.3%	3.3%	13.3%	45.9 lb	1.3 lb	0.3 lb	27.3 ind	± 58%
Black scoter	10.0%	3.3%	3.3%	6.7%	3.3%	21.1 lb	0.6 lb	0.1 lb	12.0 ind	± 83%
Surf scoter	3.3%	0.0%	0.0%	3.3%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
White-winged scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Northern shoveler	13.3%	6.7%	6.7%	6.7%	6.7%	14.4 lb	0.4 lb	0.1 lb	13.2 ind	± 58%
Green-winged teal	6.7%	0.0%	0.0%	6.7%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Wigeon	16.7%	10.0%	10.0%	10.0%	10.0%	40.9 lb	1.1 lb	0.2 lb	31.2 ind	± 57%
Unknown ducks	6.7%	6.7%	6.7%	0.0%	6.7%	99.0 lb	2.8 lb	0.6 lb	66.0 ind	± 58%
Subtotal	**63.3%**	**33.3%**	**33.3%**	**33.3%**	**33.3%**	**513.3 lb**	**14.3 lb**	**3.1 lb**	**322.4 ind**	**± 38%**
Geese										
Brant	6.7%	6.7%	6.7%	0.0%	6.7%	11.3 lb	0.3 lb	0.1 lb	5.0 ind	± 82%
Canada/cackling goose	63.3%	36.7%	36.7%	50.0%	30.0%	382.6 lb	10.6 lb	2.3 lb	111.9 ind	± 37%
Emperor goose	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Snow goose	10.0%	6.7%	0.0%	3.3%	3.3%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
White-fronted goose	33.3%	30.0%	30.0%	20.0%	23.3%	483.4 lb	13.4 lb	2.9 lb	114.0 ind	± 35%
Unknown geese	3.3%	3.3%	3.3%	0.0%	3.3%	204.4 lb	5.7 lb	1.2 lb	61.2 ind	± 83%
Subtotal	**100.0%**	**86.7%**	**86.7%**	**80.0%**	**66.7%**	**1,081.6 lb**	**30.0 lb**	**6.6 lb**	**292.0 ind**	**± 30%**
Other migratory birds										
Tundra (whistling) swan	3.3%	3.3%	3.3%	0.0%	0.0%	13.5 lb	0.4 lb	0.1 lb	1.2 ind	± 83%
Sandhill crane	6.7%	6.7%	6.7%	0.0%	0.0%	16.2 lb	0.5 lb	0.1 lb	2.4 ind	± 58%
Unknown shorebirds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown loon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown seabirds	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**6.7%**	**6.7%**	**6.7%**	**0.0%**	**0.0%**	**29.7 lb**	**0.8 lb**	**0.2 lb**	**3.6 ind**	**± 61%**
Other birds										
Grouse	30.0%	30.0%	30.0%	16.7%	23.3%	35.1 lb	1.0 lb	0.2 lb	50.1 ind	± 31%
Ptarmigan	60.0%	46.7%	46.7%	30.0%	33.3%	120.0 lb	3.3 lb	0.7 lb	120.0 ind	± 26%
Subtotal	**63.3%**	**50.0%**	**50.0%**	**33.3%**	**36.7%**	**155.1 lb**	**4.3 lb**	**0.9 lb**	**170.1 ind**	**± 24%**
All migratory birds	**73.3%**	**40.0%**	**40.0%**	**56.7%**	**40.0%**	**1,624.6 lb**	**45.1 lb**	**9.9 lb**	**618.0 ind**	**± 33%**
All other birds	**63.3%**	**50.0%**	**50.0%**	**33.3%**	**36.7%**	**155.1 lb**	**4.3 lb**	**0.9 lb**	**170.1 ind**	**± 24%**
All resources	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**90.0%**	**50,742.6 lb**	**1,409.5 lb**	**308.7 lb**		**± 24%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

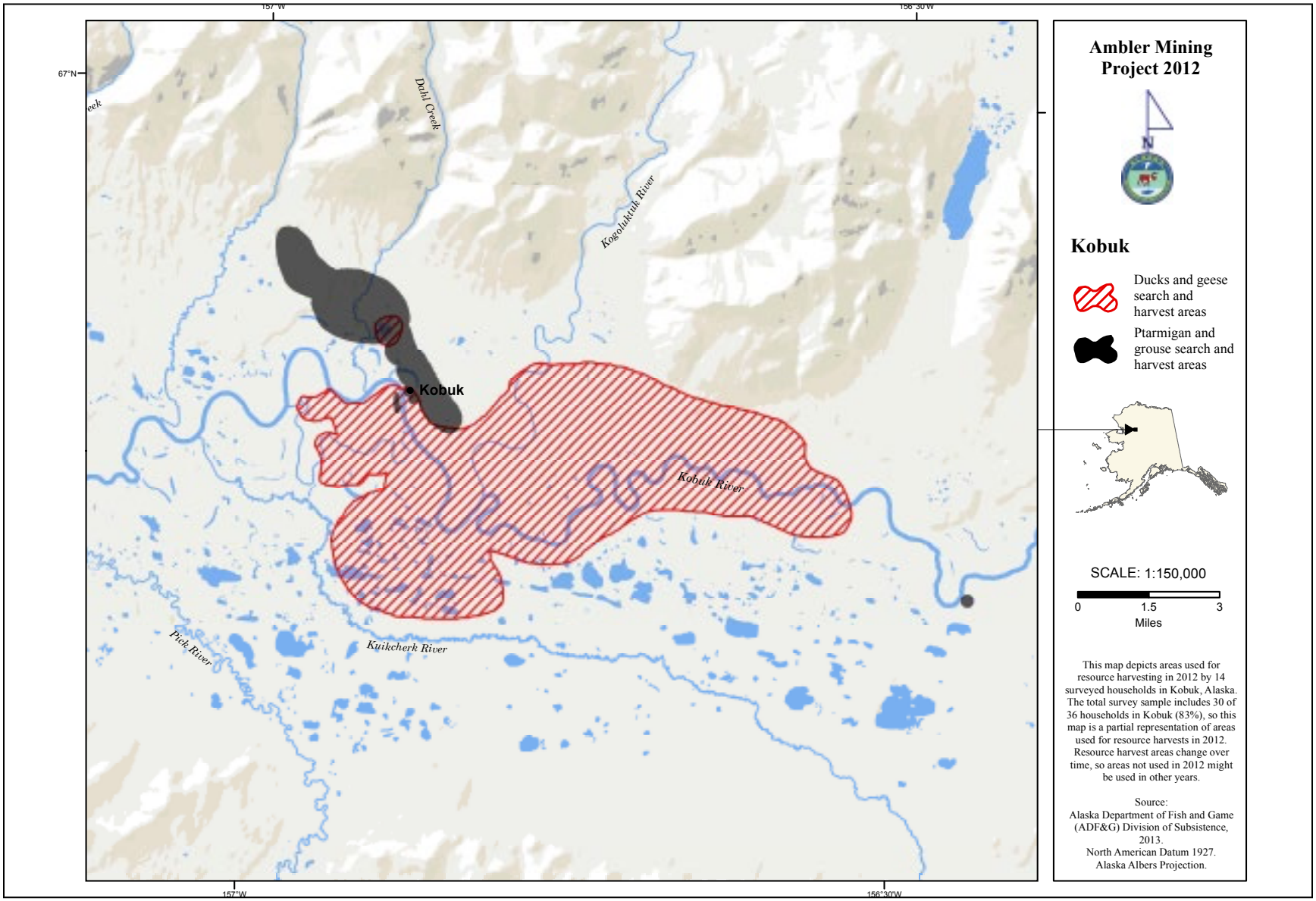

Figure 4-14.–Ducks, geese, ptarmigan, and grouse search and harvest areas, Kobuk, 2012.

Table 4-7.–Estimated harvest and use of bird eggs, Kobuk, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Bird eggs										
Duck eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Goose eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Swan eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Shorebird eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Gull eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Unknown eggs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 ind	± 0%
Subtotal	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0 lb**	**0.0 lb**	**0.0 lb**	**0.0 ind**	**± 0%**
All birds and eggs	**90.0%**	**56.7%**	**56.7%**	**66.7%**	**50.0%**	**1,779.7 lb**	**49.4 lb**	**10.8 lb**	**788.1 ind**	**± 37%**
All resources	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**90.0%**	**50,742.6 lb**	**1,409.5 lb**	**308.7 lb**		**± 24%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

Vegetation

The use of vegetation by Kobuk residents is ubiquitous. Eighty-seven percent of Kobuk households harvested vegetation and 80% received it (Table 4-8). Chief within this category were blueberries. Kobuk households harvested an estimated total of 96 gallons of blueberries. They were harvested by 67% of the community but used by 87% of Kobuk households. Households harvested lowbush cranberries (89 gallons) and salmonberries (32 gallons) in lesser quantities. Very few highbush cranberries or crowberries were used.

The abundance of berries varies noticeably from year to year and is dependent on climate and weather. On respondent said that the past few years prior to the study period had been drier and produced fewer berries (OBU01020913).

> Sometimes when we don't get much …. Seems like when it snow lots there's more berries. If we don't get much snow, we don't, very much … and it'll be different areas sometimes that grow. Up on the mountains or, in the valley. We just have to look when they start growing. (OBU05021013)

Plants, greens, and mushrooms were less sought after than berries. Only 3% of Kobuk households reported harvesting and using wild rhubarb, the most heavily harvested non-berry plant by edible weight. They harvested 12 gallons amounting to an estimated 48 lb. A few households also harvested Eskimo potato (*masru*), stinkweed (*sargiq*), and Hudson's Bay (Labrador) tea.

Respondents were asked whether or not they used, harvested, or shared wood. Eighty percent of Kobuk households used wood, though one-half (50%) of the households gathered it. Most of the wood was used as firewood, but respondents also reported gathering wood for smoking and for arts and crafts. One respondent reported gathering roots for crafts.

Plants were gathered mostly in the tundra and hills north of the community (Figure 4-15). Residents also gathered vegetation along the river, south of the community, and in isolated locations to the east.

Table 4-8.–Estimated harvest and use of vegetation, Kobuk, 2012.

	Percentage of households					Estimated pounds harvested			Total estimated amount[a] harvested by community	95% conf. limit
	Using	Attempting harvest	Harvesting	Receiving	Giving away	Total for community	Mean per household	Mean per capita		
Berries										
Blueberry	86.7%	66.7%	66.7%	37.9%	51.7%	385.2 lb	10.7 lb	2.3 lb	96.3 gal	± 23%
Lowbush cranberry	66.7%	60.0%	60.0%	17.2%	34.5%	355.2 lb	9.9 lb	2.2 lb	88.8 gal	± 26%
Highbush cranberry	3.3%	3.3%	3.3%	3.3%	0.0%	24.0 lb	0.7 lb	0.1 lb	6.0 gal	± 83%
Crowberry	10.0%	10.0%	10.0%	3.4%	3.4%	19.2 lb	0.5 lb	0.1 lb	4.8 gal	± 50%
Salmonberry	40.0%	23.3%	23.3%	24.1%	13.8%	127.2 lb	3.5 lb	0.8 lb	31.8 gal	± 37%
Subtotal	**86.7%**	**66.7%**	**66.7%**	**43.3%**	**50.0%**	**910.8 lb**	**25.3 lb**	**5.5 lb**	**227.7 gal**	± 22%
Plants/greens/mushrooms										
Wild rhubarb	3.3%	3.3%	3.3%	0.0%	0.0%	48.0 lb	1.3 lb	0.3 lb	12.0 gal	± 83%
Eskimo potato	10.0%	10.0%	10.0%	3.3%	6.7%	25.2 lb	0.7 lb	0.2 lb	6.3 gal	± 53%
Hudson's Bay (Labrador) tea	3.3%	3.3%	3.3%	0.0%	0.0%	0.6 lb	0.0 lb	0.0 lb	0.6 gal	± 83%
Sourdock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Willow leaves	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Stinkweed	6.7%	6.7%	6.7%	0.0%	3.3%	1.8 lb	0.1 lb	0.0 lb	1.8 gal	± 61%
Unknown greens from land	0.0%	0.0%	0.0%	0.0%	0.0%	0.0 lb	0.0 lb	0.0 lb	0.0 gal	± 0%
Subtotal	**20.0%**	**20.0%**	**20.0%**	**3.3%**	**10.0%**	**75.6 lb**	**2.1 lb**	**0.5 lb**	**20.7 gal**	± 50%
Wood										
Roots	3.3%	3.3%	3.3%	0.0%	0.0%	*Primarily used in crafts and/or as firewood.*				
Other wood	80.0%	50.0%	50.0%	53.3%	20.0%	*Primarily used as firewood.*				
Subtotal	**80.0%**	**50.0%**	**50.0%**	**53.3%**	**20.0%**	***Primarily used in crafts and/or as firewood.***				
All vegetation	**100.0%**	**86.7%**	**86.7%**	**80.0%**	**66.7%**	**986.4 lb**	**27.4 lb**	**6.0 lb**	**248.4 gal**	**± 21%**
All resources	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**90.0%**	**50,742.6 lb**	**1,409.5 lb**	**308.7 lb**		**± 24%**

Source ADF&G Division of Subsistence household surveys, 2013.

Note "All resources" include all species of fish, wildlife, and plants reported on the survey.

a. Amount of resource harvested is individual units, unless otherwise specified.

Harvest Assessments

The survey asked respondents to assess their household's harvests in 2 ways: whether they used less, the same, or more of 6 resource categories in the study year as in recent years, and whether they got "enough" of each of those categories. It also asked households to do the same assessment of subsistence resources overall. "Recent years" was defined as about the last 5 years. If a household reported a change in use (through a "less" or "more" response) the respondent was asked why. When households said they did not get enough of a resource category, they were asked a series of follow-up questions to determine what species was needed, why the household did not get enough, the severity of the impact to the household, and whether the household did anything differently as a result. Comments that people gave describing what they did differently were characterized and grouped for analysis.

Figure 4-16 depicts responses to the "less, same, more" assessment question and Figure 4-17 depicts responses to the "get enough" assessment questions. Percentages do not include households that did not answer the question or reported that they do not ordinarily use the resource.[5] The latter results in fewer responses for less commonly used categories such as marine mammals, and manifests in the chart as a shorter bar compared to categories such as nonsalmon fish or large land mammals, which are ordinarily used by most households. Therefore, these figures only reflect the responses of households that ordinarily use a resource and provided an answer; a review of Kobuk responses found that, in 6 categories, only 1–3 households skipped the question. In other categories, no households that use the resource skipped the question.

Subsistence harvest success can also be assessed by comparing current harvest estimates with past harvest estimates, which will be discussed in a later section.

5. For example, to ask a household that never uses marine mammals whether it got enough is confusing.

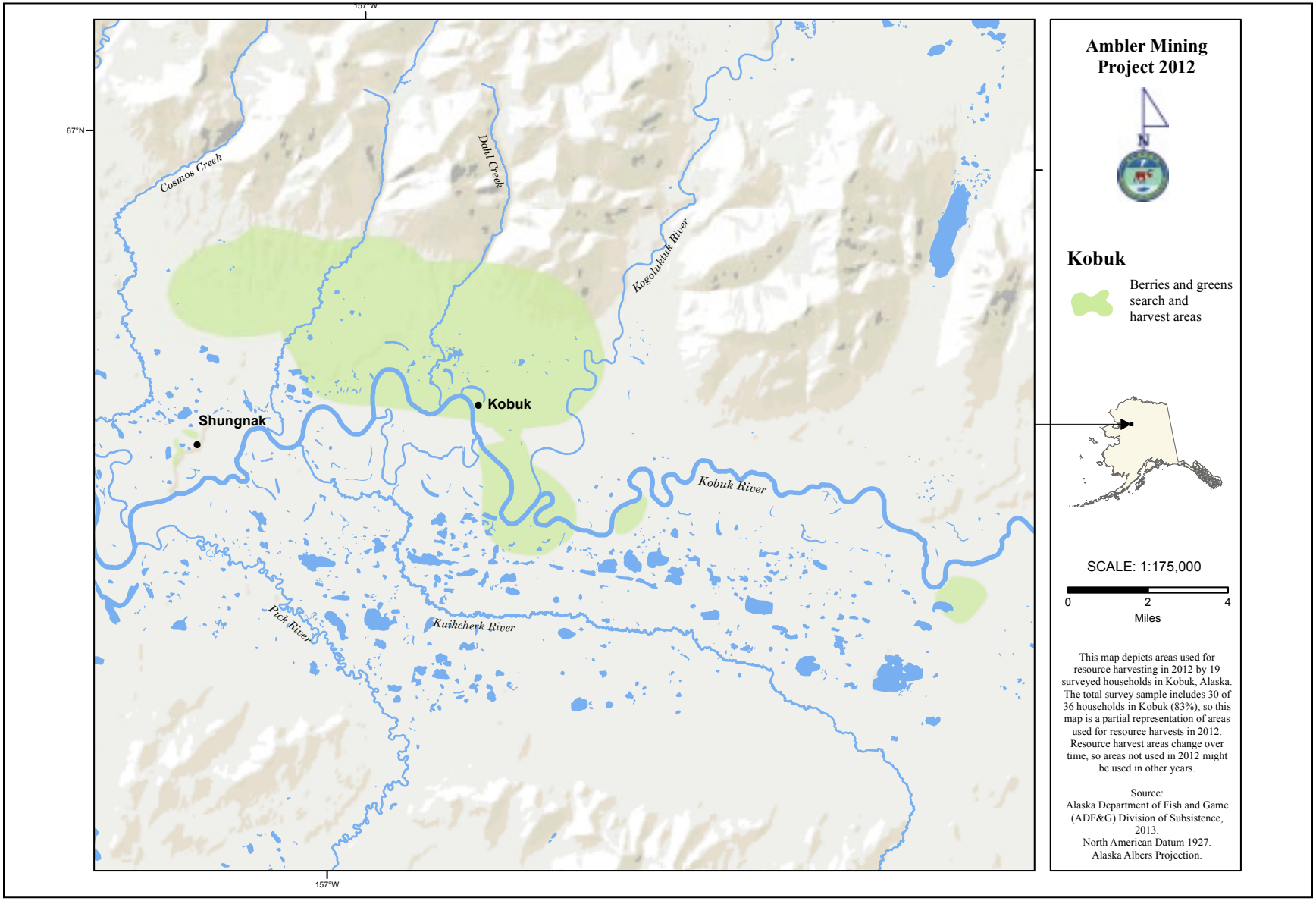

Figure 4-15.–Berries and greens search and harvest areas, Kobuk, 2012.

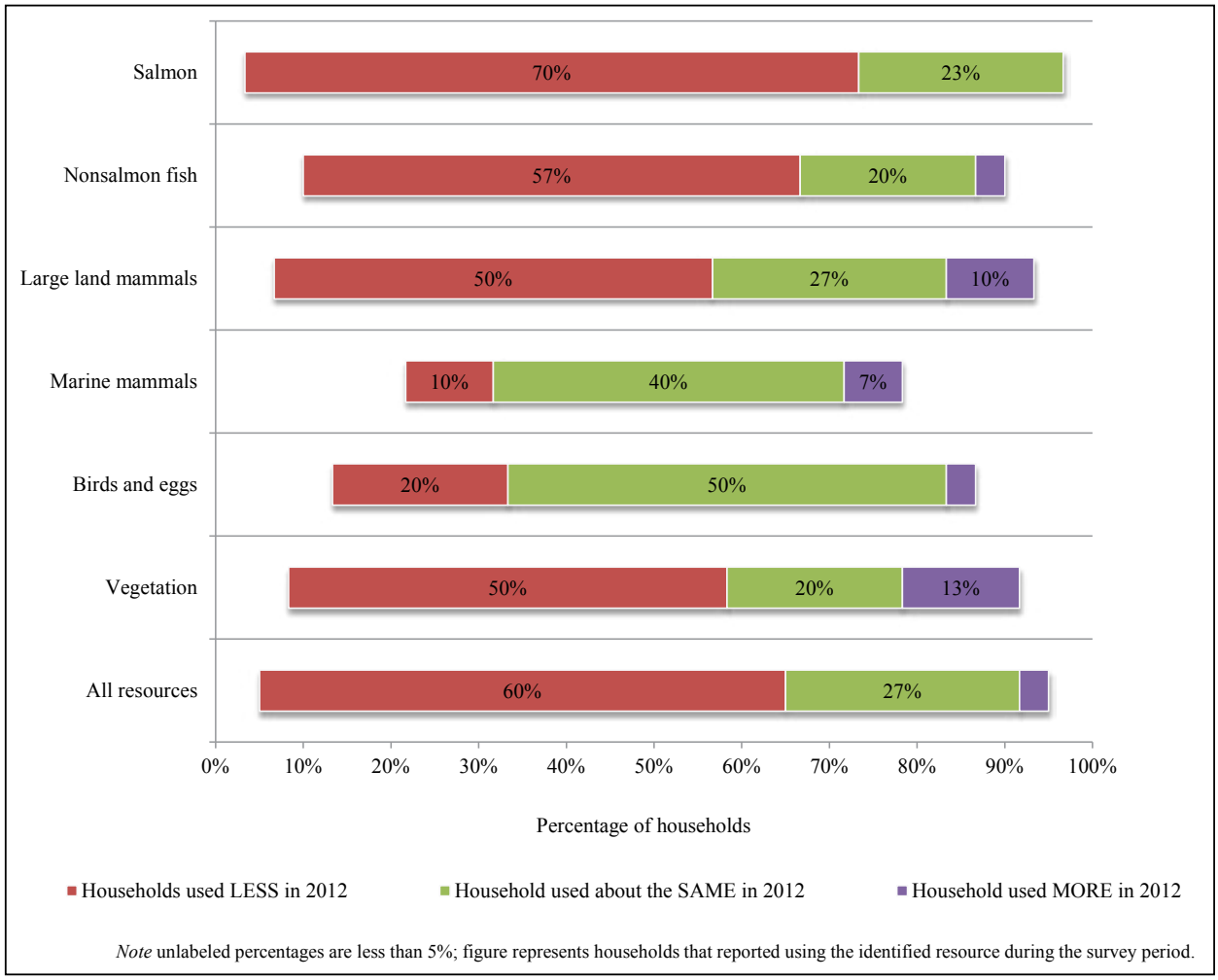

Figure 4-16.–Household uses of resources compared to recent years, Kobuk, 2012.

Generally, the results are presented in this section as they appear in the figures, but it is important to remember that they are not limited to only households that ordinarily use the resource. Additional details are provided in cases where further analysis lends clarity to the discussion of use patterns. Further information on these details can be found in the appendices, including reasons for changes in use patterns (Table D4-11; Table D4-12), resources of which households reported needing more (Table D4-13), reported impact of not getting enough of a resource (Table D4-14), and adaptive changes for not getting enough of a resource (Table D4-15).

Though use of fish species was universal among households, almost all respondents (70%) reported using fewer salmon than in recent years (Figure 4-16). Approximately 57% of the households reported using fewer nonsalmon fish species. Every household that attempted to harvest fish species did so successfully (Table 4-3); however, it would seem that the 2012 harvest was less compared to other years based on respondents' self-assessment of use. The decline was greatly influenced by the weather. As corroborated by respondents' accounts, the unusually wet summer and fall disadvantaged local fishers. Understandably, many households reported that they did not get enough fish to meet their household's needs. Only 43% of respondents that used salmon and 60% of respondents that used nonsalmon fish reported that they got enough (Figure 4-17). Forty percent of households said that the lack of salmon had a major impact on their household and 13% said it was severe (Table D4-14). Furthermore, the lack of salmon made a number of households change their behavior, with 56% of the households doing something differently, such as substituting subsistence foods with commercial foods (Table D4-15).

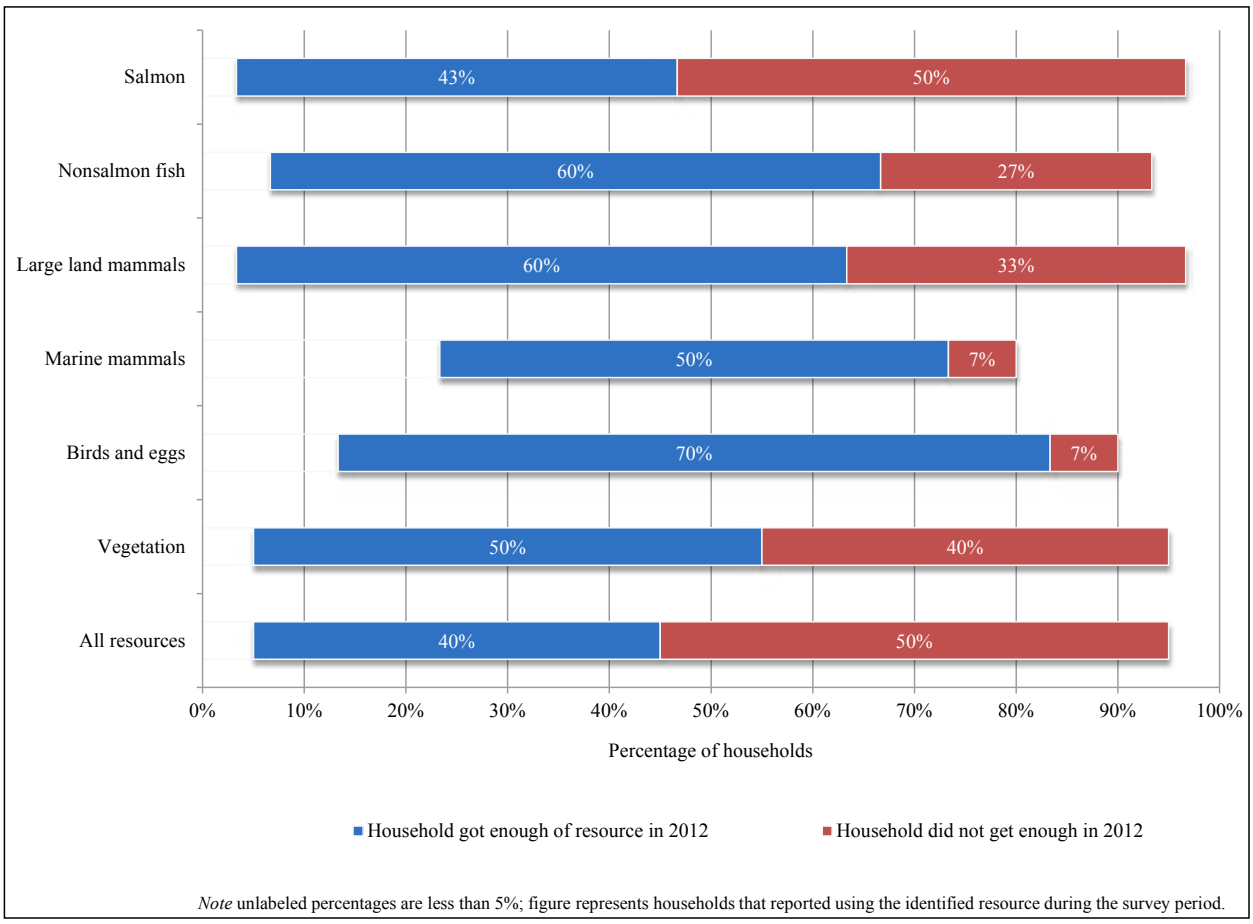

Figure 4-17.–Percentage of households reporting whether they got enough resources, Kobuk, 2012.

Respondents held a mixed evaluation of their 2012 harvest of large land mammals. Fifty percent of the respondents said that they used less land mammal resources in 2012 as compared to recent years (Figure 4-16). The 2 most common explanations for diminished household use was a lack of resource availability (29% of households) and that households lacked the time to hunt (29%) (Table D4-11). Sixty percent of households reported that they got enough large land mammals in 2012 as compared to recent years (Figure 4-17). Respondents gave a variety of reasons as to why they did not get enough land mammals including a lack of resource availability, lack of time to hunt, and a lack of equipment or making less effort to hunt. As with salmon, most households (83%) changed their behavior by substituting more commercial foods (Table D4-15). Of the households that could not get enough, 50% said the lack of large land mammals posed a major impact to their household (Table D4-14).

Taking all the resource categories into consideration, most households (60%) said that they used less subsistence resources in general over the previous 12 months compared to recent years (Figure 4-16). A smaller number, 27% of the households, said they used about the same amount, and only 3% said they used more. Regarding all subsistence resources, 50% of households reported that they did not get enough (Figure 4-17). When households said that they did not get enough of all subsistence resources, 63% said that it had a major impact and 25% said it had a severe impact (Table D4-14).

The assessments module is meant to provide a temporal context to the estimated harvest quantities discussed above. Since, for example, 57% of the households reported using less nonsalmon fish species than in recent years, we can assume that the community of Kobuk generally uses more than 8,329 lb in a typical year. However, the magnitude of the previous harvest cannot be reliably estimated, unless previous projects occurred (see later section: Comparing Harvests and Uses in 2012 with Previous Years). Additionally,

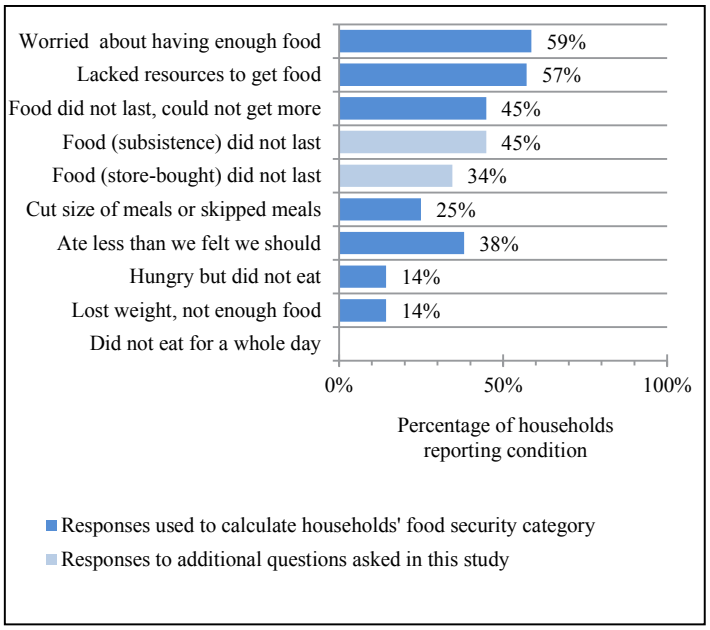

Figure 4-18.–Responses to questions about food insecure conditions, Kobuk, 2012.

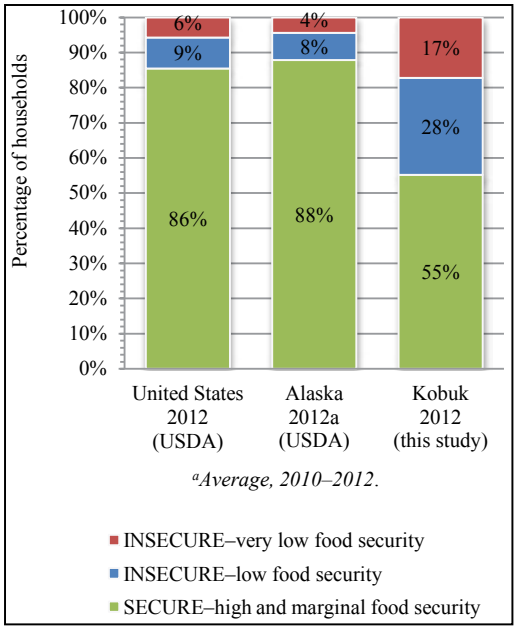

Figure 4-19.–Food security categories, Kobuk, 2012.

interpreting both figures 4-16 and 4-17 together can be counterintuitive. Even though most households reported using less of all categories, many of those households said that they got enough. This suggests the use of coping strategies to mitigate the decline in use, or perhaps a decreasing desire for the resource. Additionally, respondents may feel uncomfortable expressing their needs to a stranger.

Food Security

Survey respondents were asked a set of questions intended to assess their household's food security, defined as, "access by all people at all times to enough food for an active, healthy life" (Coleman-Jensen et al. 2012:2). The food security questions were modeled after those developed by the U.S. Department of Agriculture (USDA) but modified by ADF&G to account for differences in access to subsistence and store-bought foods. Based on their responses to these questions, households were broadly categorized as being food secure or food insecure following a USDA protocol (Bickel et al. 2000). Food secure households were broken down further into 2 subcategories: high or marginal food security. Food insecure households were divided into 2 subcategories: low food security or very low food security.

Households with high food security did not report any food access problems or limitations. Households with marginal food security reported 1 or 2 instances of food access problems or limitations—typically anxiety over food sufficiency or a shortage of particular foods in the house—but gave little or no indication of changes in diets or food intake. Households with low food security reported reduced quality, variety, or desirability of their diet, but they, too, gave little indication of reduced food intake. Households classified as having very low food security were those that reported multiple instances of disrupted eating patterns and reduced food intake (Coleman-Jensen et al. 2012:4).

Core questions and responses from Kobuk residents are summarized in Figure 4-18. Positive responses to instances of food insecurity follow a predictable pattern. Researchers asked respondents a series of questions. Respondents typically answered affirmatively to less severe conditions, and negatively to more severe conditions of food insecurity. More than one-half of the households (59%) expressed anxiety over acquiring enough food. More severely, many households described limited access to food: 57% said they were unable to get the food they desired because they lacked material resources, and 45% said that food did not last and that they could not get more. Many households experienced food disruption—instances when

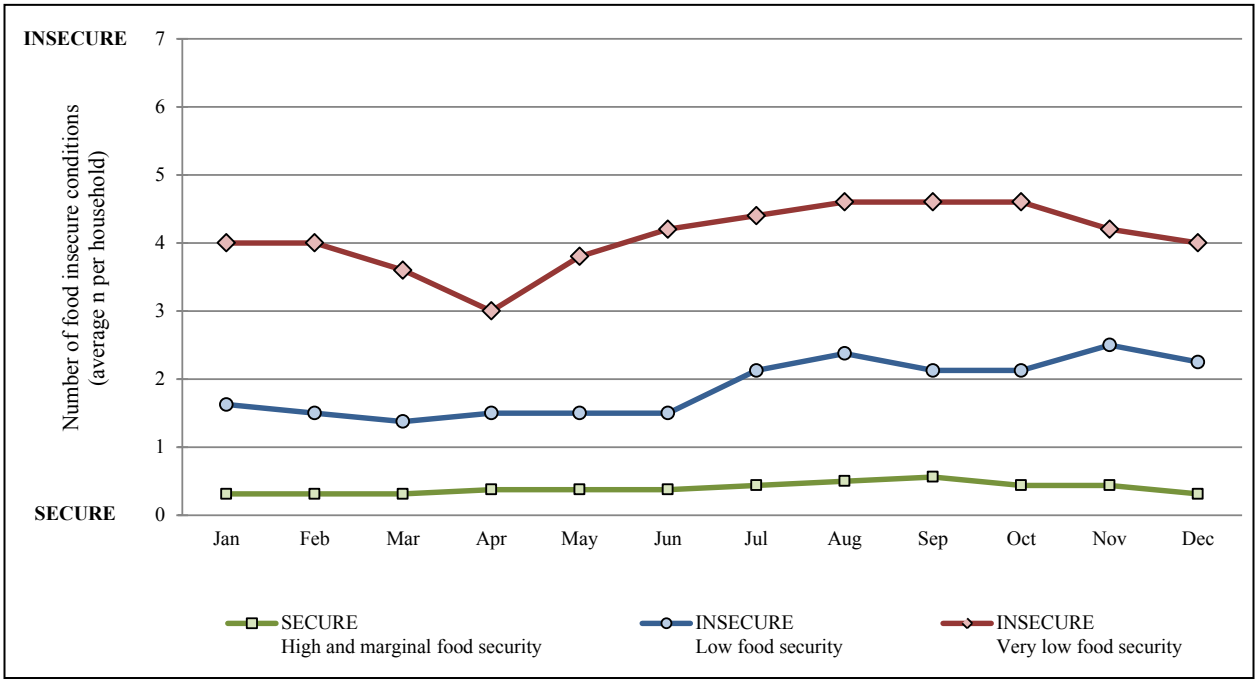

Figure 4-20.–Mean number of food insecure conditions by month and by household security category, Kobuk, 2012.

they reduced their consumption of subsistence or store-bought food. Thirty-eight percent of the surveyed households said that they ate less than they felt they should.

Food security results for surveys for Kobuk, the state of Alaska, and the United States are summarized in Figure 4-19. Kobuk has a relatively large portion (17%) of households that are characterized as having very low food security. This category accounted for only 4% of the households at the state level. Twenty-eight percent of Kobuk households had low food security.

Figure 4-20 portrays the mean number of food insecure conditions per household by food security category by month. Food secure households remained relatively secure throughout the year with very little variation. Households with low food security cited more conditions of insecurity beginning in June and lasting until December. Households may feel insecure during the second half of the calendar year because of a less-than-normal harvest (see Harvest Assessments, above) or lack of material resources to harvest food. Households with very low food security had elevated food insecurity during the same time period, although they expressed relief during the month of April.

Household Specialization in Resource Harvesting

Previous studies by the Division of Subsistence (Wolfe 1987; Wolfe et al. 2010) have shown that in most rural Alaska communities, a relatively small portion of households produces most of the community's fish and wildlife harvests, which they share with other households. A recent study of 3,265 households in 66 rural Alaska communities found that about 33% of the households accounted for 76% of subsistence harvests (Wolfe et al. 2010). Although overall the set of very productive households was diverse, factors that were associated with higher levels of subsistence harvests included larger households with a pool of adult male labor, higher wage income, involvement in commercial fishing, and community location.

As shown in Figure 4-21, in the study year in Kobuk, about 70% of the harvests of wild resources as estimated in usable pounds was harvested by 27% of the community's households. The characteristics of highly productive households will be discussed in the Wild Food Networks section of this chapter.

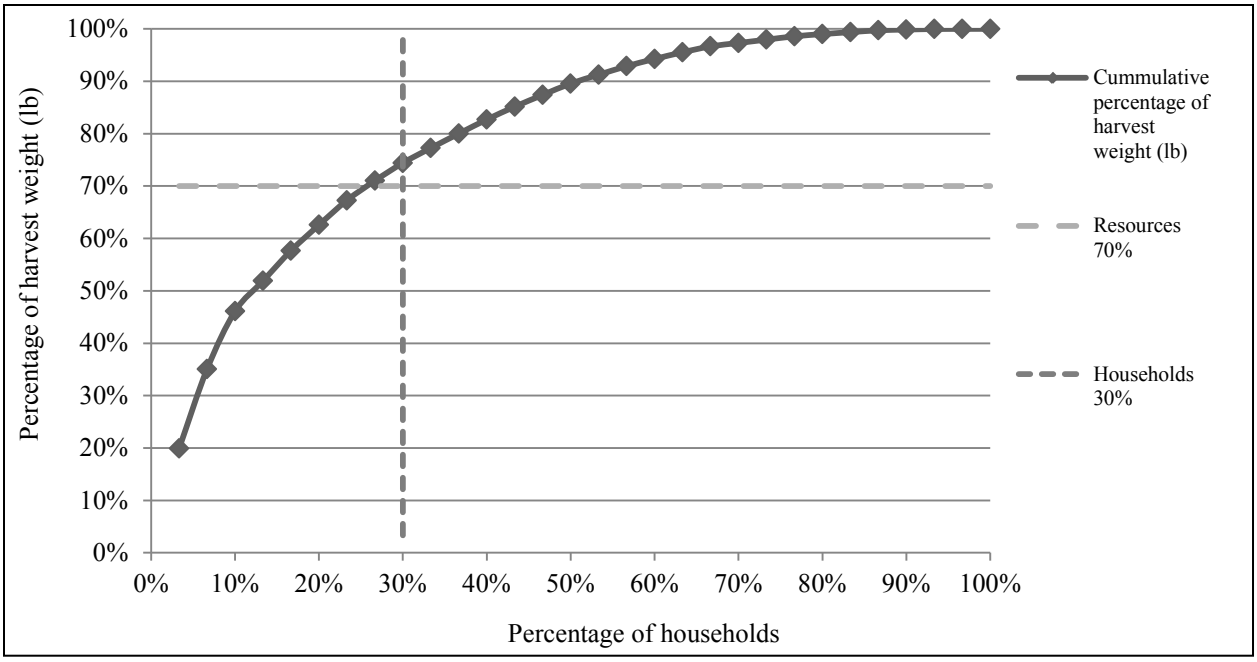

Figure 4-21.–Household specialization, Kobuk, 2012.

Wild Food Networks

Although subsistence harvest surveys collect information based on individual households, in reality, much of the production (harvest and processing) of subsistence foods is achieved by households within a community that work cooperatively. This cooperation is often organized along kinship lines or based on other imporant social ties found in communities with Alaska Native histories. The organization of contemporary mixed market–subsistence economies that are predominant in rural Alaska communities has been documented ethnographically by numerous researchers. Of particular interest for northwest Alaska are reports from Anderson et al. (1977), Burch Jr. (1988), Ellanna (1983), Langdon and Worl (1981), Alaska Department of Fish and Game (1990), Magdanz et al. (2002), Wolfe and Walker (1987), Wolfe and Ellanna (1983), and Fall (1990).

Cooperation in the production of foods is only part of the picture. Subsistence foods are widely distributed among households within a community through sharing, barter, and trade (Charnley 1984; Kari 1983; Lonner 1980; Magdanz and Wolfe 1988; Magdanz 1988; Magdanz et al. 2007; Moncrieff 2007; Pete 1991; Schroeder, Andersen, Bosworth, et al. 1987; Stickney 1984; Wolfe et al. 1993).

In this study, survey questions asked households who harvested and processed the subsistence foods they used during the year. If a resource was received by a household, the respondent was also asked which household in the community shared or traded that resource with them. Confidentiality was preserved by identifying households only by a random identification number. If a source household lived in another community, the name of the community was recorded.

Figure 4-22 depicts a network of wild food exchanges[6] between households in Kobuk and with households in other Alaska communities. The figure is a partial representation of sharing, trade, and barter during the 2012 study year because it only documents the food flows into the 30 surveyed households. Symbol shapes depict the type of household; their colors show the age of heads of household, and their sizes are scaled to indicate the amount of a household's subsistence harvest by edible weight. Arrowed lines show the direction of the exchange and are weighted to show multiple exchanges. Households or communities near

6. These exchanges may be goods (subsistence foods) or services (labor, i.e. harvesting or processing of subsistence foods).

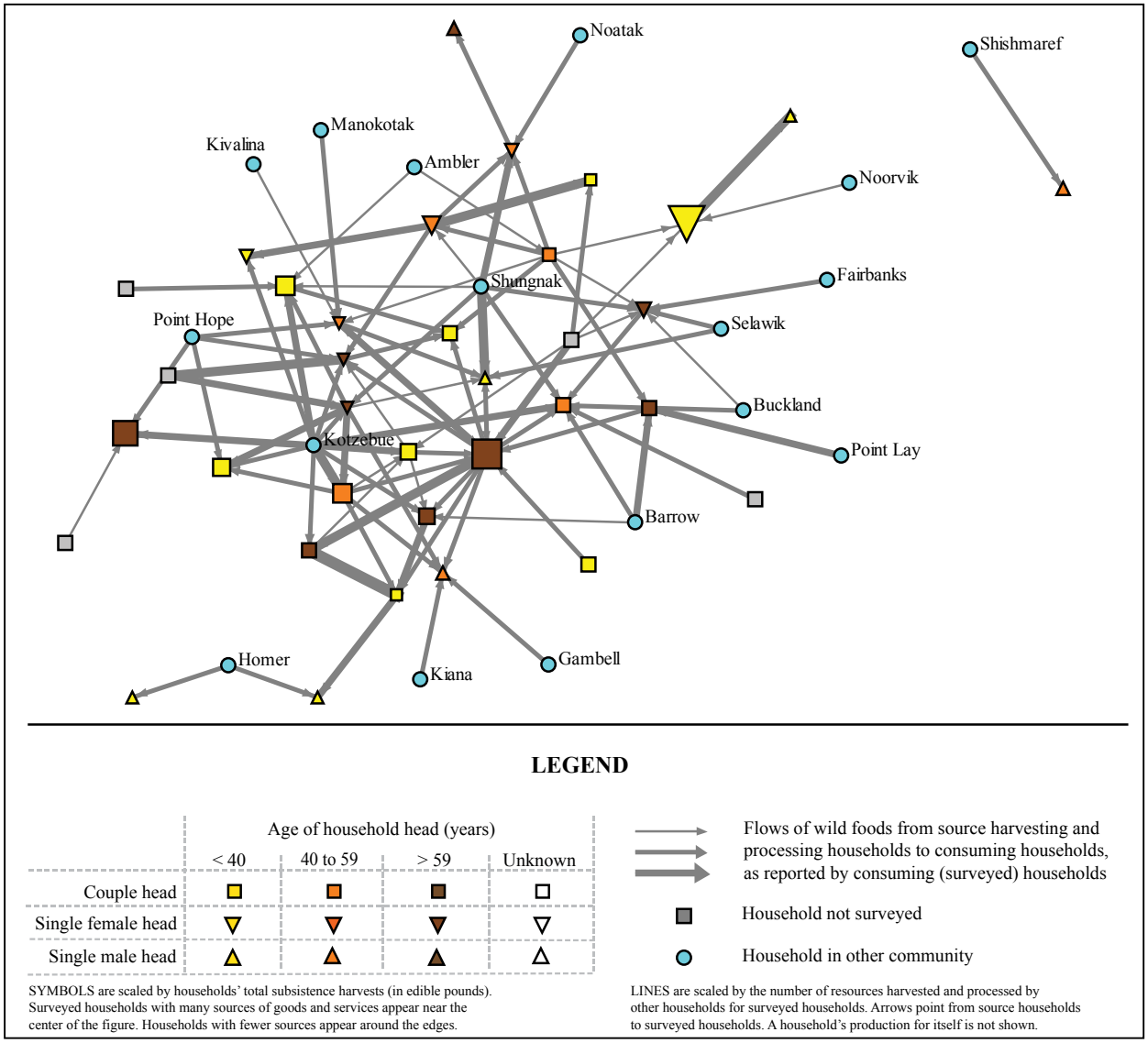

Figure 4-22.–Wild food harvesting and processing network, Kobuk, 2012.

the center of the figure were the most active in the network, either by receiving food from others or being identified as a source by others.

Previous studies have found a positive association between the ages of household heads and the amount of subsistence foods harvested. Household characteristics associated with higher food production include those households with multiple working-age males, involvement with commercial fishing, and higher wage incomes. Characteristics common to lower producing households included female household heads, age of elders, non-Native household heads, and single-person households (Wolfe et al. 2010). Household "developmental cycles" (i.e., the relative age or "maturity" of household heads and number of productive household members) have also been associated with harvests.

The largest producing household had characteristics of those expected to have high subsistence production. It was an elder couple, located centrally in Figure 4-22, that shared both support and recipient roles with 14 other households. The second largest producing household was a developing single female household which does not fit the model discussed in previous research. Furthermore, because of the node's

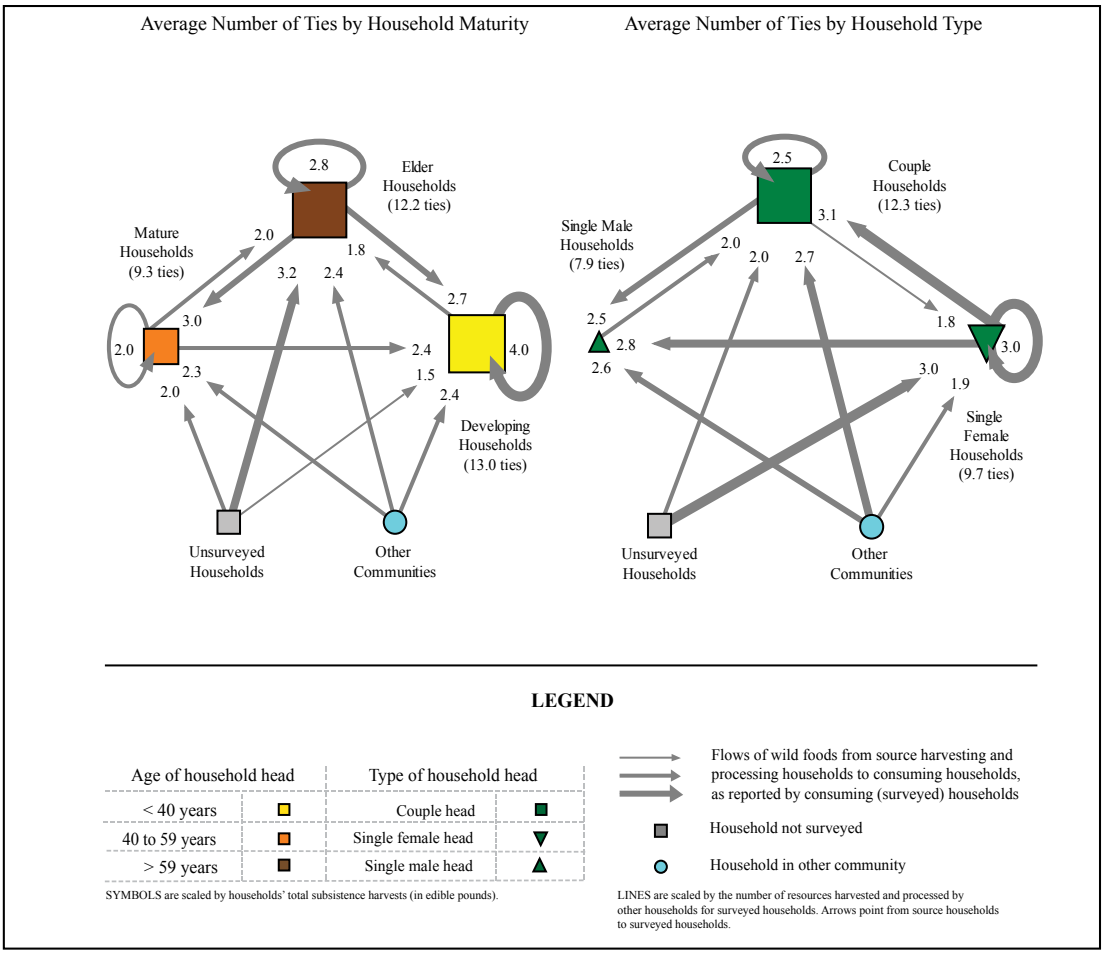

Figure 4-23.–Wild food harvesting and processing network by household maturity and type, Kobuk, 2012.

position to the far upper right of Figure 4-22, the household has connections to only 4 other nodes. All other elder households were primarily recipients of support from others. On average, households shared services with 4 other households.

There were no isolates, or households that did not share sources with another household, although 1 mature single male household only received support from Shishmaref. Two communities were very central in Kobuk's network. The downriver community of Shungnak shared with 7 Kobuk households a total of 20 times. The regional hub, Kotzebue, was even more central. Kotzebue households shared with 11 households a total of 34 times. This suggests that regional hubs may play a strong role in a small community's subsistence economy.

The 30 surveyed households in Kobuk reported 52 sources of support, with most sources of support residing in Kobuk. On average, Kobuk households were connected to 4 other households or communities. The minimum number of sources was 1, seen for 1 household on the lower middle area of Figure 4-22, while the maximum number reported was 14. Kobuk households reported sources in 17 other Alaska communities, 9 of which were in the Northwest Arctic Borough.

Figure 4-23 depicts the Kobuk wild foods network with individual households collapsed into groups by household maturity and types of heads. Their average harvests are represented by the size of symbols. Developing households, on average, harvested more wild food (by edible weight) than elder households; both types harvested more than mature households.

Elder and developing households had similar numbers of sources, averaging 12 and 13 sources each, respectively. While developing households harvested more subsistence foods, they were less a source of support for elder and mature households than vice versa. No mature households identified developing households as a source. All 3 household age groups had, on average, similar sources of support from other communities. Looking at household structures, couple households produced far more than either single female-headed households or single male-headed households. Single female-headed households harvested more than their single male-headed household counterparts. No single female-headed households reported any single male-headed households as sources. Single female-headed households also had more sources from unsurveyed households than did couple-headed or single male-headed households, which may account for why they seemed to be a greater source to couple and single male-headed households.

Comparing Harvests and Uses in 2012 with Previous Years

Harvest Data

Changes in the harvest of resources by Kobuk households can also be discerned through comparisons with findings from other study years.[7] Subsistence harvest surveys were conducted in Kobuk beginning in 1994, and each inquired about specific resource categories. From the years 1994 to 2004[8], the Division of Subsistence paired with the Maniilaq Association and National Park Service to investigate fish harvest trends in Kobuk and 5 other communities (Magdanz et al. 2011). In 2004 and 2009, the Division of Subsistence conducted surveys of large land mammal harvests by communities that harvest from the Western Arctic caribou herd (Braem 2012). This study is the first comprehensive harvest survey ever conducted in Kobuk. The following section is a comparison of data presented in this study to findings of past harvest surveys.

Fish harvests in northwest Alaska experience inter-annual variability. Magdanz et al. (2011) found that the combined harvest of salmon, whitefishes, and Dolly Varden increased by 2%[9] annually between 1994 and 2004, ranging between 6,787 lb and 61,833 lb. This study for 2012 documented a harvest of 28,350 lb, which falls in the range (Table 4-3). However, by examining the harvest history of individual species, clearer trends appear.

The strongest trend found by Magdanz et al. (2011) was a 7% decline in chum salmon harvest in 6 northwest Alaska communities. In Kobuk, the smallest study community, the salmon harvest declined by 5%; however, this decline may be influenced by the abnormally high 1994 harvest of 6,369 chum salmon (Magdanz et al. 2011:15, 47). The 2012 harvest of 2,637 chum salmon is at the upper end of the historical range (Figure 4-24). A second notable finding for 2012 is the harvest of 14 coho salmon, which are normally not harvested. Chinook salmon harvests were also low, ranging between 0 and 4 (Magdanz et al. 2011:47) (Table 4-3).

Sheefish harvests varied more widely than harvests of chum salmon (Figure 4-25). For those years data are available, the 1994 to 2012 average harvest is 656 individual fish, and ranges between 32 and 1,218 fish. The 2012 harvest of 1,062 sheefish was at the high end of the harvest range. The high harvests occurred at the more recent end of the time series depicted in Figure 4-24. There are no data for sheefish harvests for the years 2005–2011.

Some historical data are available for other whitefishes harvests from 1997–2004, although earlier reports (Magdanz et al. 2011) aggregated all species of whitefishes. Whitefish harvests seem to vary greatly. Harvests

7. WinfoNet data, maintained by the Division of Wildlife Conservation, based on harvest ticket or permit returns, are not included in this discussion of historical harvests because of concerns that in some regions of Alaska the data do not accurately capture subsistence harvests. One evaluation of such data, by Susan Georgette, found that Western Arctic caribou harvest permit or ticket data captured only 10% of subsistence harvests when compared to subsistence survey data (Susan Georgette, *Summary of Western Arctic caribou herd overlays [1984–92] and comparison with harvest data from other sources*, Alaska Department of Fish and Game Division of Subsistence, unpublished data, 1994. The manuscript of this work is on file with ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701).

8. Fish harvest surveys were not conducted in Kobuk for the study year 2002.

9. Percent change calculated by dividing harvest trend by average harvest.

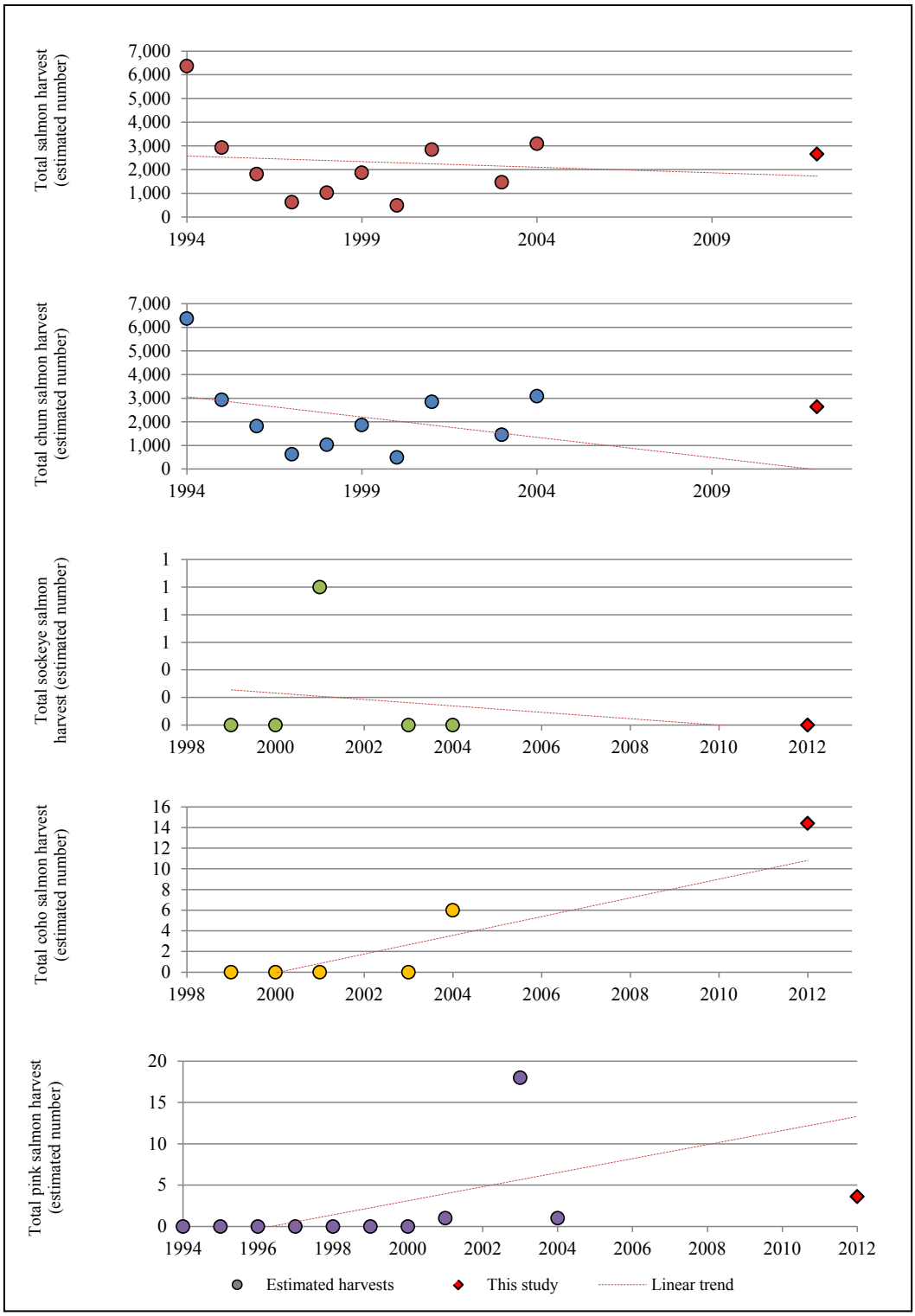

Figure 4-24.–Estimated number of salmon harvested, Kobuk, 1994–2004 and 2012.

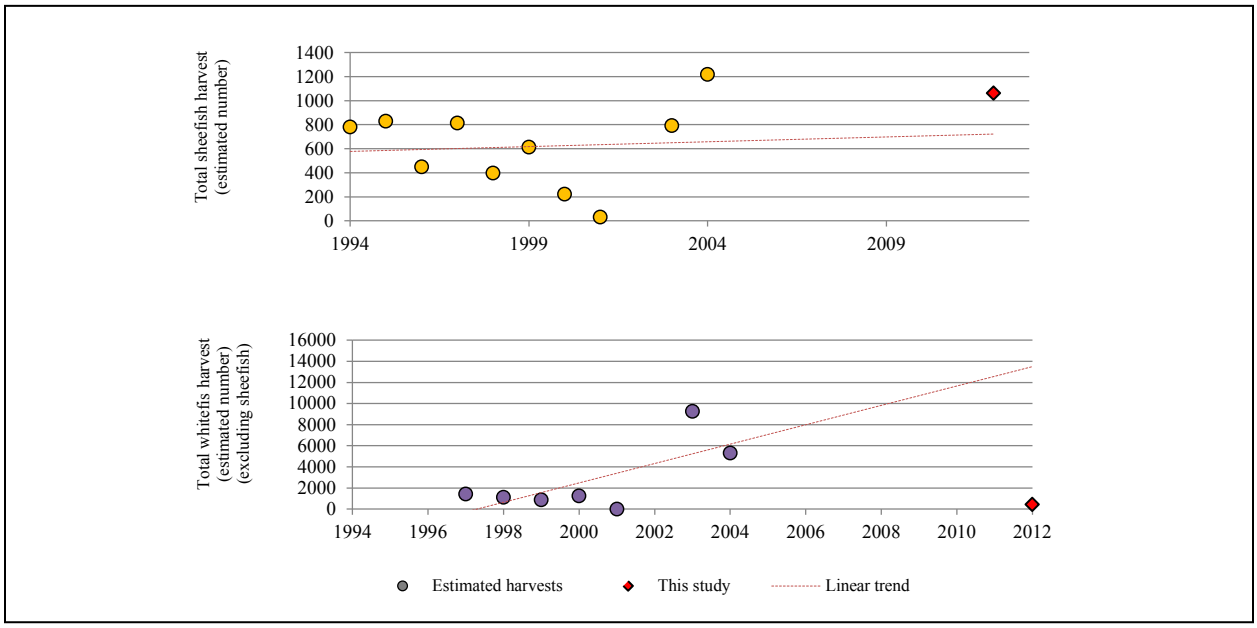

Figure 4-25.–Estimated number of sheefish and whitefishes harvested, Kobuk, 1994–2001, 2003–2004, and 2012.

of whitefishes in 2003 were 10 times greater than the 1997–2001 average of 932 fish harvested annually. The 2012 harvest of 443 total whitefishes (other than sheefish) fell far below the average for 1997–2001.

Wildlife harvest information based on household surveys is sparse. Only 3 years of information—2004 (CSIS[10]), a fall 2009 to spring 2010 study period (Braem 2012), and 2012 (this study; Table 4-4)—are available. Due to the lack of data, wildlife harvest trends should not be inferred. However, these 3 estimates can provide a historical range of harvest (Figure 4-26).

Caribou are a historically important species to Kobuk residents. Residents in Kobuk have maintained a steady rate of use of caribou (86% to 93% of households) for the 3 study periods, but harvest levels have varied. Kobuk caribou harvests have averaged 154 individual animals, and ranged from 119 to 210 animals; the 2012 harvest marks the low end of the range. Residents harvested approximately 98 lb per capita during this study year (Table 4-4), or about one-half of the 194 lb per capita documented for the 2009–2010 study period (Braem 2012).

The 2012 moose harvest was also lower than previously documented harvests (Figure 4-26). The 2012 harvest of 4 moose was less than the average of 6.5 moose harvested for 2004 and 2009–2010. The amount of moose harvested per capita amounted to 31 lb in 2004 and dropped to 22 lb in 2009, and 12 in 2012. This drop in per capita harvests corresponds with a drop in hunting participation. In 2004, more than one-half of the households in Kobuk both attempted to harvest and used moose (68% and 64%, respectively) (CSIS). In 2009, only about one-third of community households did both, similar to 2012 (CSIS).

Bird harvests for Kobuk were previously documented for 1996 (Georgette 2000) and 2006 (Naves 2010rev.). Those studies were conducted by the Division of Subsistence in coordination with Maniilaq Association and the Alaska Migratory Bird Co-Management Council (AMBCC) and harvest data for both study years are available in the CSIS. Unfortunately, due to AMBCC policy, the later project reports harvests at a regional rather than community level, so only comparisons between 1996 and this study year can be made. However, because the 1996 and 2012 studies use different species weight conversion factors, only the number of individual birds harvested can be compared. Bird harvests between both years are very similar. Hunters harvested a total of 793 birds in 1996 compared to 788 during 2012. In 1996, this broke down into

10. Alaska Department of Fish and Game (ADF&G) Division of Subsistence, Juneau. "Community Subsistence Information System (CSIS)." Accessed May 2014. http://www.adfg.alaska.gov/sb/CSIS/

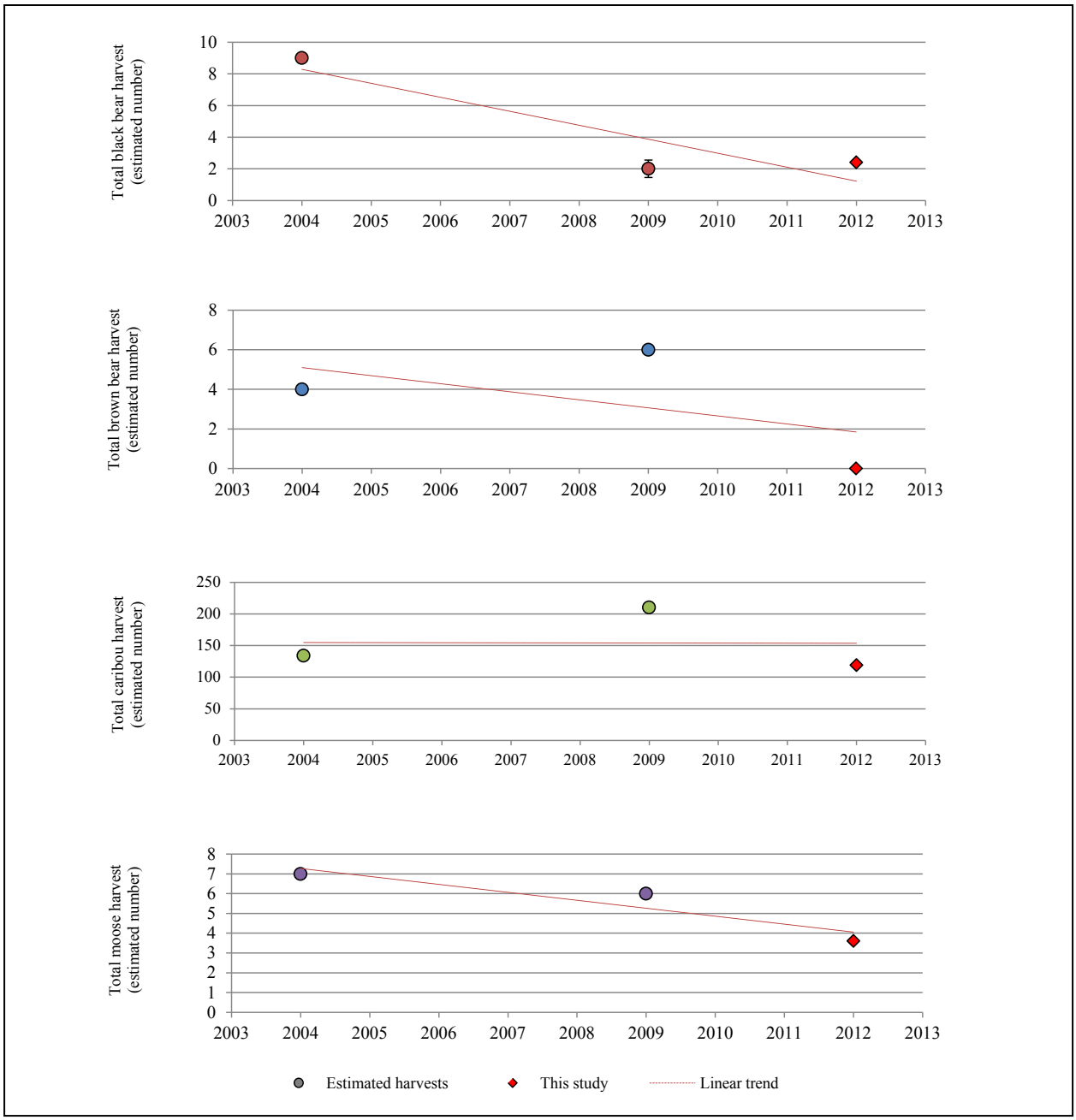

Figure 4-26.–Estimated number of black bear, brown bear, caribou, and moose harvested, Kobuk, 2004, 2009, and 2012.

48% ducks, 41% geese, 10% upland birds, and less than 1% of other migratory birds. This composition is similar to the 2012 study year which included 41% ducks, 37% geese, and 22% upland game birds.

Current and Historical Harvest Areas

Community subsistence mapping sessions were conducted in Kobuk during 1985 and 1986 (Schroeder, Andersen, and Hildreth 1987) (Figure 4-26), and geospatial harvest information was collected in 2009 (Braem 2012). Schroeder et al (1987) depicts a maximum extent of land use by 20 Kobuk respondents during the duration of their lives. This method varies from that of this study and Braem (2012), in that it depicts a lifetime of activity rather than just a single year. As such, lifetime use areas will be comparably

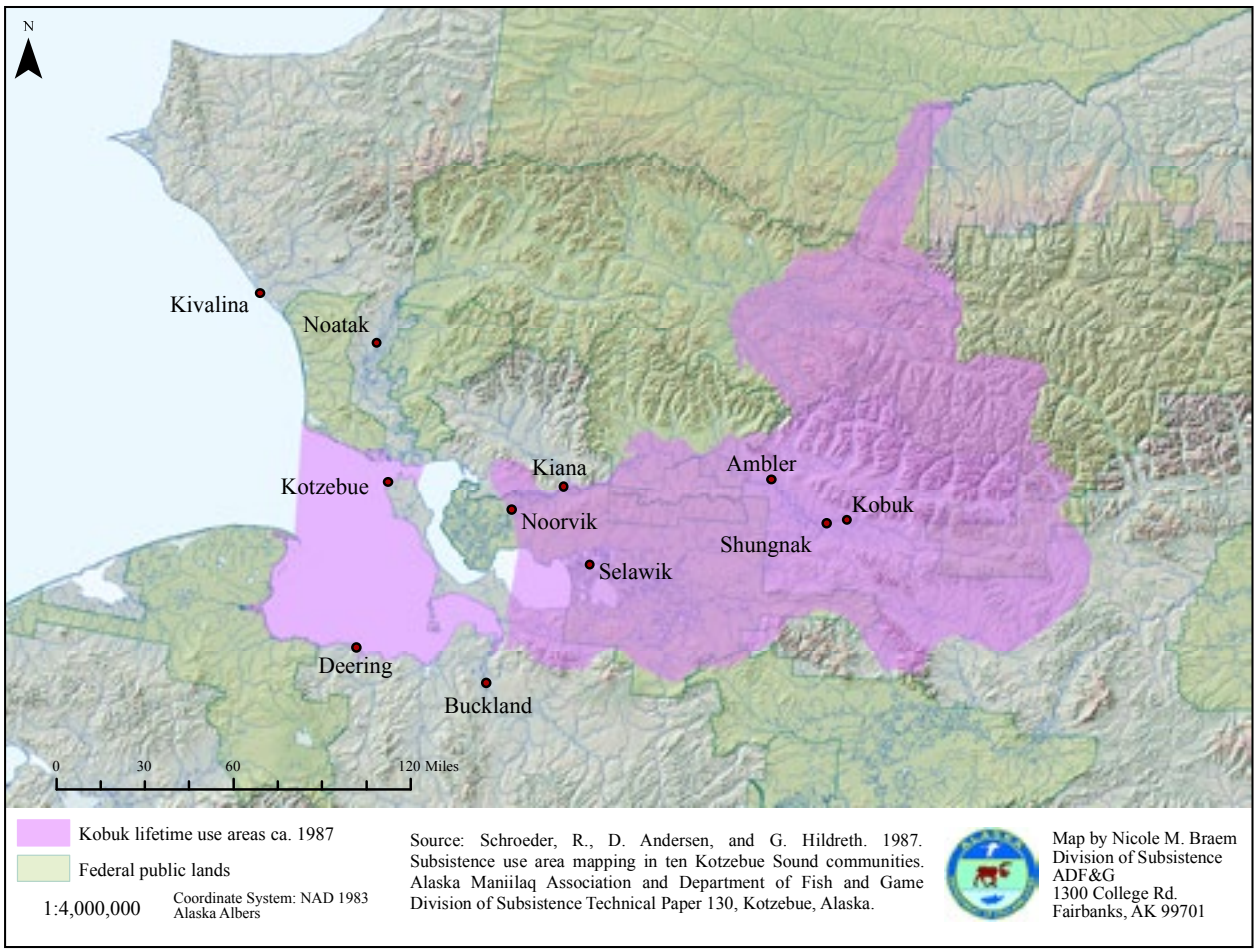

Figure 4-27.–Lifetime harvest and use areas, Kobuk, 1987.

larger than areas documented by single-year studies. Respondents identified 10 U.S. Geological Survey (USGS) quadrangle maps[11] in which they harvested or searched for subsistence resources. Fish, both salmon and nonsalmon fish species, were harvested along the Kobuk River from Shungnak to Beaver Creek, as well as along the Mauneluk River. Fish were also caught in the tundra lakes south of the community, in the Pah River flats, and Norutak Lake.

Kobuk residents reported spanning the most land in search of caribou and other land mammals. Caribou hunters reported using the entire Kobuk River and Selawik watersheds in search of caribou. They also used mountain tributaries between the Kobuk and Noatak rivers. Hunters primarily used the upper half of the Kobuk River watershed and its tributaries in search of both black and brown bears. They also used a portion of the Hog River, in the Koyukuk River watershed. They used the same areas to search for moose. Hunters searched for Dall sheep in the mountains north of the community that occupy an area between the Kobuk River and headwaters of the Noatak River.

Furbearers and other small game targeted by Kobuk residents occupied drainages of the Koyukuk, Kobuk, Noatak and Colville rivers.

Kobuk hunters also searched for marine mammals in Kotzebue Sound—primarily in between Cape Krusenstern and Cape Espenberg.

11. USGS quadrangle maps are printed at 1:250,000 scale. They measure 3 degrees of longitude by 1 degree of latitude.

Braem (2012) recorded large land mammal harvest information by universal coding units (UCUs[12]). This method only records harvest locations and attributes harvest over a broad geographic area. In contrast, this study recorded search areas, or the entire area over which residents searched for particular species. Though the 2 surveys differ in their mapping methods, they have similar intent: to depict patterns of land use. Aggregating use patterns into a community-wide picture also protects the anonymity of individuals in the surveyed community. Hence, comparisons between the 2 must be made carefully; records of harvest locations can infer search areas, but a recorded hunting area does not necessarily imply a harvest.

In 2009–2010, Kobuk residents harvested 78% of the caribou harvested for that study period along the river between the communities of Kobuk and Ambler (Braem 2012). Twelve percent of Kobuk's 2009–2010 caribou harvest was harvested upriver of Kobuk. This area largely conforms to the search area documented for caribou in this study except for 1 important difference: no harvests were reported in the UCU that encompasses the popular Onion Portage area. Most of the harvests, however, were conducted just upstream of Ambler. It may have been that Kobuk hunters found sufficient numbers of caribou close to the community in 2012.

Local Comments and Concerns

Following is a summary of local observations and concerns regarding wild resources that were voiced during the household surveys, the key respondent interviews, and the community review meeting of preliminary data. The summary of these opinions is not necessarily shared by the entire community. However, the issues described here were common, and provide important points of discussion about the ability of Kobuk residents to obtain multiple resources in a manner sufficient to meet their needs.

Climate

Abnormal climate patterns were in the forefront of most respondents' minds during the February 2013 data collection effort. The upper Kobuk River had experienced its second abnormally warm, wet fall weather season followed by a delayed winter freeze-up. After winter took hold, temperatures warmed intermittently above freezing, creating rain events. "This is the worst fall I ever seen in my whole life up here. After it freeze-up it [the river ice] start moving, that's why it's all piled up across there" (OBU02021013). Piled, frozen ice created problems for fishing and transportation for the remainder of the winter.

As discussed above, fall is a key season for residents to target salmon and nonsalmon fish species. Increased rain, beginning as early as August, and the high river water that accompanies it, inhibits fishers' ability to target all species of fish. Secondly, the moisture precludes fish from becoming completely dried, as discussed below. Though rain has been a challenging, though common, feature of fall fishing in years past (Anderson et al. 1977; Burch Jr. 1998), key respondents feel that in recent years they have been abnormally affected by sustained fall precipitation.

This trend has been noted in other studies documenting subsistence users' long-term observations of climate and its effects on subsistence fishing in Interior Alaska.[13] Experienced fishers in 3 different regions of the Yukon River generally agreed that the landscape is becoming increasingly drier, rivers are eroding, permafrost is thawing, and lakes are drying. Furthermore, these observations were corroborated in a cross-regional comparison with fishers in northwestern Alaska. Among the northwestern Alaska study communities was Shungnak, whose respondents agreed among themselves that it now rains more in the fall than it had in the past.

Residents reported that seining, in particular, was difficult during high water periods (Plate 4-4). Residents targeting salmon with seine nets rely on sight to target groups of fish. When the water is high, fishers cannot

12. Universal Coding Units are geographical areas usually based on river drainages and vary in size.
13. David B. Andersen, Brittany Retherford, and Caroline Brown, *Climate change and impacts on subsistence fisheries in the Yukon River drainage, Alaska,* 2013 Annual Report by Research North and Alaska Department of Fish and Game Division of Subsistence, Fisheries Resource Monitoring Program Project 10-250, unpublished data, 2013. The manuscript of this work is on file with ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

UAF-2010-107-65 Charles Crabaugh papers

Plate 4-4.–Seine fishing for chum salmon on Kobuk River in 1949.

see fish through the turbid water. Furthermore, strong currents make handling a small skiff and net difficult and dangerous, and the gravel bars used by the anchorman are submerged. Hook and line fishing is also less effective, as 1 respondent indicated, because sheefish and Arctic grayling, which target lures by sight, cannot locate the lure through the turbid water.

As the data show, residents primarily used setnets to target fish during the study period. Left in the water, they remain effective, although they require more frequent attendance due to the amount of debris that accumulates along the corkline and webbing.

Though high, turbid water increases the difficulty of harvesting fish, it is the preservation techniques that are most affected when the weather is either too warm or too wet. Drying fish is the preferred method of preservation because it allows residents to process a winter's supply of fish in a very short time. It also allows the product to be stored at ambient temperature and not consume valuable space in a freezer. Sustained rain and moisture lead to fish spoilage on the racks.

> Well it seems like we have a lot more rain than in the fall time, which really affects the way that you can dry. I mean those first 10 years I was around, it seemed like we would just have you know, 6 to 8 weeks of beautiful windy weather without any clouds and no rain. And you know we could just hang any much fish without worry about rain, and then the last 15 years it seems like you know you might get a week-and-a-half of good weather, but you might also have your fish hanging and then we had maybe 300 fish under this rack [she] and I, um, they hung for a long time, without drying because it was so cool, it was cold, they didn't spoil like that but she said she got really sick when she ate some off of that rack and I think they just, they didn't taste bad but they just hung so long without drying. Yeah. (OBU03021013)

Following the prohibition of waste, fish that spoil on the racks are fed to dogs, and fishers refrain from harvesting any more fish until the weather passes. Unfortunately, this may occur after the resource becomes unavailable.

One fisher discussed relying on winter fishing opportunities when the summer harvest was insufficient. He said simply, "When we don't catch enough for the winter to feed everybody, you gotta make a fish trap" (OBU02021013). Building a fish trap to target burbot was the most discussed method of winter fishing used by Kobuk fishers. However, this method is also challenged by delayed winter. "We, usually by October, we used to get our traps done, my dad by November. Thanksgiving we'll be able to eat some *tittaaliq* [burbot]. Nowadays their traps are getting done after potlatch, like after November, because of the river freezing so late nowadays" (OBU04020813). Setting a trap during the winter of 2012–2013 was impossible because the ice broke and refroze. Fishers could not cut holes in the jumbled ice to place the trap.

User Conflict

User conflict—persons competing for consumptive or non-consumptive uses of a finite resource—has long occurred in GMU 23, and it has increased in recent years due to increased presence of nonlocal hunters brought in by transporters.[14] The upper Kobuk River is emblematic of the majestic Alaska outdoors. Numerous national parks and preserves, trophy-sized sheefish, and abundant wildlife attract nonlocal hunters, sport fishers, and outdoor recreationalists. Key respondents discussed both directly experienced and perceived conflicts between themselves and nonlocal resource users.

Key respondents discussed 2 consequences of nonlocal activity: that increased traffic displaces wildlife away from subsistence use areas, and that nonlocal users directly compete with local users in traditional subsistence use areas. Most comments concerned aircraft traffic in the upper Kobuk River, the only method of access for nonlocal users. For example, one respondent said, "Well, there are folks that come in with planes. Especially you know upriver. They … I don't know. There are some issues about the planes flying too low upriver and scaring game away" (OBU01020913). According to another respondent:

> They do anyways, they fly in, charter in and out. That's always a real problem for us when we're camping. Them coming in with the planes and scaring the caribou or the moose, bears that we are waiting for, you know. We're in camp, we don't make noise unless we go out with a motor or cut wood with a chainsaw. And when they come in with floatplanes and start flying around, they scare them away, and we're there. We pay a lot of money. With the gas, what we get. To go up that way to begin with, you know. And then they come around here with the … big planes and start landing and … It don't help us. (OBU05021013)

Direct conflict was described by 1 respondent as occurring as close to the community as Dahl Creek. "And then they are … we have this huge runway back at Dahl Creek. You know, there are folks that come in and … land back there, camp out, and hunt caribou back here, back there. They are right there where the caribou are, so they hunt around the area back there and … by the time we get back there, they have already gotten the caribou or scared the caribou away" (OBU01020913).

Development

Kobuk lies within the mineral-rich Ambler mining district, and adjacent to the proposed access corridor. The colocation of the community and mineral site forces residents to balance considerations regarding the future. Respondents perceived both positive and negative consequences of development. Opinions varied among respondents, and some were unsure of their stance toward the issue. "Some people are happy that they are employed, you know, we need the jobs, we need employment, we need them here. And then there is a few people that are kind of in-between" (OBU01020913).

Most concerns were in regards to the proposed access road. Respondents' perception was that it would facilitate access to the upper Kobuk River area for nonlocal hunters. "And my concern is if we were to have a road, you know connected to the villages, it's gonna impact our little lifestyle here" (OBU02021013).

14. James S. Magdanz, editor, *A history of human–land relationships on the upper Kobuk River*, Alaska Department of Fish and Game Division of Subsistence, unpublished data, 2007. The manuscript of this work is on file with ADF&G Division of Subsistence, 1300 College Rd., Fairbanks, AK 99701.

> That's where they're gonna be. The way things look, there will be people from Lower 48 coming up to go with their cars up here and there won't be no more animals. How we gonna live? All of those will be full of people. Even fall time from Fairbanks they come over and they'll be, when you get up to um, Mauneluk even, that's from there on, people float planes, those small planes they land on the sand bar and use fishing, hunting. It gonna get worse, people gonna be hurting. (OBU02021013)
>
> I don't know—for a long time we fight that. But now I think it's gonna happen … I just hope it's not a big problem for our villages …. There'd be more—more alcohol, and drugs and …. If there's roads—and our kids have … wheels, they'd be out there. We wouldn't know where they are. … Just more worries for us around here. (OBU04020813)

Key respondents relied on present experiences with mineral exploration sites to evaluate what consequences would occur under full developmental activities. In 2012, Nova Copper, Inc. was operating seasonal exploratory drilling at the Bornite deposit in the Cosmos Hills and the Ambler schist belt running east-to-west along the southern Brooks Range. One respondent expressed concern with noise associated with mining activity. "They have all the drills back there and 1 year we noticed, a couple of years ago, that the drilling, the noise that they made back there you know because the caribou come, we hunt caribou back here, you know, a lot" (OBU01020913).

Cost of Commodities

Typically a function of distance and transportation costs, commodity prices in rural Alaska communities are higher than those in urban areas. Kobuk is especially challenged as the furthest community along the upper Kobuk River. Greater reliability of air transport dictates that all commodities are flown in to the community rather than the cheaper option of barging them from Kotzebue. Changing river conditions have precluded regular barge traffic from reaching Kobuk for some years. The resulting high prices of food and gas prompted key respondents to discuss the effect of high prices on the subsistence economy.

Some respondents described the dichotomy between store-bought and subsistence foods. "Um … they depended more on subsistence food back then, because it [store-bought] was not available for, you know for us here. And then you know it's available now, but the prices are really high so you have to compensate with subsistence food, you know, for that too" (OBU05021013). One respondent noted that traditional foods offset the cost of commercially available groceries. Subsistence foods are preferred, among other reasons, when groceries are prohibitively expensive for a resident's budget or when groceries are outright unavailable. "Like my aunt is always telling me that some days for some reason or another the planes are going to stop coming and … she is always telling me you know, be prepared for that. You gotta learn how to take care of your fish, learn how to harvest your fish because some day you are gonna need, you will need to know how. You know. The [commercial] food is not gonna be here forever" (OBU01020913). However, the relationship goes both ways, and buying more commercial food was the most common adaptive strategy to acquiring less subsistence resources (Table D4-16).

Survey respondents described reasons that they did not get enough resources (see Harvest Assessments, above), and the price of gas was 1 such reason. Though not as disruptive to the subsistence economy in 2012 as abnormal weather, the increased cost of gas is a primary reason for changes in subsistence use patterns and was a salient topic during the key respondent interviews. Regarding the cost of gas, 1 respondent said, "Well, it kind of limits … you have to, it kind of limits, you know, you going out and … you know, hunting or berry picking, you know, to some degree. And for the folks that, you know, don't have steady income that's even … worse" (OBU01020913). According to the respondent, high cost reduces the amount of effort that can be expended. It also changes the areas that respondents can consistently use, "So that would pretty much cut them off from going upriver to go hunting a lot, he used to pay 4 dollars for 5 gallons back then and 50 bucks [now], that's a big difference there" (OBU02021013).

Erosion

Riverbank erosion was discussed, mostly in passing, as a subset of climate change. Erosion, as 1 respondent described it, occurs as a consequence of high water and fast currents. In years when there are significant water events, the river profile changes in kind. Boaters rely on past experiences navigating the upper Kobuk River to create a mental map of navigable channels, good fishing spots, and landing areas. Erosion can negate this experiential knowledge and presents a chronic challenge to navigating the Kobuk River and utilizing its resources.

Respondents provided examples of how this changes their resource use. "Yeah …. It must be the erosion, you know, in certain areas that, that kind of change the edges all over the place. So there are certain places that we don't seine anymore because of that" (OBU05021013).

> Yeah. That's another thing too you know, the change on the sand bar for masru [Eskimo potato]. It has changed so much you know along the river … It's … well, first of all you, I mean, there are few little areas that we, you know, go around here, around this area, close to Kobuk. You know we try and hit these little spots here and there but, it seems like … the … all those gravel bars have changed also. It's not as easy to get masru anymore. (OBU05021013)

5. DISCUSSION AND CONCLUSIONS

Nicole M. Braem

This chapter will compare subsistence harvest and use patterns among the 3 study communities and place them within a regional context. Although this project collected additional contextual information on a variety of related topics[1], this discussion will pay particular attention to harvest and use patterns, common community concerns, and identified data gaps.

Regional and Long-Term Harvests

Since 1980, most subsistence harvest monitoring efforts in northwest Alaska have used standardized methods that provided comparable estimates. In northwest Alaska, at least 1 community has been surveyed every year since 1991, except in 2005. As of this writing, 17 surveys were comprehensive, 4 limited their foci to major subsistence species, and more than 90 others focused on 1 species group (e.g., salmon, large land mammals, or birds).

These studies do not produce an estimate of total subsistence harvests on an annual basis, but they do provide an increasingly complete assessment of subsistence harvests and patterns of use. Every community in the region has had a comprehensive survey and a large land mammal survey at least once, and some communities have been surveyed multiple times. Annual fish harvest estimates for the years 1994–2004 exist for 6 communities. Ongoing research projects funded by the U.S. Fish and Wildlife Service (USFWS) Coastal Impact Assistance Program, Office of Subsistence Management, and Alaska Department of Fish and Game will continue to add comprehensive fish harvest information to this dataset.

Figure 5-1 shows total harvests, by edible weight[2], from 15 comprehensive surveys conducted in the smaller communities in the region between 1982 and 2012[3], including those in this study. Unfortunately, only

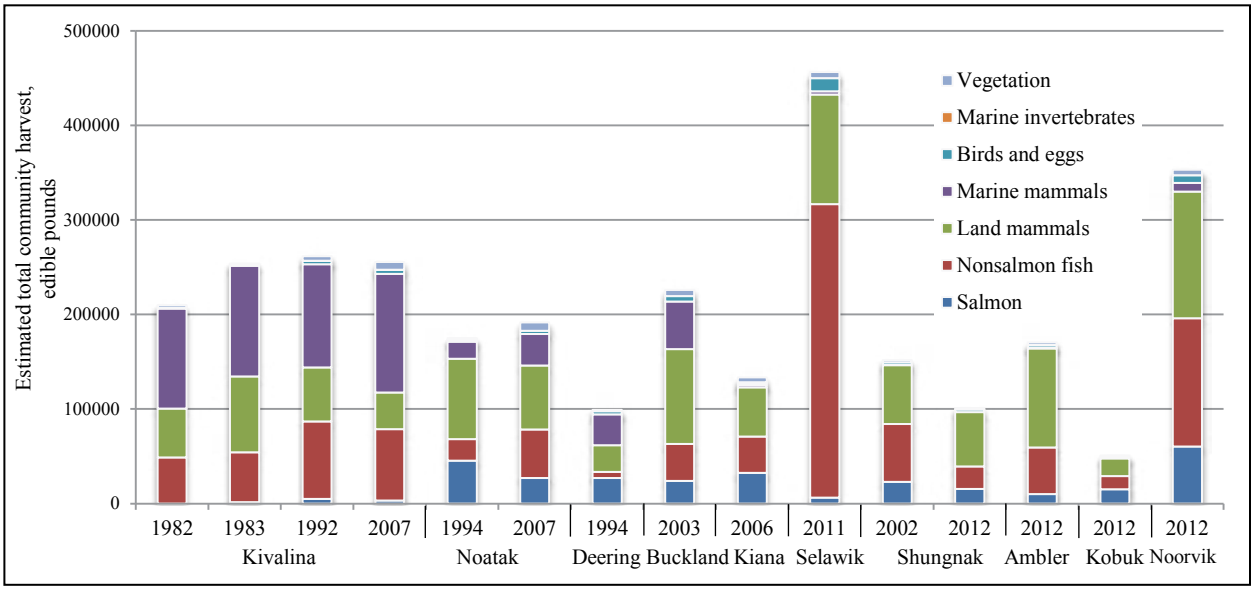

Figure 5-1.–Estimated total community harvest in edible pounds, 15 northwest Alaska communities, 1982–2012.

1. E.g, income, wild food harvesting and processing networks, and food security.

2. Although conversion factors have generally been consistent over multiple studies, they have differed slightly in some cases, as noted in the Shungnak chapter.

3. Kotzebue harvests are excluded from the time series because the patterns of use in regional hubs differ from those of rural communities; Kotzebue harvests are detailed in a similar fashion in Braem et al. 2013.

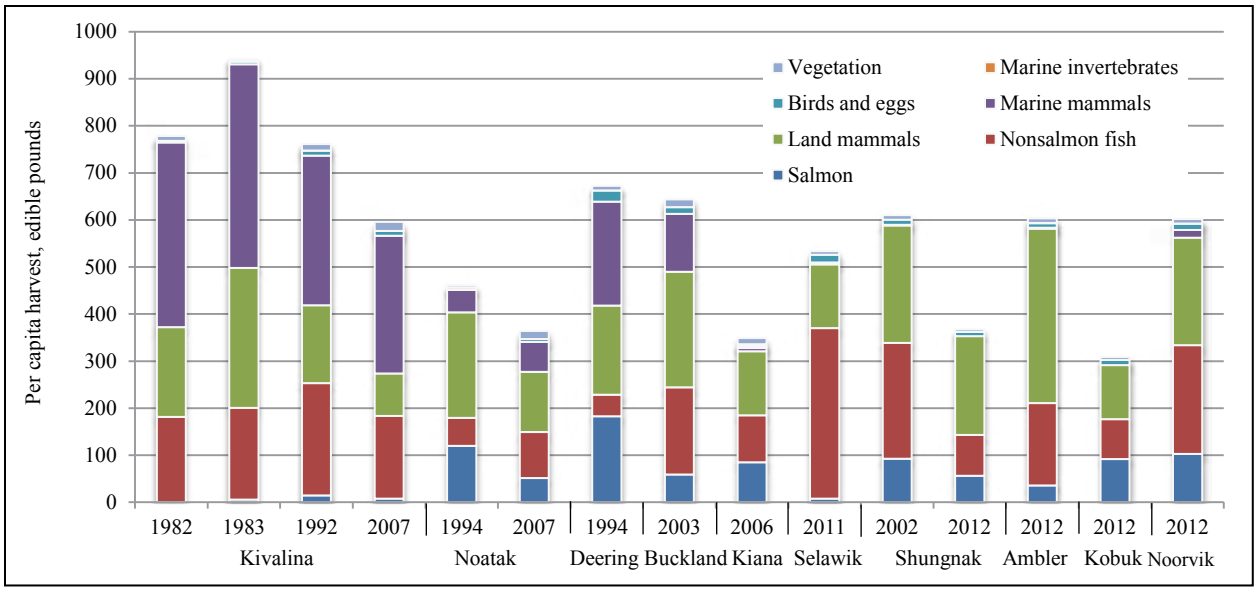

Figure 5-2.–Estimated per capita harvest in edible pounds, 15 northwest Alaska communities, 1982–2012.

Kivalina and Noatak had a comprehensive survey completed before 2000, and only 1 data point exists for 7 communities. Ambler and Kobuk are among those communities with only 1 survey.

The harvest and use of marine mammals is the primary difference between coastal and inland communities, such as those on the upper Kobuk River. The substantial marine mammal harvests of coastal communities are largely absent in inland Kobuk River communities. Every community's overall harvests include large land mammals, primarily caribou, but caribou provide a greater percentage of total harvest in the inland communities. The magnitude of total harvests follows community size: the highest total harvests were recently documented in the 2 largest communities, Selawik and Noorvik.

In order to control for population size, Figure 5-2 shows harvest history on a pounds per capita basis.[4] From this perspective, the highest documented harvests occurred at Kivalina in the early 1980s and in 1992. Kivalina is the region's only community that has active bowhead whaling crews, and the community harvested a bowhead whale in both 1983 and 1992. Because Kivalina was the only community surveyed in the region in the 1980s and because of the singularity of the bowhead harvest, a clearer comparison would consider only harvest surveys completed after 1990, excluding Kivalina's 1992 estimate of 762 lb per capita. Using this approach, pounds per capita harvests have ranged from a high of 672 lb per capita in Deering in 1994 to a low of 309 lb per capita in Kobuk in 2012.[5] Over this time period, residents of the small communities in the NANA region harvested an average of 502 lb of wild foods per capita.[6]

Figure 5-3 shows the 10 species that have contributed the most subsistence food by edible weight over the period 1980–2012.[7] These 10 species constituted 90% of total harvests over time. The inclusion of 3 more resources—ringed seals, northern pike, and berries—would account for 95% of the total harvest. The diversity in harvest composition contributes to residents' abilities to adapt to declines of a single species.

4. Although conversion factors have generally been consistent over multiple studies, they have differed slightly in some cases, as noted in the Shungnak chapter.

5. Kobuk's harvests in 2012, as described earlier, were influenced by extreme weather events. Whether these events are anomalous or part of a larger trend or a "new normal" remains to be seen.

6. Including Kivalina's 1992 harvest in this calculation would result in a value of 516 lb.

7. This figure is calculated using comparable comprehensive survey estimates from Division of Subsistence surveys and 4 studies that limited their studies to major species. Whitefishes other than sheefish were combined, as were berry species, various wild plants, grouse, ptarmigan, and several other species of birds.

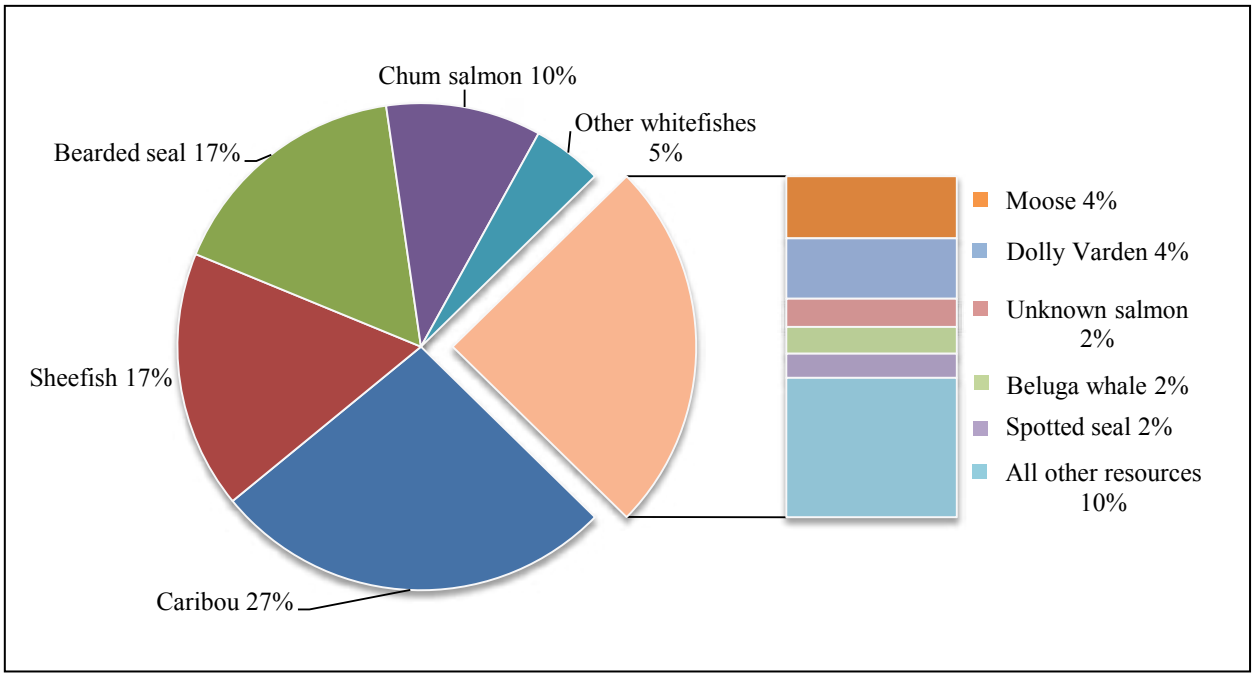

Figure 5-3.–Top ten resources in edible pounds, 15 northwest Alaska communities, 1982–2012.

Five of the top species are fish: sheefish are the largest contributor from this category, followed by chum salmon and Dolly Varden. Because early surveys did not always ask about salmon by species, the actual percentage of harvest that was chum salmon may be slightly higher than the graph indicates. Chum salmon and pink salmon are the only salmon species in real abundance in the region, so the bulk of "unknown salmon" that appear on the chart are likely chum salmon.

The presence of bearded seals, beluga whales, and spotted seals in the top 10 demonstrates the importance of marine mammals to the region. Bowhead whales figure less prominently in northwest Alaska harvests than they do in the North Slope or Bering Strait regions.

Caribou were the single largest contributor to subsistence harvests in the region: they composed 27% of harvests by edible weight between 1980 and 2012. A dramatic decline in the caribou population or any significant disruption of local hunting patterns would have significant impacts on the subsistence diet in northwest Alaska. Although moose are not as commonly used or harvested as caribou, they were also 1 of the top 10 resources. Moose contributed 4% to the total harvest by weight.

Overview of Findings for the Study Communities, 2012

Patterns of Harvest and Use

In total, Ambler, Kobuk, and Shungnak used approximately 2,500 square miles for subsistence hunting, fishing, and gathering during the study period (Figure 5-4). This area is much smaller than that documented in Schroeder et al. 1987. However, this study documented only a single year of use, rather than lifetime use areas. The lack of updated subsistence use area information of sufficient time depth for the 3 study communities is a significant data gap. In reviewing the draft version of this report, one Ambler resident commented that the headwaters of the Ambler River have been an important hunting and fishing area for all 3 upper Kobuk villages since time immemorial. Another tribal member expressed concern about how development might disrupt hunting, fishing, and camping in the area, which is where her parents' Native allotment land is located.

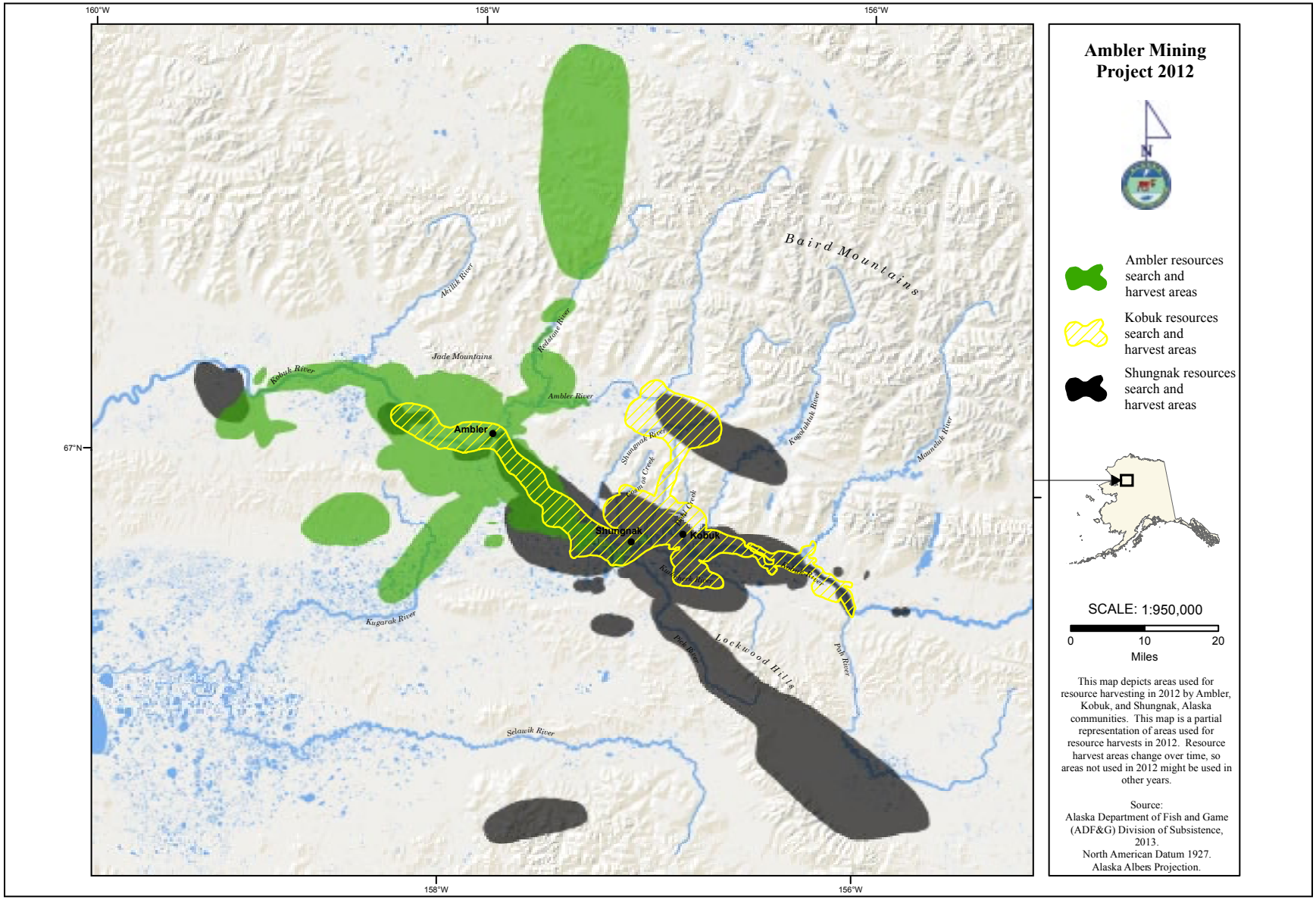

Figure 5-4.–All resources search and harvest areas, Ambler, Shungnak, and Kobuk, 2012.

The 3 communities in this study share a cultural and familial background, geography, and environment. Their documented patterns of harvest and use of fish and wildlife are remarkably similar. However, differences in their 2012 harvests point to each community's unique geographic surroundings and resultant harvest patterning. Although Shungnak and Ambler had nearly the same estimated population in 2012 (275 and 283, respectively), their total harvests were quite different (Table D1-1). On a pounds per capita basis, Ambler harvested nearly twice as much subsistence food (603 lb) as Shungnak (368 lb). Kobuk is much smaller than the other 2 communities (164 people); its estimated harvest was also about one-half that of Ambler, and its per capita harvest was 309 lb.

The primary differences in harvests come from the categories of land mammals and nonsalmon fishes; as noted throughout this report, these categories are largely composed of caribou and various whitefishes. Ambler harvested 330 lb of caribou per capita, compared to 196 lb in Shungnak and 98 lb in Kobuk (Table 2-4; Table 3-4; Table 4-4). The differences are more profound with regard to whitefishes: Ambler harvested 3 times as much as the other 2 communities (161 lb per capita vs. 83 lb and 80 lb) (Table 2-3; Table 3-3; Table 4-3). Sheefish harvests were similar; in fact, Ambler harvested fewer pounds per capita of that species than did Shungnak or Kobuk. Harvests of broad whitefish show the greatest difference between the 3 communities. Ambler harvested 104 lb of broad whitefish per capita, compared to 10 lb in Shungnak and 6 lb in Kobuk.

Ambler's location may have been the deciding factor in the differences observed in caribou and whitefish harvests among the 3 study communities. Ambler is closest to Onion Portage, a major caribou migratory corridor. In key respondent interviews and comments received during Shungnak and Kobuk surveys, residents described several factors which may have influenced their 2012–2013 caribou harvests, including a delayed fall migration that largely passed near Ambler, diversion from migratory paths by wolves, and diversion from migratory paths by noise from NovaCopper's activities (Table D2-16; Table D3-15; Table D4-16). Caribou migrated later than usual, as described in the Shungnak chapter, and when they did finally pass through the area, they moved through quickly. Upper Kobuk residents largely agreed that local predator populations are high. In 2013, during community approval meetings in all 3 communities, residents spoke about wolves being sighted near or in town that winter.[8] One very active Ambler hunter said there were 4 large packs near Ambler: at least 1 based out of the sand dunes and several around Onion Portage. Additionally, several Kobuk residents suggested that road traffic and drilling near the community were frightening caribou.

In addition to its proximity to Onion Portage, Ambler had a very productive fishing location close to town for several fishing gear types, including under-ice nets. Rain and extremely high water affected the community much as it did Shungnak and Kobuk by disrupting the use of set gillnets and seining activity. However, fishers were able to set under-ice nets in the fall and harvest large numbers of broad whitefish. Use of under-ice nets is less common in Shungnak and not feasible in Kobuk; as reported in the Shungnak chapter, none of the 4 families that usually set nets under ice did so in 2012.

Unfortunately, the baseline data collected in this study come from an anomalous year. Shungnak and Kobuk's per capita harvests are the 2 lowest ever documented in the region, and they are likely not representative of each community's use patterns. Kobuk survey respondents indicated the same difficulty in 2 comments:

> This was a bad year to do this project because of low harvest. (Table D4-16)
>
> My concern is that this data be compared with a normal year because this year was too wet, too much rain. (The) river was high. (The) cost of heating oil and gas is (too) high. Hard to do subsistence. (Table D4-16)

8. In Kobuk on January 9, 2013, members of the traditional council noted that they had seen a great number of wolves, and some had been present near and in the community that winter. At a January 24, 2013 ADF&G Upper Kobuk Advisory Committee meeting in Ambler, residents described how cow moose with calves were "congregating" near and in town. It was their belief that they were being driven into town by wolves, and were trying to gain some protection from predators. They also described seeing wolf tracks very close to town. At a meeting of the Shungnak traditional council on January 25, 2013, members of the council also remarked upon the presence of wolves and bears near town.

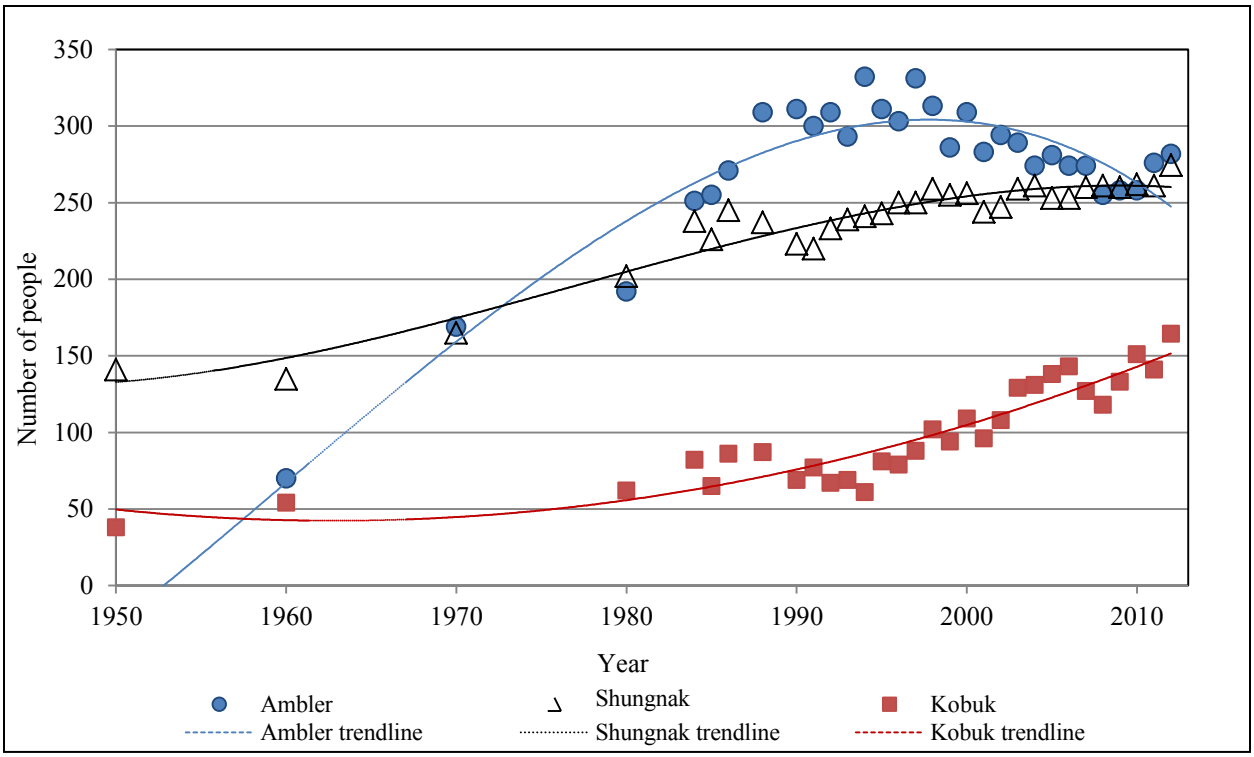

Figure 5-5.–Population history, Ambler, Shungnak, and Kobuk, 1950–2012.

Population Estimates and Demographic Information

Figure 5-5 shows the population history of Ambler, Shungnak, and Kobuk since 1960. Ambler experienced rapid growth between 1960 and 1990 and has since declined gradually. Shungnak's population grew less rapidly than Ambler's, but has since surpassed it. Kobuk's population did not increase greatly until the 1990s. In all 3 communities, the vast majority of residents were Alaska Native (Table D1-1). Ambler had the smallest average household size (4 people) and the highest average age (32) of the 3 (Table 1-2). It also had a slightly higher percentage of female residents (51%) than Kobuk (48%) and Shungnak (49%).

It is beyond the scope of this study to explain the differing population trends among the 3 communities. Huskey (2009), Berman (2009), and Howe (2009) explore migration patterns in northern Alaska by offering explanations of how and why people choose to remain in or move from small rural communities. Moves away from small communities are often temporary; they occur between small communities as well as from small communities to regional and urban centers. Huskey explored 5 possible explanations for migration and noted that people often move in order to improve quality of life: "Quality of life is influenced by social goods as well as by public and environmental goods. In the North, being close to family, friends, and culture have been identified as important determinants of migration" (Huskey 2009:27).

Income and Cash Employment

The percentage of income that came from wage earnings was similar in all 3 communities (Table D1-1). However, median household and per capita income were highest in Ambler, with median household income from all sources of $52,757 and per capita income of $17,018 (Table D2-2, D1-1). In comparison, median household income in Shungnak was $50,091; in Kobuk it was $41,878 (Table D3-2; Table D4-2). A higher percentage of adults in Ambler worked year-round (41%) compared to Shungnak (37%) and Kobuk (35%) (Table D2-3; Table D3-3; Table D4-4).

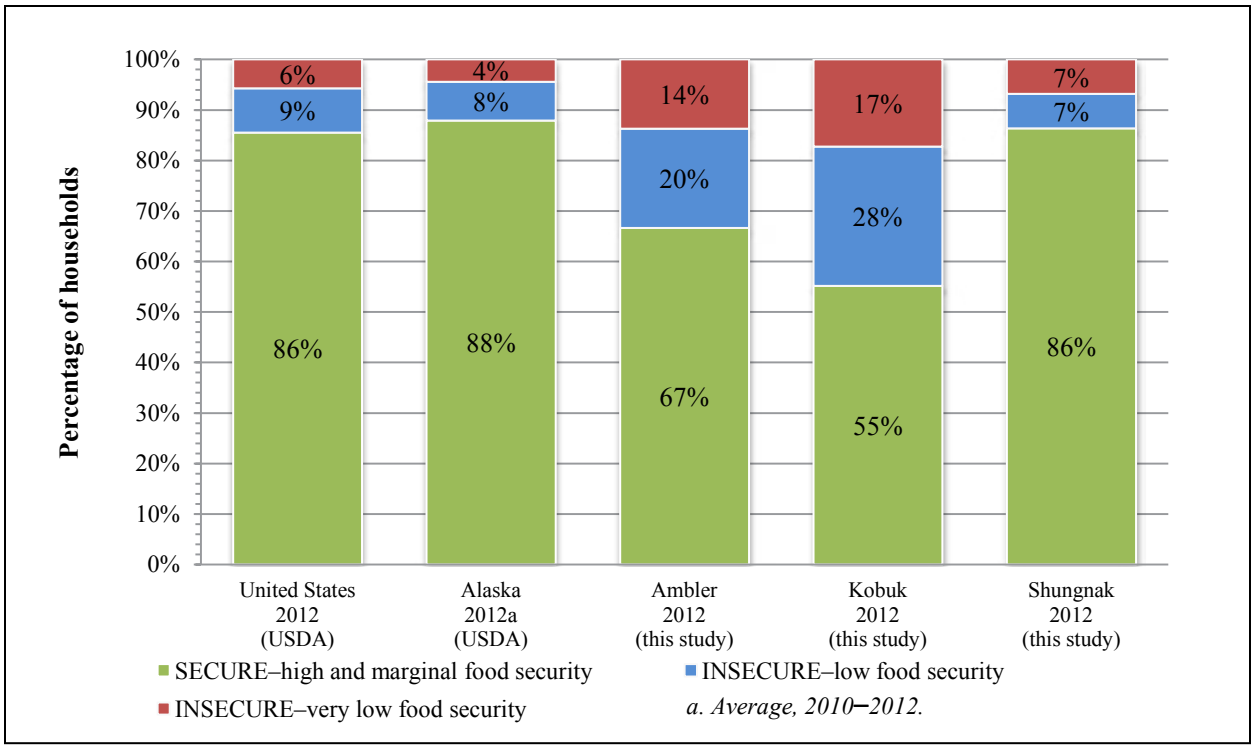

Figure 5-6.–Food security categories, Ambler, Shungnak, and Kobuk, 2012.

Food Security

Figure 5-6 shows the food security scores for all 3 study communities, the United States overall, and Alaska. The results to some degree confound other findings: Ambler had the highest per capita income, median household income, and pounds per capita subsistence harvests, yet Ambler households were less food secure than those in neighboring Shungnak. Despite a poor harvest year, Shungnak households were as food secure as the rest of the country and Alaska. The percentage of households with very low food security in Ambler was double that of Shungnak. Kobuk households had the hardest year overall, with significantly fewer food secure households (55%) and many more low and very low food secure households (45%) than the other 2 communities. The robustness of, or lack of, social networks in each community might explain these contradictory measures.

Wild Food Networks

This study gathered social network information in each community, albeit on a limited scale.[9] Results suggest that Shungnak households were more closely linked to each other and other communities than either Ambler or Kobuk households (Figure 2-22; Figure 3-22; Figure 4-22). For example, Shungnak households were tied to an average of 5.3 other households or communities. Both Ambler (an average of 4.8 ties) and Kobuk (3.7) had fewer ties than Shungnak. Kobuk, the smallest community of the 3, had fewer potential sources. Instances of sharing display even greater differences than sources. Shungnak households reported an average of 15.2 instances where sharing of subsistence goods or services took place. Ambler had 8.8; Kobuk had 8.2.

9. This study limited the types of social capital, or goods and services, to the harvesting and processing of select wild resources. Additional forms of capital include knowledge, cash, hunting or fishing gear, supplies, transportation, and other types of support. Also, this study asked about instances of receiving goods (subsistence foods) but not their magnitude (pounds). Some studies in the past have gone into this detail, but such surveys are extremely long and tiring for respondents.

Local Comments and Concerns

Common topics and themes emerged in comments received from residents of the study communities as documented in the survey, key respondent interviews, and Division of Subsistence staff field notes. These themes were not systematically addressed in the survey, nor were they its focus. However, they lend valuable context to the subsistence harvest and use information and may provide direction for impact assessment efforts and future study.

Climate and Environmental Change

Residents in all study communities remarked upon the abnormal weather events of 2012, as well as long-term patterns of change. Although 2012 was an extreme example, community members have generally observed an increase in rain events in summer and fall. Fall caribou migrations are also occurring later, so bull caribou are often near or in rut by the time they reach hunting areas. Freeze-up is also coming later. In tandem, these patterns have profound implications for the subsistence activities of area residents. Increasingly, rain events not only affect peoples' abilities to harvest fish, but also interfere with processing and preserving them. Late onset of fall and winter also interferes with preserving wild foods. In the past, temperatures cooled enough that caribou harvested in the fall could be dried or hung to age and freeze in outdoor storage, but this is not always possible now. Late freeze-up also interferes with activities reliant on ice such as setting under-ice nets and traps—adaptations which permitted households to compensate for harvest shortfalls earlier in the year.

> We basically hunted from the end of September through October and could preserve the meat at that time because it was cold enough… Drying, or yes, putting it aside freezing, and by the end of October you could just let them hang, no problem. They were perfectly aged and frozen by the end of October. And, um, now that's no longer possible. (ABL02020713)

In fact, in the year following this study, the region experienced several freeze–thaw events during the winter. Many households lost fish and meat in outdoor storage, Ambler residents had a much poorer season with under-ice nets, and Kobuk residents were unable to set fish traps.[10]

Respondents from each community also commented on the effects of erosion. They described encroachment on community sites, changes to river travel, and negative effects on subsistence sites all due to erosion. And in fact, the U.S. General Accounting Office (GAO) included Ambler, Kobuk, and Shungnak in a list of Alaska Native villages affected by erosion (US GAO 2003).

These observations are consistent with those documented in other studies in northern Alaska (Gregory et al. 2006; Hinzman et al. 2005; Huntington and Fox 2005; Huntington et al. 2007; Kruse 2011; McBeath and Shepro 2007; McNeeley and Shulski 2011; Moerlein and Carothers 2012). In addition, area residents are posting climate information to the Alaska Native Tribal Health Consortium's Local Environmental Observer Network.[11]

Cost of Commodities

Residents of all 3 communities expressed their concerns about the high cost of living. No cost of living information or food cost survey has been collected in the 3 communities to date. The most appropriate

10. Unpublished data from Division of Subsistence field notes and interviews conducted in 2014 as part of the Northwest Alaska Key Subsistence Fisheries Harvest Monitoring Program, Project 12-153, funded by the Office of Subsistence Management, U.S. Fish and Wildlife Service. The 4-year project's goals include estimating the annual harvest and use patterns of salmon, char, whitefish, and other key nonsalmon species of fish; understanding the factors influencing the harvest and use of fish; conducting network analysis of harvest, processing, and distribution of subsistence caught fish; and documenting traditional and local knowledge about key species. Data from the project is on file with ADF&G Division of Subsistence, 1300 College Road, Fairbanks, AK 99701.

11. Alaska Native Tribal Health Consortium, Anchorage, n.d. "Local Environmental Observer (LEO) Network." Accessed August 14, 2014. http://www.anthc.org/chs/ces/climate/leo/

proxy in this case is Selawik. In the third quarter of 2011, the University of Alaska Cooperative Extension Service estimated that, in Selawik, the cost of feeding a family of 4, including 2 school-aged children, was 253% the cost of Anchorage.[12] Costs are likely even higher in the upper Kobuk region because most goods arrive by air. The bypass mail system offsets these costs to some degree by transporting freight as mail. However, bypass mail does not cover the costs of all goods coming into the community, nor does it apply to fuel oil and gasoline, prices for which are among the costliest in the state of Alaska.

The high price of gasoline—and in Ambler's case, its unavailability—is impacting subsistence harvest and use patterns. Excessive cost is limiting travel for subsistence pursuits, including the number of trips, their distance, and their frequency. Households that depend on subsistence foods to offset the high prices of store-bought foods must spend more to fish, hunt, and gather traditional foods. In response to high gas prices, some households pool money to buy gas and then travel together in boats, or they forgo distant trips.

Several survey respondents cited the high cost of living as a reason for supporting the proposed road to the Ambler Mining District and mineral development:

> I think the road and mine are a good thing for people, we need more supplies and cheaper gas. (Table D3-15)
>
> Concerned that the road will have a negative impact on subsistence, but will hopefully provide jobs and an incentive for job skills development in Ambler, and an incentive for students to stay in school and graduate from high school. (Table D2-16)
>
> Supports roads, but is concerned about effects on caribou migration. (Table D2-16)
>
> It's good to have a road but it will affect hunting. Prices might drop, benefit. Some concern about what might happen if the road opens. More people hunting. Don't want to see hunting affected by increased access. (Table D2-16)

Impacts from Development and Roads

In all 3 communities, residents expressed mixed opinions on the proposed road and mining activity. Some supported these projects because of the possibility of income from jobs associated with development, while others saw the potential impacts to subsistence as too great. Chief among their concerns were consequences of increased access to nonlocal hunters and the impact of roads and noise on caribou.[13]

In northwest Alaska, user conflict particularly occurs in regard to caribou hunting, but also to a lesser degree to moose hunting and sport fishing for sheefish. As described in the individual community chapters, user conflict increased beginning in the 1990s, and its occurrence varies year to year and community to community.

User conflict in Game Management Unit 23 originates in the current liberal bag limits there combined with increased hunting pressure and restrictions on hunts elsewhere. Indeed, these circumstances attracted nonlocal hunters to the area in the first place. To date, the supply of harvestable animals still meets the demand of both local and nonlocal hunters. The roots of the conflict are varied, but they involve displacement of local hunters from traditional hunting sites, hunt disruption (largely by aircraft traffic), and differences in hunting practices and culture.

In a study of the issue on the Noatak River, local hunters reported waiting for caribou to cross the river, only to watch low-flying aircraft frighten caribou away from the river crossing (Georgette and Loon 1988).

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12. University of Alaska, Fairbanks, Cooperative Extension, Fairbanks, 2011. "Cooperative Extensive Service Food Cost Survey September 2011." Accessed February 6, 2012. http://www.uaf.edu/files/ces/fcs/2011q3data.pdf

13. Recently, researchers modeled the potential effects of proposed roads to the Ambler Mining District on caribou winter habitat based on behavioral avoidance. Their analysis found that 1.5% to 8.5% of high value winter habitat might be reduced in quality, but acknowledged the uncertainty that exists regarding disturbance distances (Wilson et al. 2014). The authors cautioned that other impacts must be considered, such the energetic consequences of responding to traffic, displacement to areas with higher energetic costs, and the consequences of increased access on sport and subsistence hunting.

Nearly all Noatak hunters that were interviewed reported having had more than 1 experience in then-recent years with airplanes disrupting their caribou hunting. Many households said they moved their camps after airplanes flew low or landed near them because caribou would not come down to the river soon after they were frightened by an airplane. Some interviewed hunters said that they had become so frustrated that they were tempted to shoot at offending airplanes (Georgette and Loon 1988:35). However, most did not mind the presence of nonlocal hunters other than the disturbances to their hunting or wasted meat.

Similar problems surfaced in the upper Kobuk River area in the mid-1990s. Nonlocal use of the traditional hunting areas of the 3 upper Kobuk communities (Ambler, Shungnak, and Kobuk) increased around 1980 and intensified in the mid-1990s. In addition to disrupting local caribou hunters, concentrated aircraft activity displaced families from valued fall fish camp sites. A proposal to create a controlled use area on the upper Kobuk failed at a Board of Game meeting in 2002.[14]

The concept of killing an animal just for its antlers, which was often called "sport hunting" by respondents, violates the very strong Inupiat cultural proscription against the wasting of fish or animals. Inupiat people also strongly believe that hunters must let the lead caribou in the migration pass unhindered. The lead caribou, usually females with calves, set the routes that other groups will follow. If the lead caribou are disturbed, the herd will scatter. Despite the omnipresence of cellphones today, virtually every home in northwest Alaska still has a VHF radio, which serves as a "party line." Using a VHF radio, community leaders will admonish young hunters to let the lead caribou pass as they near the village in the fall. Local hunters commonly complained that nonlocal hunters unknowingly camp or use ATVs in key migration corridors, deflecting caribou.

Various agencies have attempted to mitigate this conflict. Their attempts have included educating visiting hunters on proper meat care, providing an orientation course for transporters to reduce disruptions and displacement, and creating the GMU 23 Working Group[15] to involve all stakeholders in an effort to mitigate the conflict. These attempts have met with varying success. Agency staff working in these communities continued to hear about disrupted hunts, wasted meat, and deflection of caribou migrations. Furthermore, community members perceived that state and federal managers have been reluctant to solve the problem over the last 30 years; this perception created resentment and distrust of resource managers in the region. Local hunters had a very low tolerance for aircraft-supported hunters, whom they called "Cabela's cowboys." Community members were particularly offended by anecdotes of visiting hunters salvaging as required in the field only to leave meat in Kotzebue dumpsters. Rather than pay to take the meat home, these hunters merely carried out the antlers.

Concerns over increased disruptions to fall caribou hunting and the effects of increased numbers of hunters on game populations and management are not misplaced. Only a few case studies exist. In a study of community subsistence productivity, Wolfe and Walker (1987) found that distance from urban centers, the presence of roads, degree of settlement entry, and community income were key factors:

> Roads have increased competition for wild resources between rural and urban residents. Urban-based hunters and fishers utilize roads for access to rural areas for fishing and hunting, directly competing with rural communities and lowering their subsistence harvests. As an example of the level of competition, of 3097 moose hunters counted

14. James S. Magdanz, editor, A history of human–land relationships on the upper Kobuk River, Alaska Department of Fish and Game Division of Subsistence, unpublished data, 2007. The manuscript of this work is on file with the ADF&G Division of Subsistence, 1300 College Rd. Fairbanks, AK 99701.

15. The Alaska Department of Fish and Game interviewed representatives from different user groups in 2006. ADF&G staff met with key individuals and agencies to discuss convening a working group focused on hunting in GMU 23. Meeting attendees recommended the creation of a working group to cooperatively resolve conflicts. The GMU 23 Working Group was established in 2008. It consists of 20 members who represent regional and tribal governments, land and wildlife management agencies, the Big Game Commercial Services Board, the Alaska Professional Hunters Association, the NANA Corporation, state and federal advisory committees, the Board of Game, and the Federal Subsistence Board. (Alaska Department of Fish and Game, n.d. GMU 23 Working Group. Accessed August 14, 2014. http://www.adfg.alaska.gov/index.cfm?adfg=plans.unit23)

> by the state fish and game department in 1983 in the Copper Basin (a traditional Ahtna region connected by roads to Anchorage since 1927), only 13% were local rural residents of the basin. Of 7540 salmon dip net and fishwheel permits, only 5.3% were held by local rural residents (Fall 1985). The increased competition for wild resources by outsiders has led to more restrictive regulations for fishing and hunting (seasons, bag limits and methods) which have lowered subsistence harvests. (Wolfe and Walker 1987:69)

In "Impacts of Roads and Settlement Entry on Subsistence in Alaska," Wolfe and Walker (1986) recommended that resource managers should use this information to assess management of road use in order to lessen potential negative effects on subsistence systems.[16] "What may appear to be economic development of land and improved land use through roads and land disposals may actually constitute a deterioration of the stable subsistence economy of particular rural communities and areas" (Wolfe and Walker 1986:4).

Communities also expressed concern about resource management strategies changing in response to increased access. The history of the Nelchina caribou herd provides an example of increased access leading to progressively restrictive and complicated hunt regulations (Fall and Simeone 2010). The study concluded, in part, that the Nelchina herd was particularly vulnerable to overharvest because of its accessibility to human population centers.

In 2012, the Western Arctic Caribou Herd (WAH) Working Group[17] drafted a letter to Governor Sean Parnell requesting that the state complete a health impact assessment (HIA) in order to assess potential effects of proposed roads and mineral development on people and communities within the range of the WAH. The group also asked that the state complete the HIA and provide results to potentially affected communities before deciding whether or not to build roads.

The letter in its entirety is included in Appendix E. The governor's response is found in Appendix F.

Conclusions

Subsistence harvests of wild foods make major contributions to the multiple critical facets of well-being of Alaska's rural communities. Previous studies have documented the social, cultural, economic, nutritional, and psychological benefits associated with subsistence activities and foods (Ballew et al. 2004; Fall 2014; Heller and Scott 1967; Johnson et al. 2009; McGrath-Hanna et al. 2003; Nobmann 1997; Poppel et al. 2007; Receveur et al. 1998; Richmond and Ross 2009; Wolfe 2000). In northwest Alaska, the harvesting, processing, and distribution of wild foods structure human relationships and sustain indigenous traditions (Bodenhorn 2000; Burch Jr. 1975; Langdon and Worl 1981; Magdanz et al. 2002; Wolfe et al. 2009). Unfortunately, conventional economic indicators do not measure subsistence's contributions to a local economy (Goldsmith 2007).[18] Assessment of cost-benefit potential associated with specific development

16. Wolfe and Walker 1986 and 1987 were based upon the same data and analysis.

17. The Western Arctic Caribou Herd Working Group is a stakeholder-based, cooperative effort. Its member include representatives from subsistence hunters living in rural villages within the WAH range, other Alaska hunters, conservationists, hunting guides, reindeer herders, and hunter transporters. It is supported by 4 resource management agencies working within the range of the WAH herd, including the Alaska Department of Fish and Game, the U.S. Department of the Interior's Bureau of Land Management, National Park Service, and U.S. Fish and Wildlife Service. Its recently updated cooperative management plan, a set of recommendations for herd management, states: "The purpose of the plan is to work together to ensure the long-term conservation of the Western Arctic caribou herd and the ecosystem on which it depends, to maintain traditional and other uses for the benefit of all people now and in the future." Western Arctic Caribou Herd Working Group. 2011. Western Arctic Caribou Herd Cooperative Management Plan, revised December 2011. Nome, Alaska.

18. "Even with consistency in definitions and improvements in the quality of data collected, the standard indicators would not provide a complete or balanced picture of the complexity of the economy. This is because the subsistence and informal sectors are nowhere captured by indicators which are designed only to measure activity in the cash economy. Because these non-market activities consume a considerable amount of time and effort or rural residents, and contribute significantly to the economic well-being of the region, they should be included for several reasons. Without them the well-being of residents is undervalued, comparison with urban areas are misleading, and economic development strategies are not grounded in reality." (Goldsmith 2007:45)

projects should take into account the ways in which subsistence contributes to the lives of individuals and communities in rural Alaska.

Harvests by residents of northwest Alaska averaged 502 lb per capita between 1990 and 2012—among the highest per capita harvests documented in Alaska. These harvests were slightly larger than arctic Alaska overall, which averaged 438 lb per capita, and substantially larger than harvests in urban areas, such as Anchorage and Fairbanks (17 lb and 20 lb per capita, respectively) (Fall 2014). The poor harvest year in 2012 in Shungnak and Kobuk aside, results from this study clarify the extent to which households in the upper Kobuk region depend upon their customary and traditional harvests of wild foods. Analyzing the subsistence harvest by assigning a replacement value of $8.00 per lb, which may be too low a replacement cost, would value the 2012 harvest year of the 3 study communities at $2.4 million. The scale of harvests alone demonstrates the link in these communities between subsistence and food security.

The results from this study and the comments and concerns expressed by residents of the study communities speak to the resiliency and vulnerabilities of the mixed wage–subsistence economies present in 2012. Upper Kobuk communities have a rich resource base. However, unlike coastal communities, area residents cannot easily shift their harvests to marine mammals to compensate for disrupted harvests of fish or wildlife. Communities are already coping with rapid climate change, high prices for imported foods, and the increasing cost of harvesting subsistence foods. Whitefishes in particular matter a great deal to area residents, as do caribou. Alterations to or contamination of whitefish habitat or disruption of caribou migration could have profound impacts upon local subsistence economies. While the potential for contamination or disruption is beyond the scope of this report, the stakes are sufficiently high as to warrant a robust discussion of risk.

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APPENDIX A–SURVEY INSTRUMENT

COMPREHENSIVE SUBSISTENCE SURVEY

KOBUK, ALASKA

From February 1, 2012 to January 31, 2013

AMBLER MINING DISTRICT

PRINTED 2013-01-31

This survey is used to estimate subsistence harvests and to describe community subsistence economies. We will publish a summary report, and send it to all households in your community. We share this information with the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service and the National Park Service. We work with the Federal Regional Advisory Councils and with local Fish and Game Advisory Committees to better manage subsistence, and to implement federal and state subsistence priorities.

We will NOT identify your household. We will NOT use this information for enforcement. Participation in this survey is voluntary. Even if you agree to be surveyed, you may stop at any time.

HOUSEHOLD ID:		
COMMUNITY ID:	KOBUK	195
INTERVIEWER:		
INTERVIEW DATE:		
START TIME:		
STOP TIME:		
	DATA CODED BY:	
	DATA ENTERED BY:	
	SUPERVISOR:	

COOPERATING ORGANIZATIONS

NATIVE VILLAGE OF KOBUK
BOX 51039
KOBUK, AK 99751

(907) 948-2203

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

907-459-7320

HOUSEHOLD MEMBERS

HOUSEHOLD ID

First, I would like to ask about the people in your household, permanent members of your household who sleep at your house. This includes students who return home every summer. I am NOT interested in people who lived with you temporarily, even if they stayed several months.

Last year, that is, between February 1, 2012, and January 31, 2013, WHO were the head or heads of this household?

Is this person answering questions on this survey?		How is this person related to HEAD 1?	Is this person MALE or FEMALE?	Is this person an ALASKA NATIVE?	How OLD is this person?	Except for school or military service, has this person always lived in Kobuk?	*If person has NOT always lived in Kobuk…*			
							WHEN did they LAST move here?	From WHERE did this person move?	Where is this person's birth home?*	TOTAL years lived here?
								community in Alaska,		
ID#	*circle*	*relation*	*circle*	*circle*	*age*	*circle*	*year*	*OR state in the US, OR country*		*years*
HEAD	Y N		M F	Y N		Y N				
1										
NEXT enter spouse or partner. If household has a SINGLE HEAD, leave HEAD 2 row BLANK, and move to PERSON 3.										
HEAD	Y N		M F	Y N		Y N				
2										
BELOW, enter children (oldest to youngest), grandchildren, grandparents, or anyone else living full-time in this household.										
PERSON 3			M F	Y N		Y N				
3	0									
PERSON 4			M F	Y N		Y N				
4	0									
PERSON 5			M F	Y N		Y N				
5	0									
PERSON 6			M F	Y N		Y N				
6	0									
PERSON 7			M F	Y N		Y N				
7	0									
PERSON 8			M F	Y N		Y N				
8	0									
PERSON 9			M F	Y N		Y N				
9	0									
PERSON 10			M F	Y N		Y N				
10	0									
PERSON 11			M F	Y N		Y N				
11	0									
PERSON 12			M F	Y N		Y N				
12	0									
PERSON 13			M F	Y N		Y N				
13	0									
PERSON 14			M F	Y N		Y N				
14	0									

** "BIRTH HOME" means the place this person's PARENTS WERE LIVING when this person was born.*

PERMANENT HH MEMBERS: 01 **KOBUK: 195**

EMPLOYMENT STATUS

HOUSEHOLD ID

The next few pages ask about jobs, income, expenses, and equipment. We ask about these things because we are trying to understand all parts of the community economy. Many people use wages from jobs to support subsistence activities, and subsistence equipment can be very expensive.

Starting with the first head of your household, what job or jobs did he or she have last year?

INCLUDE EVERY PERSON 16 YEARS AND OLDER ON THIS PAGE, EVEN IF THEY DO NOT HAVE A JOB!

For each member of this household born before 1997, list EACH JOB held last year. For household members who did not have a job, write: RETIRED, UNEMPLOYED, STUDENT, HOMEMAKER, DISABLED, etc. There should be AT LEAST one row for each member of this household born before 1997 (this includes anyone who is 16 years old or older).

			Person Code from page 2	What kind of work did he or she do in this job?	For whom did he or she work in this job?	In the past year, what months did he or she work in this job?	WORK SCHEDULE…** FULL TIME	PART TIME	SHIFT - FULL TIME	ON-CALL, VARIES	SHIFT - PART TIME	In the past year how much did he or she earn in this job?
				*job title**	*employer*	*circle each month worked*	*circle one*					*gross income****
		1ST JOB				J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / Yr
1	6	910100000										
		2ND JOB				J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / Yr
2	6	910100000										
		3RD JOB				J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / Yr
3	6	910100000										
		4TH JOB				J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / Yr
4	6	910100000										
		5TH JOB				J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / Yr
5	6	910100000										
		6TH JOB				J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / Yr
6	6	910100000										
		7TH JOB				J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / Yr
7	6	910100000										
		8TH JOB				J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / Yr
8	6	910100000										
		9TH JOB				J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / Yr
9	6	910100000										
		10TH JOB				J F M A M J J A S O N D	FT	PT	SF	OC	SP	$ / Yr
10	6	910100000										

* If a person FISHES COMMERCIALLY or is otherwise SELF-EMPLOYED, list that as a separate job. For job title, enter COMMERCIAL FISHER, CARVER, SEWER, BAKER, etc. Work schedule usually will be ON CALL. For gross income from self-employment, enter revenue minus expenses.

If a person does not earn money from any kind of work, enter RETIRED, UNEMPLOYED, DISABLED, STUDENT, or HOMEMAKER or other appropriate description as the job title. Leave employer, months worked, schedule, and gross income blank.

** WORK SCHEDULE

FT - Fulltime (35+ hours/week)	1
PT - Parttime (<35 hours/week)	2
SF - Shift (2 wks on/2 off, etc.)	3
OC - On Call, Irregular	4
SP - Shift - part time	5
-- - Unemployed	0

*** GROSS INCOME is the same as TAXABLE INCOME on a W-2 form. Self-employment, enter revenue - expense

EMPLOYMENT: 23 **KOBUK: 195**

OTHER INCOME

THIS PAGE IS ONLY FOR INCOME THAT IS NOT EARNED FROM WORKING — HOUSEHOLD ID

Between FEBRUARY 1, 2012, and JANUARY 31, 2013…
…Did any members of your household receive a dividend from the Permanent Fund or a Native Corporation?..... Y N

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

		Did anyone in your household receive income from _____ in 2012?	TOTAL amount all members of your household received from _____ in 2012.
		circle one	*dollars*
DIVIDENDS	ALASKA PERMANENT FUND DIVIDEND	Y N	$ /YR
	32		
	NATIVE CORPORATION DIVIDENDS	Y N	$ /YR
	13		

Alaska PFD IN 2012
1 PFD = $878
2 PFDs = $1,756
3 PFDs = $2,634
4 PFDs = $3,512
5 PFDs = $4,390
6 PFDs = $5,268
7 PFDs = $6,146
8 PFDs = $7,024
9 PFDs = $7,902
10 PFDs = $8,780
11 PFDs = $9,658
12 PFDs = $10,536

Regional Corporations	*Dividend*
NANA Regional Corp.....	*$ 7.72*
Arctic Slope Regional Corp.....	*$ 50.38*
Bering Strait Native Corporation.....	
Village Corporation(s)	***Dividend***
.....	*$ -*
Elder Dividends	***Dividend***
NANA Regional Corp.....	*$ 2,000.00*
Bering Strait Native Corporation	*$ 500.00*

Between FEBRUARY 1, 2012, and JANUARY 31, 2013…
…Did any members of your household receive OTHER income such as SENIOR BENEFITS or UNEMPLOYMENT?..... Y N

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

		Received? *circle one*	Total Amount? *dollars*
EMPLOYMENT RELATED	UNEMPLOYMENT	Y N	$ /YR
	12		
	WORKERS' COMP	Y N	$ /YR
	8		
	SOCIAL SECURITY	Y N	$ /YR
	7		
	PENSION & RETIREMENT	Y N	$ /YR
	5		
	DISABILITY	Y N	$ /YR
	31		
	VETERANS ASSISTANCE	Y N	$ /YR
	35		
ENTITLEMENTS	FOOD STAMPS	Y N	$ /YR
	11		
	ADULT PUBLIC ASSISTANCE	Y N	$ /YR
	3		
	SUPPLEMENTAL SECURITY INCOME (SSI)	Y N	$ /YR
	10		
STATE BENEFITS	HEATING ASSISTANCE	Y N	$ /YR
	9		
	ALASKA SENIOR BENEFITS (LONGEVITY)	Y N	$ /YR
	6		

		Received? *circle one*	Total Amount? *dollars*
FAMILY & CHILD	TANF *(say"Tanif," used to be AFDC)*	Y N	$ /YR
	2		
	CHILD SUPPORT	Y N	$ /YR
	15		
	FOSTER CARE	Y N	$ /YR
	41		
OTHER	FUEL VOUCHERS (CITGO)	Y N	$ /YR
	MEETING HONORARIA *(not per diem*)*	Y N	$ /YR
	OTHER *(describe)*	Y N	$ /YR
	OTHER *(describe)*	Y N	$ /YR

** per diem covers travel expenses, and is not counted as income.*

Scratch paper for calculations

$ *for _____ weeks =*
for _____ months =

$ *for _____ weeks =*
for _____ months =

Senior benefits of $125 per month for 12 months = $1,500 per elder
Senior benefits of $175 per month for 12 months = $2,100 per elder
Senior benefits of $250 per month for 12 months = $3,000 per elder

OTHER INCOME: 24 — **KOBUK: 195**

RETAINED COMMERCIAL HARVESTS

HOUSEHOLD ID

1. Do you or members of your household USUALLY participate in commercial fisheries?..... Y N

2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013),
did you or members of your household PARTICIPATE in a commercial fishery?..... Y N

IF the answer to QUESTION 2 is NO, go to the subsistence harvests section.

IF the answer is YES, continue on this page…

During the last year,[1]
did you or members of your household….

A …FISH commercially for _____?

B …KEEP any _____ from your commercial catch for your own use[2] or to share?

C Was the _____ that you kept INCIDENTAL[4] catch?

If KEEP is "yes"

Please estimate how many fish ALL MEMBERS OF YOUR HOUSEHOLD removed from commercial harvests for personal use during the last year.

Include COMMERCIALLY HARVESTED fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If helping others, report ONLY THIS HOUSEHOLD'S share.

Read names below in blanks above	*A COM FISH?*	*B KEEP?*	*C INCI?*	How many were removed for your OWN USE?[5]	How many were removed for your CREW?[5]	How many were removed to give to OTHERS?	Units[3]	
				number	*number*	*number*	*specify*	*comments*
CHUM (DOG) SALMON *Qalugruaq, Aqalugruaq*	Y N	Y N	Y N					
111,000,001								
PINK (HUMPY) SALMON *Amaqtuq*	Y N	Y N	Y N					
114,000,001								
COHO (SILVER) SALMON	Y N	Y N	Y N					
112,000,001								
SOCKEYE (RED) SALMON	Y N	Y N	Y N					
115,000,001								
CHINOOK (KING) SALMON *Iqalsugruuk*	Y N	Y N	Y N					
113,000,001								
SHEEFISH *Sii*	Y N	Y N	Y N					
125,600,001								
DOLLY VARDEN (TROUT) *Qalukpik*	Y N	Y N	Y N					
125,006,001								
BROAD WHITEFISH *Qausriłuk*	Y N	Y N	Y N					
126,404,001								
KING CRAB	Y N	Y N	Y N					
501,008,000								
	Y N	Y N	Y N					

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*
4 *"INCIDENTAL CATCH" means the fish kept was not being commercially fished. For example, a king salmon kept from a chum commerical fisher*
5 *Double counting (captains' removals for crew members and crew members' removal for own uses) is fixed in analysis. Collect both.*

COMMERCIALLY HARVESTED RESOURCES: 03 **KOBUK: 195**

SUBSISTENCE HARVESTS: SALMON

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for salmon for subsistence?..... Y N

2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013),
did you or members of your household USE or TRY TO FISH FOR salmon?..... Y N

IF the answer to QUESTION 2 is NO, go to the SALMON summary page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many salmon ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many were caught with...

INCLUDE salmon that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	SET GILL NET	SEINE NET	ROD & REEL	OTHER GEAR (specify type)	Units ***	# OF THOSE used just for dog food?
						number harvested by each gear type			*amount / type*	*specify*	*dogfood*
CHUM (DOG) SALMON *Qalugruaq, Aqalugruaq*	Y N	Y N	Y N	Y N	Y N				/	IND	
111,000,000											
PINK SALMON (HUMPIES) *Amaqtuq*	Y N	Y N	Y N	Y N	Y N				/	IND	
114,000,000											
COHO (SILVER) SALMON	Y N	Y N	Y N	Y N	Y N				/	IND	
112,000,000											
SOCKEYE (RED) SALMON	Y N	Y N	Y N	Y N	Y N				/	IND	
115,000,000											
CHINOOK (KING) SALMON *Iqalsugruuk*	Y N	Y N	Y N	Y N	Y N				/	IND	
113,000,000											
SALMON - UNKNOWN	Y N	Y N	Y N	Y N	Y N				/	IND	
119,000,000											
	Y N	Y N	Y N	Y N	Y N				/		
	Y N	Y N	Y N	Y N	Y N				/		
	Y N	Y N	Y N	Y N	Y N				/		

During the last year, did your household use any other kind of salmon?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *"ROD AND REEL" includes fish caught in open water with a hook and and a line attached to a rod or a pole. Jigging through the ice is "other ge*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

NON-COMMERCIAL SALMON: 04 **KOBUK: 195**

SUBSISTENCE SUMMARY: SALMON

HOUSEHOLD ID

If this household did NOT USE or HARVEST salmon last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING — ***Refer to data collection maps and mapping instructions to map salmon...***

NETWORKS — ***…then ask the network and assessment questions below***

During the last year[1],

…who CAUGHT the SALMON your household used? (Enter most important sources first.) 110,000,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
CAUGHT SALMON 1			

…who PROCESSED the SALMON your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED SALMON 2			

…who else (not yet named) GAVE SALMON to your household? (Enter most important households or communities first.)

role			
GAVE SALMON TO US 3			

ASSESSMENTS: 110,000,000

To conclude our salmon section, I am going to ask a few general questions about salmon.

During the last year[1],

…did your household use LESS, SAME, or MORE salmon than in recent years? ..... X L S M

X = do not use

If LESS or MORE…

WHY was your use different? 1 2

► *(IF HOUSEHOLD "DOES NOT USE" salmon, go to NEXT SECTION otherwise continue below:)*

During the last year[1],

…did your household GET ENOUGH salmon? ..... Y N

If NO…

What KIND of salmon did you need? .....

WHY did your household NOT get enough salmon? 1 2

How would you describe the impact to your household of not getting enough last year? ..... not noticable? (0) minor? (1) major? (2) severe? (3)

Did your household do anything DIFFERENTLY because you did NOT get enough salmon? ..... Y N

IF YES…

What did your household do differently? 1 2

NETWORKS & ASSESSMENTS OF SALMON: 66, 67 **KOBUK: 195**

FACTORS: SALMON

HOUSEHOLD ID

I would like you to think back on your household's salmon fishing in the last twelve months. I am going to ask you about things that affected your fishing. Let's start with the MOST IMPORTANT thing.

What was the SINGLE MOST IMPORTANT THING that affected your household's salmon fishing in the last twelve months?

► *Briefly describe that factor below.*

How did that affect your household?

Did anything else affect your salmon fishing? (Circle one) N Y ?

If **YES**, what was the NEXT MOST IMPORTANT THING that affected your household's salmon fishing in the last twelve months?

► *Briefly describe the factor below.*

How did that affect your household?

Did anything else affect your salmon fishing? (Circle one) N Y ?

If **YES**, what was the NEXT MOST IMPORTANT THING that affected your household's salmon fishing in the last twelve months?

► *Briefly describe that factor below.*

How did that affect your household?

SUBSISTENCE HARVESTS: WHITEFISH

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for whitefish for subsistence?..... Y N

2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013),
did you or members of your household USE or TRY TO FISH FOR whitefish?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many whitefish ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many were

INCLUDE whitefish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	SET GILL NET	SEINE NET	ROD & REEL	OTHER GEAR (specify type)	Units[4]	How many of THOSE were used for dog food?
						number harvested by each gear type			*amount / type*	*specify*	*dogfood*
SHEEFISH *Sii*	Y N	Y N	Y N	Y N	Y N				/	IND	
125,600,000											
BROAD WHITEFISH *Qausriłuk*	Y N	Y N	Y N	Y N	Y N				/	IND	
126,404,000											
HUMPBACK WHITEFISH *Qaalġiq*	Y N	Y N	Y N	Y N	Y N				/	IND	
126,408,000											
ROUND WHITEFISH *Quptik*	Y N	Y N	Y N	Y N	Y N				/	IND	
126,412,000											
BERING CISCO *Tipuk*	Y N	Y N	Y N	Y N	Y N				/	IND	
126,406,040											
LEAST CISCO *Qalusraaq, Iqalusaaq, Qalutchiaq*	Y N	Y N	Y N	Y N	Y N				/	IND	
126,406,060											
UNKNOWN WHITEFISH	Y N	Y N	Y N	Y N	Y N				/	IND	
126,499,000											
	Y N	Y N	Y N	Y N	Y N				/		
	Y N	Y N	Y N	Y N	Y N				/		

During the last year, did your household use any other kind of whitefish?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *"ROD AND REEL" includes fish caught in open water with a hook and and a line attached to a rod or a pole. Jigging through the ice is "other ge*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

NON-SALMON FINFISH: 06 **KOBUK: 195**

HARVESTS: OTHER FISH

HOUSEHOLD ID

1. Do you or members of your household USUALLY fish for other fish for subsistence, such as DOLLY VARDEN (TROUT) , BURBOT (MUDSHARK)), or any other other fish?..... Y N
2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO FISH FOR other fish?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year. How many were

INCLUDE other fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	SET GILL NET	SEINE NET	ROD & REEL	OTHER GEAR (specify type)	Units[4]	How many of THOSE were used for dog food?
						number harvested by each gear type			*amount / type*	*specify*	*dogfood*
DOLLY VARDEN (Trout) *Qalukpik, Aqalukpiq*	Y N	Y N	Y N	Y N	Y N				/	IND	
125,006,000											
NORTHERN PIKE *Siilik*	Y N	Y N	Y N	Y N	Y N				/	IND	
125,500,000											
BURBOT (MUDSHARK) *Tittaaliq*	Y N	Y N	Y N	Y N	Y N				/	IND	
124,800,000											
GRAYLING *Sulupaugaq*	Y N	Y N	Y N	Y N	Y N				/	IND	
125,200,000											
LAKE TROUT *Kanak*	Y N	Y N	Y N	Y N	Y N				/	IND	
125,010,000											
TOMCOD *Uugaq*	Y N	Y N	Y N	Y N	Y N				/	IND	
121,010,000											
SMELT *Ilhauġñiq*	Y N	Y N	Y N	Y N	Y N				/	IND	
120,406,000											
HERRING *Uqsruqtuuq*	Y N	Y N	Y N	Y N	Y N				/	IND	
120,200,000											
	Y N	Y N	Y N	Y N	Y N				/	IND	

During the last year, did your household use any other kind of other fish?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *"ROD AND REEL" includes fish caught in open water with a hook and and a line attached to a rod or a pole. Jigging through the ice is "other ge*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

NON-SALMON FINFISH: 06 **KOBUK: 195**

SUBSISTENCE SUMMARY: FISH OTHER THAN SALMON

HOUSEHOLD ID

If this household did NOT USE or HARVEST fish other than salmon last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping, network, and assessment sections...

MAPPING — ***Refer to data collection maps and mapping instructions to map fish other than salmon...***

NETWORKS — ***…then ask the network and assessment questions below***

During the last year …who CAUGHT the WHITEFISH your household used? (Enter most important sources first.) 126,400,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
CAUGHT WHITEFISH			
1			

During the last year …who PROCESSED the WHITEFISH your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED WHITEFISH			
2			

During the last year …who else (not yet named) GAVE WHITEFISH to your household? (Enter most important sources first.)

GAVE WHITEFISH TO US →			
3			

During the last year …who CAUGHT the OTHER FISH your household used? (Enter most important sources first.) 960,300,500

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
CAUGHT OTHER FISH			
1			

During the last year …who PROCESSED the OTHER FISH your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED OTHER FISH			
2			

During the last year …who else not yet named GAVE OTHER FISH to your household? (Enter most important households or communities first.)

GAVE OTHER FISH TO US →			
3			

ASSESSMENTS: 100,000,002

To conclude our fish other than salmon section, I am going to ask a few general questions about fish other than salmon (Whitefish and other fishes).

During the last year…did your household use LESS, SAME, or MORE fish other than salmon than in recent years?..... X L S M

If LESS or MORE… *X = do not use*

WHY was your use different?..... 1 2

► *(IF HOUSEHOLD "DOES NOT USE" fish other than salmon, go to NEXT SECTION, otherwise continue below:)*

During the last year…did your household GET ENOUGH fish other than salmon?..... Y N

If NO…

What KIND of fish other than salmon did you need?.....

WHY did your household NOT get enough fish other than salmon?..... 1 2

How would you describe the impact to your household of not getting enough last year?..... not noticable? (0) minor? (1) major? (2) severe? (3)

Did your household do anything DIFFERENTLY because you did NOT get enough fish other than salmon?..... Y N

IF YES…

What did your household do differently?..... 1 2

NETWORKS & ASSESSMENTS OF FISH OTHER THAN SALMON: 66, 67 **KOBUK: 195**

FACTORS: FISH OTHER THAN SALMON

HOUSEHOLD ID

I would like you to think back on your household's fishing for FISH OTHER THAN SALMON in the last twelve months. I am going to ask you about things that affected your fishing. Let's start with the MOST IMPORTANT thing.

What was the SINGLE MOST IMPORTANT THING that affected your household's fishing for FISH OTHER THAN SALMON in the last twelve months?

► *Briefly describe that factor below.*

How did that affect your household?

Did anything else affect your fishing for FISH OTHER THAN SALMON? (Circle one) N Y ?

If **YES**, what was the NEXT MOST IMPORTANT THING that affected your household's fishing for FISH OTHER THAN SALMON in the last twelve months?

► *Briefly describe the factor below.*

How did that affect your household?

Did anything else affect your fishing for FISH OTHER THAN SALMON? (Circle one) N Y ?

If **YES**, what was the NEXT MOST IMPORTANT THING that affected your household's fishing for FISH OTHER THAN SALMON in the last twelve months?

► *Briefly describe that factor below.*

How did that affect your household?

SUBSISTENCE HARVESTS: MARINE INVERTEBRATES

HOUSEHOLD ID

1. Do you or members of your household USUALLY get marine invertebrates for subsistence, such as KING CRAB, or any other marine invertebrates?..... Y N
2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO GET marine invertebrates?..... Y N

IF the answer to QUESTION 2 is NO, go to the MARINE INVERTEBRATES summary page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many marine invertebrates ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE marine invertebrates that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If harvest with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	How many did your HH get? *amount*	Units[3] *specify*	*comments*
KING CRAB	Y N	Y N	Y N	Y N	Y N		IND	
501,008,000								
CLAMS	Y N	Y N	Y N	Y N	Y N		IND	
500,600,000								
MUSSELS	Y N	Y N	Y N	Y N	Y N		GAL	
502,099,000								
SHRIMP	Y N	Y N	Y N	Y N	Y N		GAL	
503,400,000								
UNKNOWN INVERTEBRATES	Y N	Y N	Y N	Y N	Y N		GAL	
509,900,000								
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	

During the last year, did your household use any other kind of marine invertebrates?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, et*

MARINE INVERTEBRATES: 08 **KOBUK: 195**

SUBSISTENCE SUMMARY: MARINE INVERTEBRATES

HOUSEHOLD ID

If this household did NOT USE or HARVEST marine invertebrates last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING ***Refer to data collection maps and mapping instructions to map marine invertebrates...***

NETWORKS ***…then ask the network and assessment questions below***

During the last year[1],

…who HARVESTED (GOT) the INVERTEBRATES your household used? (Enter most important sources first.) 602,020,002

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
HARVESTED (GOT) INVERTEBRATES 1			

…who PROCESSED the INVERTEBRATES your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
2			

…who else (not yet named) GAVE INVERTEBRATES to your household? (Enter most important sources first.)

GAVE INVERTEBRATES TO US 3			

ASSESSMENTS: 500,000,000

To conclude our marine invertebrates section, I am going to ask a few general questions about marine invertebrates.

During the last year[1],

…did your household use LESS, SAME, or MORE marine invertebrates than in recent years?..... X L S M

X = do not use

If LESS or MORE…

WHY was your use different?..... 1 2

► *(IF HOUSEHOLD "DOES NOT USE" marine invertebrates go to NEXT SECTION otherwise continue below:)*

During the last year[1],

…did your household GET ENOUGH marine invertebrates?..... Y N

If NO…

What KIND of marine invertebrates did you need?.....

WHY did your household NOT get enough marine invertebrates?..... 1 2

How would you describe the impact to your household of not getting enough last year?..... not noticable? (0) minor? (1) major? (2) severe? (3)

Did your household do anything DIFFERENTLY because you did NOT get enough marine invertebrates?..... Y N

IF YES…

What did your household do differently?..... 1 2

NETWORKS & ASSESSMENTS OF MARINE INVERTEBRATES: 66, 67 **KOBUK: 195**

SUBSISTENCE HARVESTS: LARGE LAND ANIMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt large land animals for subsistence, such as CARIBOU , MOOSE or any other large land animals?..... Y N
2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO HUNT large land animals?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many large land animals ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE large land animals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	SEX	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Units[3]
							number killed in each month													specify
CARIBOU *Tuttu*	Y N	Y N	Y N	Y N	Y N	BULL														IND
						COW														IND
211,000,000						UNKNOWN														IND
211,000,001																				
211,000,002																				
211,000,009																				
MOOSE *Tiniikaq*	Y N	Y N	Y N	Y N	Y N	BULL														IND
						COW														IND
211,800,000						UNKNOWN														IND
211,800,001																				
211,800,002																				
211,800,009																				
BLACK BEAR *Iyyaġriq*	Y N	Y N	Y N	Y N	Y N															IND
210,600,000																				
BROWN BEAR *Akłaq*	Y N	Y N	Y N	Y N	Y N															IND
210,800,000																				
SHEEP *Ipnaiq*	Y N	Y N	Y N	Y N	Y N															IND
212,200,000																				
MUSKOX *Umiŋmaq*	Y N	Y N	Y N	Y N	Y N															IND
212,000,000																				
	Y N	Y N	Y N	Y N	Y N															IND
	Y N	Y N	Y N	Y N	Y N															IND

During the last year, did your household use any other kind of large land animals?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

LAND MAMMALS: 10 **KOBUK: 195**

SUBSISTENCE HARVESTS: SMALL LAND ANIMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt small land animals for subsistence, such as BEAVER, SNOWSHOE HARE, or any other small land animals?..... Y N
2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO HUNT small land animals?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many small land animals ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE small land animals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Units[3]	Number Used For Food or for Food & Fur
						number killed in each month													*specify*	
BEAVER *Paluqtaq*	Y N	Y N	Y N	Y N	Y N														IND	
220,200,000																				
MUSKRAT *Kigvaluk*	Y N	Y N	Y N	Y N	Y N														IND	
222,400,000																				
SNOWSHOE HARE *Ukalliuraq*	Y N	Y N	Y N	Y N	Y N														IND	
221,004,000																				
ARCTIC HARE (JACKRABBIT) *Ukallisugruk*	Y N	Y N	Y N	Y N	Y N														IND	
221,002,000																				
PORCUPINE *Iluqutaq*	Y N	Y N	Y N	Y N	Y N														IND	
222,600,000																				
MARMOT *Siksrikpak*	Y N	Y N	Y N	Y N	Y N														IND	
221,800,000																				
PARKA SQUIRREL (GROUND) *Siksrik*	Y N	Y N	Y N	Y N	Y N														IND	
222,802,000																				
	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	

During the last year, did your household use any other kind of small land animals?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, et*

LAND MAMMALS: 10 **KOBUK: 195**

SUBSISTENCE HARVESTS: FUR ANIMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt or trap for fur animals for subsistence, such as WOLF, LYNX , or any other fur animals?..... Y N
2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO HUNT OR TRAP FOR fur animals?..... Y N

IF the answer to QUESTION 2 is NO, go to the LAND ANIMALS summary page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many fur animals ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE fur animals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting or trapping with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Units[3]	Number Used For Food or for Food & Fur
						number caught in each month													*specify*	
WOLF *Amaġuq*	Y N	Y N	Y N	Y N	Y N														IND	
223,200,000																				
WOLVERINE *Qapvik, qavvik*	Y N	Y N	Y N	Y N	Y N														IND	
223,400,000																				
LYNX *Nuutuuyiq*	Y N	Y N	Y N	Y N	Y N														IND	
221,600,000																				
RED FOX *Kayuqtuq*	Y N	Y N	Y N	Y N	Y N														IND	
220,804,000																				
ARCTIC FOX *Qusraaq*	Y N	Y N	Y N	Y N	Y N														IND	
220,802,000																				
MARTEN *Qapviatchiaq*	Y N	Y N	Y N	Y N	Y N														IND	
222,000,000																				
RIVER OTTER *Pamiuqtuuq*	Y N	Y N	Y N	Y N	Y N														IND	
221,200,000																				
MINK *Tiġiaqpak*	Y N	Y N	Y N	Y N	Y N														IND	
222,200,000																				
	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	

During the last year, did your household use any other kind of fur animals?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

FURBEARERS: 14 **KOBUK: 195**

SUBSISTENCE SUMMARY: LARGE LAND MAMMALS

HOUSEHOLD ID

If this household did NOT USE or HARVEST large land mammals last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING — ***Refer to data collection maps and mapping instructions to map large land mammals...***

NETWORKS — ***…then ask the network and assessment questions below***

During the last year[1], …who HARVESTED (GOT) the CARIBOU your household used? (Enter most important sources first.) 211,000,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
HARVESTED CARIBOU 1			

During the last year[1], …who PROCESSED the CARIBOU your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED CARIBOU 2			

During the last year[1], …who else GAVE CARIBOU to your household? (Enter most important households or communities first.)

GAVE CARIBOU TO US 3	

During the last year[1], …who HARVESTED (GOT) the MOOSE your household used? (Enter most important sources first.) 211,800,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
HARVESTED (GOT) MOOSE 1			

During the last year[1], …who PROCESSED the MOOSE your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED MOOSE 2			

During the last year[1], …who else not yet named GAVE MOOSE to your household? (Enter most important households or communities first.)

GAVE MOOSE TO US 3	

ASSESSMENTS: 210,000,000

To conclude our large land mammals section, I am going to ask a few general questions about large land mammals.

During the last year[1],
…did your household use LESS, SAME, or MORE large land mammals than in recent years?..... X L S M
X = do not use
If LESS or MORE…
WHY was your use different?..... 1 2

► *(IF HOUSEHOLD "DOES NOT USE" large land mammals, go to NEXT SECTION, otherwise continue below:)*

During the last year[1],
…did your household GET ENOUGH large land mammals?..... Y N
If NO…
What KIND of large land mammals did you need?.....
WHY did your household NOT get enough large land mammals?..... 1 2
How would you describe the impact to your household
of not getting enough last year?..... not noticable? (0) minor? (1) major? (2) severe? (3)
Did your household do anything DIFFERENTLY because you did NOT get enough large land mammals?..... Y N
IF YES…
What did your household do differently?..... 1 2

NETWORKS & ASSESSMENTS OF LARGE LAND MAMMALS: 66, 67 **KOBUK: 195**

SUBSISTENCE HARVESTS: MARINE MAMMALS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt marine mammals for subsistence?..... Y N

2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO HUNT marine mammals?..... Y N

IF the answer to QUESTION 2 is NO, go to the MARINE MAMMALS summary page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many marine mammals ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.

INCLUDE marine mammals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	February	March	April	May	June	July	August	September	October	November	December	January	Unknown	Units[3]	
						number killed in each month													*specify*	*comments*
BEARDED SEAL *Ugruk*	Y N	Y N	Y N	Y N	Y N														IND	
300,802,000																				
RINGED SEAL *Natchiq, Qayaġulik*	Y N	Y N	Y N	Y N	Y N														IND	
300,810,000																				
SPOTTED SEAL *Qasigiaq, Qasrigiaq*	Y N	Y N	Y N	Y N	Y N														IND	
300,812,000																				
UNKNOWN SEAL (or seal oil) *Uqsraq*	Y N	Y N	Y N	Y N	Y N														IND	
300,899,000																				
BELUKHA WHALE *Sisuaq*	Y N	Y N	Y N	Y N	Y N														IND	
301,602,000																				
BOWHEAD WHALE (or maktak) *Aġvik*	Y N	Y N	Y N	Y N	Y N														IND	
301,606,000																				
	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	
	Y N	Y N	Y N	Y N	Y N														IND	

During the last year, did your household use any other kind of marine mammals?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

MARINE MAMMALS: 12 **KOBUK: 195**

SUBSISTENCE SUMMARY: MARINE MAMMALS

HOUSEHOLD ID

If this household did NOT USE or HARVEST marine mammals last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping, network, and assessment sections...

MAPPING — ***Refer to data collection maps and mapping instructions to map marine mammals...***

NETWORKS — ***…then ask the network and assessment questions below***

During the last year …who HARVESTED (GOT) the SEALS your household used? (Enter most important sources first.) 300,800,009

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
HARVESTED (GOT) SEALS			
1			

During the last year …who PROCESSED the SEALS your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED SEALS			
2			

During the last year …who else (not yet named) GAVE SEALS to your household? (Enter most important sources first.)

GAVE SEALS TO US →	
3	

During the last year …who HARVESTED (GOT) the WHALES your household used? (Enter most important sources first.) 301,600,009

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
HARVESTED (GOT) WHALES			
1			

During the last year …who PROCESSED the WHALES your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED WHALES			
2			

During the last year …who else not yet named GAVE WHALES to your household? (Enter most important households or communities first.)

GAVE WHALES TO US →	
3	

ASSESSMENTS: 300,000,000

To conclude our marine mammals section, I am going to ask a few general questions about marine mammals.

During the last year…did your household use LESS, SAME, or MORE marine mammals than in recent years?..... X L S M

X = do not use

If LESS or MORE…

WHY was your use different?..... 1 _____

2 _____

► *(IF HOUSEHOLD "DOES NOT USE" marine mammals, go to NEXT SECTION, otherwise continue below:)*

During the last year…did your household GET ENOUGH marine mammals?..... Y N

If NO…

What KIND of marine mammals did you need?..... _____

WHY did your household NOT get enough marine mammals?..... 1 _____

2 _____

How would you describe the impact to your household of not getting enough last year?..... not noticable? (0) minor? (1) major? (2) severe? (3)

Did your household do anything DIFFERENTLY because you did NOT get enough marine mammals?..... Y N

IF YES…

What did your household do differently?..... 1 _____

2 _____

NETWORKS & ASSESSMENTS OF MARINE MAMMALS: 66, 67 — **KOBUK: 195**

SUBSISTENCE HARVESTS: GEESE

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt geese for subsistence, such as CANADA GEESE, or any other geese?..... Y N
2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO HUNT geese?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many geese ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.

INCLUDE geese that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January February March November December WINTER	April May June SPRING	July August SUMMER	September October FALL	Season of harvest unknown	Units[3]
						number killed in each season				number	specify
CANADA GEESE	Y N	Y N	Y N	Y N	Y N						IND
410,404,990											
WHITE-FRONTED GEESE *Kigiyuk*	Y N	Y N	Y N	Y N	Y N						IND
410,410,000											
BRANT *Niġliġnaq, nigliqnaurat*	Y N	Y N	Y N	Y N	Y N						IND
410,402,000											
EMPEROR GEESE *Liġliqpak*	Y N	Y N	Y N	Y N	Y N						IND
410,406,000											
SNOW GEESE *Kaŋuq*	Y N	Y N	Y N	Y N	Y N						IND
410,408,000											
UNKNOWN GEESE	Y N	Y N	Y N	Y N	Y N						IND
410,499,000											
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND

During the last year, did your household use any other kind of geese?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, et*

BIRDS AND EGGS: 15 **KOBUK: 195**

HARVESTS: DUCKS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt ducks for subsistence, such as MALLARD, NORTHERN PINTAIL, or any other ducks?..... Y N
2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO HUNT ducks?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

- A …use[2] _____?
- B …receive _____ from another HH or community?
- C …give _____ to another HH or community?
- D …try[2] to harvest _____?
- E ...actually harvest any _____?

IF harvest is YES

Please estimate how many ducks ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.

INCLUDE ducks that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January February March November December WINTER	April May June SPRING	July August SUMMER	September October FALL	Season of harvest unknown *number*	Units[3] *specify*
						number killed in each season					
MALLARD *Ivugasrugruk*	Y N	Y N	Y N	Y N	Y N						IND
410,214,000											
LONG-TAILED DUCK *Aahaaliq*	Y N	Y N	Y N	Y N	Y N						IND
410,218,000											
NORTHERN PINTAIL *Ivugaq, Kurugaq*	Y N	Y N	Y N	Y N	Y N						IND
410,220,000											
WIGEON *Ugiihiq*	Y N	Y N	Y N	Y N	Y N						IND
410,236,020											
GREEN WINGED TEAL *Qaiñiq*	Y N	Y N	Y N	Y N	Y N						IND
410,232,060											
NORTHERN SHOVELER *Aluutaq*	Y N	Y N	Y N	Y N	Y N						IND
410,230,000											
SCAUP *Qaqłutuuq*	Y N	Y N	Y N	Y N	Y N						IND
410,226,000											
BUFFLEHEAD *Nunuqsiiġiłaq*	Y N	Y N	Y N	Y N	Y N						IND
410,202,000											
HARLEQUIN DUCK *Saġvam tiŋmiaq*	Y N	Y N	Y N	Y N	Y N						IND
410,212,000											
GOLDENEYE	Y N	Y N	Y N	Y N	Y N						IND
410,210,000											

DUCKS continued on next page…

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*

2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*

3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

HARVESTS: DUCKS

HOUSEHOLD ID

DUCKS continued from previous page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
E …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many ducks ALL MEMBERS OF YOUR HOUSEHOLD killed for subsistence uses during the last year.

INCLUDE ducks that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January February March November December	April May June	July August	September October	Season of harvest unknown	Units[3]
						WINTER	SPRING	SUMMER	FALL		
						number killed in each season				*number*	*specify*
CANVASBACK	Y N	Y N	Y N	Y N	Y N						IND
410,204,000											
BLACK SCOTER *Tuuŋġaaġruk*	Y N	Y N	Y N	Y N	Y N						IND
410,228,020											
SURF SCOTER	Y N	Y N	Y N	Y N	Y N						IND
410,228,040											
WHITE-WINGED SCOTER *Killalik*	Y N	Y N	Y N	Y N	Y N						IND
410,228,060											
COMMON EIDER *Mitiqliqruaq*	Y N	Y N	Y N	Y N	Y N						IND
410,206,020											
UNKNOWN EIDER	Y N	Y N	Y N	Y N	Y N						IND
410,206,990											
UNKNOWN DUCKS	Y N	Y N	Y N	Y N	Y N						IND
410,299,000											
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND

During the last year, did your household use any other kind of ducks?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

* *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*

** *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*

*** *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

SUBSISTENCE HARVESTS: OTHER BIRDS

HOUSEHOLD ID

1. Do you or members of your household USUALLY hunt other birds for subsistence, such as PTARMIGAN, SANDHILL CRANE, or any other other birds?..... Y N
2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO HUNT other birds?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many other birds ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE other birds that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	January February March November December WINTER	April May June SPRING	July August SUMMER	September October FALL	Season of harvest unknown *number*	Units[3] *specify*
						number got in each season					
PTARMIGAN *Aqargik, Niqsaaqtuŋiq*	Y N	Y N	Y N	Y N	Y N						IND
421,804,000											
GROUSE *Urgiiłim, Napaaqtum Aqargiq*	Y N	Y N	Y N	Y N	Y N						IND
421,802,000											
SANDHILL CRANE *Tatirgaq*	Y N	Y N	Y N	Y N	Y N						IND
410,802,000											
TUNDRA SWAN *Qugruk*	Y N	Y N	Y N	Y N	Y N						IND
410,604,000											
SEABIRD (specify kind)	Y N	Y N	Y N	Y N	Y N						IND
411,299,000											
SHOREBIRD (specify kind)	Y N	Y N	Y N	Y N	Y N						IND
411,000,000											
LOON (specify kind)	Y N	Y N	Y N	Y N	Y N						IND
411,216,990											
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND
	Y N	Y N	Y N	Y N	Y N						IND

During the last year, did your household use any other kind of other birds?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc*

BIRDS AND EGGS: 15 **KOBUK: 195**

SUBSISTENCE HARVESTS: EGGS

HOUSEHOLD ID

1. Do you or members of your household USUALLY gather eggs for subsistence?..... Y N

2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO GATHER eggs?..... Y N

IF the answer to QUESTION 2 is NO, go to the BIRD & EGG summary page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household…

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many eggs ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE eggs that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If gathering with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	How many did you gather? *amount*	Units[3] *specify*	*comments*
DUCK EGGS (specify kind)	Y N	Y N	Y N	Y N	Y N			
430,200,000 GEESE EGGS (specify kind)	Y N	Y N	Y N	Y N	Y N			
430,400,000 SWAN EGGS	Y N	Y N	Y N	Y N	Y N			
430,600,000 SHORE BIRD EGGS	Y N	Y N	Y N	Y N	Y N			
431,099,000 GULL EGGS (specify kind)	Y N	Y N	Y N	Y N	Y N			
431,212,990 UNKNOWN EGGS	Y N	Y N	Y N	Y N	Y N			
439,900,000	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			IND

During the last year, did your household use any other kind of eggs?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, et*

SUBSISTENCE SUMMARY: BIRDS & EGGS

HOUSEHOLD ID

If this household did NOT USE or HARVEST birds & eggs last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING — ***Refer to data collection maps and mapping instructions to map birds & eggs...***

NETWORKS — ***…then ask the network and assessment questions below***

During the last year[1],

…who HARVESTED (GOT) the BIRDS & EGGS your household used? (Enter most important sources first.) 400,000,000

	People in THIS household	People in OTHER Kobuk HOUSEHOLDS	People in OTHER COMMUNITIES
role	(enter person ID# from page 2)	(Enter Household ID# of other households)	(Write in name of other communities)
HARVESTED (GOT) BIRDS & EGGS			
1			

…who PROCESSED the BIRDS & EGGS your household used? (Enter most important sources first.)

	People in THIS household	People in OTHER Kobuk HOUSEHOLDS	People in OTHER COMMUNITIES
role	(enter person ID# from page 2)	(Enter Household ID# of other households)	(Write in name of other communities)
PROCESSED BIRDS & EGGS			
2			

…who else (not yet named) GAVE BIRDS & EGGS to your household? (Enter most important households or communities first.)

GAVE BIRDS & EGGS TO US	→
3	

ASSESSMENTS: 400,000,000

To conclude our birds & eggs section, I am going to ask a few general questions about birds & eggs.

During the last year[1],

…did your household use LESS, SAME, or MORE birds & eggs than in recent years?..... X L S M

If LESS or MORE… *X = do not use*

WHY was your use different?..... 1 2

► *(IF HOUSEHOLD "DOES NOT USE" birds and eggs, go to NEXT SECTION, otherwise continue below:)*

During the last year[1],

…did your household GET ENOUGH birds & eggs?..... Y N

If NO…

What KIND of birds & eggs did you need?.....

WHY did your household NOT get enough birds & eggs?..... 1 2

How would you describe the impact to your household of not getting enough last year?..... not noticable? (0) minor? (1) major? (2) severe? (3)

Did your household do anything DIFFERENTLY because you did NOT get enough birds & eggs?..... Y N

IF YES…

What did your household do differently?..... 1 2

NETWORKS & ASSESSMENTS OF BIRDS & EGGS: 66, 67 **KOBUK: 195**

SUBSISTENCE HARVESTS: BERRIES

HOUSEHOLD ID

1. Do you or members of your household USUALLY pick berries for subsistence, such as BLUEBERRIES, SALMONBERRIES, or any other berries?..... Y N
2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO PICK berries?..... Y N

IF the answer to QUESTION 2 is NO, go to the next harvest page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many berries ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE berries that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If picking with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	How many did you pick? *amount*	Units[3] *specify*	*comments*
BLUEBERRIES *Asriavik*	Y N	Y N	Y N	Y N	Y N		GAL	
601,002,000								
SALMONBERRIES *Aqpik*	Y N	Y N	Y N	Y N	Y N		GAL	
601,022,000								
LACKBERRIES(CROWBERRIES *Paunġaq*	Y N	Y N	Y N	Y N	Y N		GAL	
601,007,000								
LOW-BUSH CRANBERRIES *Kikmiññaq*	Y N	Y N	Y N	Y N	Y N		GAL	
601,004,000								
HIGH-BUSH CRANBERRIES *Uqpiŋñaq*	Y N	Y N	Y N	Y N	Y N		GAL	
601,006,000								
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	
	Y N	Y N	Y N	Y N	Y N		GAL	

During the last year, did your household use any other kind of berries?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, et*

PLANTS: 17 **KOBUK: 195**

SUBSISTENCE HARVESTS: PLANTS/GREENS/MUSHROOMS

HOUSEHOLD ID

1. Do you or members of your household USUALLY pick plants/greens/mushrooms for subsistence, such as WILLOW LEAVES , STINKWEED or any other plants/greens/mushrooms?..... Y N
2. During the last year (between FEBRUARY 1, 2012, AND JANUARY 31, 2013), did you or members of your household USE or TRY TO PICK plants/greens/mushrooms?..... Y N

IF the answer to QUESTION 2 is NO, go to the next BERRIES & GREENS summary page.

IF the answer is YES, continue on this page…

During the last year[1], did you or members of your household….

A …use[2] _____?
B …receive _____ from another HH or community?
C …give _____ to another HH or community?
D …try[2] to harvest _____?
E ...actually harvest any _____?

IF harvest is YES

Please estimate how many plants/greens/mushrooms ALL MEMBERS OF YOUR HOUSEHOLD got for subsistence uses during the last year.

INCLUDE plants/greens/mushrooms that members of this household gave away, ate fresh, lost to spoilage, or got by helping others. If picking with or helping others, report ONLY this household's share of the harvest.

Read names below in blanks above	A USE?	B REC?	C GIVE?	D TRY?	E HAR?	How many did you pick? *amount*	Units[3] *specify*	*comments*
WILLOW LEAVES *Sura*	Y N	Y N	Y N	Y N	Y N		GAL	
602,031,000								
SOURDOCK *Quaġaq*	Y N	Y N	Y N	Y N	Y N		GAL	
602,028,000								
STINKWEED *Sargiq, Sargiġruaq*	Y N	Y N	Y N	Y N	Y N		GAL	
602,044,000								
ESKIMO (LABRADOR) TEA *Tilaaqqiuq*	Y N	Y N	Y N	Y N	Y N		GAL	
602,018,000								
ESKIMO POTATO *Masru*	Y N	Y N	Y N	Y N	Y N		GAL	
602,009,000								
SEA LOVAGE *Tukkaayuk*	Y N	Y N	Y N	Y N	Y N		GAL	
602,048,000								
BEACH GREENS *Atchaaqfuq*	Y N	Y N	Y N	Y N	Y N		GAL	
602,048,000								
FIREWOOD	Y N	Y N	Y N	Y N	Y N		CORD	*If UNIT is sled or boat load, enter sizes per load* *N of LOGS = LENGTH= DIAMETER=*
604,000,000								*In coding, convert boat and sled loads to CORDS.*
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N		GAL	

During the last year, did your household use any other kind of plants/greens/mushrooms?..... Y N

IF YES, enter the name in a blank row above, and answer the questions in that row.

1 *"LAST YEAR" means between FEBRUARY 1, 2012, and JANUARY 31, 2013.*
2 *"USE" includes harvesting, processing, eating, trading, feeding to dogs, etc. "TRY" includes looking, hunting, fishing, or any attempt to get.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, et*

PLANTS: 17 **KOBUK: 195**

SUBSISTENCE SUMMARY: VEGETATION

HOUSEHOLD ID

If this household did NOT USE or HARVEST vegetation last year, go to the ASSESSMENT section below.
Otherwise, continue with mapping, network, and assessment sections...

MAPPING — ***Refer to data collection maps and mapping instructions to map vegetation...***

NETWORKS — ***…then ask the network and assessment questions below***

During the last year[1], …who PICKED the BERRIES your household used? (Enter most important sources first.) 601,000,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PICKED BERRIES 1			

During the last year[1], …who PROCESSED the BERRIES your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED BERRIES 2			

During the last year[1], …who else GAVE BERRIES to your household? (Enter most important households or communities first.)

GAVE BERRIES TO US 3 →

During the last year[1], …who PICKED the other PLANTS/GREENS/MUSHROOMS your household used? (Enter most important sourc 602,000,000

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PICKED PLANTS/GREENS/MUSHR 1			

During the last year[1], …who PROCESSED the other PLANTS/GREENS/MUSHROOMS your household used? (Enter most important sources first.)

role	People in THIS household (enter person ID# from page 2)	People in OTHER Kobuk HOUSEHOLDS (Enter Household ID# of other households)	People in OTHER COMMUNITIES (Write in name of other communities)
PROCESSED PLANTS/GREENS/MUSHR 2			

…who else not yet named GAVE PLANTS/GREENS/MUSHROOMS to your household? (Enter most important households or communities first.)

GAVE PLANTS/GREENS/MUSHROOMS TO US 3 →

ASSESSMENTS: 600,000,000

To conclude our vegetation section, I am going to ask a few general questions about vegetation. (Berries and plants/greens/mushrooms.)

During the last year[1],

…did your household use LESS, SAME, or MORE berries and vegetation than in recent years?..... X L S M

X = do not use

If LESS or MORE…

WHY was your use different?..... 1 _____ 2 _____

► *(IF HOUSEHOLD "DOES NOT USE" VEGETATION (berries or plants/greens/mushrooms), go to NEXT SECTION, otherwise continue below:)*

During the last year[1],

…did your household GET ENOUGH vegetation?..... Y N

If NO…

What KIND of vegetation did you need?..... _____

WHY did your household NOT get enough vegetation?..... 1 _____ 2 _____

How would you describe the impact to your household of not getting enough last year?..... not noticable? (0) minor? (1) major? (2) severe? (3)

Did your household do anything DIFFERENTLY because you did NOT get enough vegetation?..... Y N

IF YES…

What did your household do differently?..... 1 _____ 2 _____

NETWORKS & ASSESSMENTS OF VEGETATION: 66, 67 — **KOBUK: 195**

ASSESSMENTS

HOUSEHOLD ID

SUBSISTENCE ASSESSMENTS: ALL RESOURCES 0

To conclude our subsistence harvest section, I am going to ask a few general questions about ALL SUBSISTENCE RESOURCES.

Last year…

…did your household use LESS, SAME, or MORE subsistence resources than in recent years? X L S M

If LESS or MORE… *X = do not use*

WHY was your use different? 1

2

Last year…

…did your household GET ENOUGH subsistence resources? Y N

If NO…

What KIND of subsistence resources did you need?

WHY did your household NOT get enough all resources? 1

2

How would you describe the impact to your household of not getting enough all resources last year? ...not noticable? (0) ...minor? (1) ...major? (2) severe? (3)

Did your household do anything DIFFERENTLY because you did NOT get enough all resources? Y N

IF YES…

What did your household do differently? 1

2

ASSESSMENTS: 66 **KOBUK: 195**

FOOD SECURITY

HOUSEHOLD ID

The questions on this page have been asked all over the United States to find out if Americans have enough to eat. We would like to know if people in your community have enough to eat. I am going to read you FIVE statements about different food situations. Please tell me whether EACH statement was true for your household (HH) in the last 12 months.

Think about all your household's food, both subsistence and store-bought…

STATEMENT 1. We WORRIED that our household would not have ENOUGH FOOD. HH2

In the last 12 months, was this ever true for your household?..... N Y ? ____ if Y

If YES…

…in which months did this happen?..... J F M A M J J A S O N D

…did this happen because your HH couldn't get SUBSISTENCE foods, your HH couldn't get STORE-BOUGHT foods, or your HH couldn't get BOTH KINDS of food?..... SUB STOR BOTH ____

STATEMENT 2. We could not get the kinds of foods we wanted to eat because of a LACK OF RESOURCES. HH4

By "lack of resources," we mean your household (HH) did NOT have what you needed to hunt, fish, gather, or buy food.

In the last 12 months, was this ever true for your household?..... N Y ? ____ if Y

If YES…

…in which months did this happen?..... J F M A M J J A S O N D

…did this happen because your HH couldn't get SUBSISTENCE foods,your HH couldn't get STORE-BOUGHT foods, or your HH couldn't get BOTH KINDS of food?..... SUB STOR BOTH ____

STATEMENT 3. The food we had JUST DID NOT LAST, and we could not get more. HH3

In the last 12 months, was this ever true for your household?..... N Y ? ____ if Y

If YES, in which months did this happen?..... J F M A M J J A S O N D

Now, think just about your household's SUBSISTENCE food…

STATEMENT 4. The SUBSISTENCE food we had just did not last, and we could not get more.

In the last 12 months, was this ever true for your household?..... N Y ? ____

If YES, in which months did this happen?..... J F M A M J J A S O N D

Now, think just about your household's STORE-BOUGHT food…

STATEMENT 5. The STORE-BOUGHT food we had just did not last, and we could not get more.

In the last 12 months, was this ever true for your household?..... N Y ? ____

If YES, in which months did this happen?..... J F M A M J J A S O N D

If Statements 1, 2, AND 3 were ALL "NO," go to the next page.

If any ONE of Statements 1, 2, OR 3 was "YES," continue on this page…

In the last 12 months, did you or other adults in your household ever CUT THE SIZE OF YOUR MEALS OR SKIP MEALS because the HH could not get the food that was needed?..... N Y ? AD1

If YES, in which months did this happen?..... J F M A M J J A S O N D

In the last 12 months, did you or other adults in your household ever EAT LESS THAN YOU FELT YOU SHOULD because the HH could not get the food that was needed?..... N Y ? AD2

In the last 12 months, were adults in the HH ever HUNGRY BUT DID NOT EAT because there was not enough food?..... N Y ? AD3

In the last 12 months, did adults in the HH LOSE WEIGHT because there was not enough food?..... N Y ? AD4

In the last 12 months, did you or other adults in your household ever NOT EAT FOR A WHOLE DAY because there was not enough food?..... N Y ? AD5

If YES, in which months did this happen?..... J F M A M J J A S O N D

FOOD SECURITY: 201 **KOBUK: 195**

COMMENTS & SUMMARY

HOUSEHOLD ID

QUESTIONS, COMMENTS, CONCERNS

Do you have any questions, comments, or concerns?

INTERVIEW SUMMARY

Use this space for interviewer's comments about survey, especially factors that might have affected the household's responses.

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

INTERVIEW SUMMARY: 30 **KOBUK: 195**

APPENDIX B–TRADITIONAL ECOLOGICAL KNOWLEDGE INTERVIEW PROTOCOL

2013 Ambler Access TEK Interview Protocol (Ambler, Shungnak and Kobuk)

Part 1. Demographic Information
In the beginning of each interview, I recommend asking some basic demographic questions:

1. name
2. year/location born
3. parents names and where from?
4. how long has respondent been hunting/fishing?

Part 1. Local History. Often it is helpful to ask questions of key respondents about the community's history, especially key dates or events that might have affected how or where people engaged in subsistence activities. Based on your knowledge of a community's history, these questions will differ (and will be more precise for each village based on this knowledge). Some general questions could be:

a. *Have there been any major events that have changed subsistence practices overall?*

b. *How are gas prices affecting how, where, or when people harvest wild foods?*

c. *Are young people interested in hunting and fishing? Are food preferences the same or different as they were in the past?*

Then, it is often useful to take the seasonal round approach when doing interviews and let people answer the questions below through the structure of a description of the parts of the seasonal round that they participate in. That way, you can also document seasonal camps used in the past or currently used by respondent. **[Keep in mind that you do not have to do it this way, but the species sections below are ordered by a seasonal round. Skip around if that works better for you and your respondent.]**

Part 2. Migratory Bird hunting and other Bird hunting: (Ask about specific bird species, including migratory birds, shorebirds and sea birds, and grouse, ptarmigan, and snowy owl).

1. Please describe your current bird hunting practices:

a. What are the primary species you try to get every year? Do you collect eggs (which kinds?)

b. Who do you hunt with year to year? How is this determined?

c. If you are successful, what do you do with the birds – how do you distribute/share it?

d. How do you preserve/process your harvest?

e. How do you feel the different bird populations are doing right now? Why do you think the population is declining/increasing? Are the different bird species healthy?

f. Are there environmental factors that contribute to changes in bird migrations and hunting? (changing weather patterns, changing habitat, etc.)

g. Are younger people learning to hunt birds? If so, how do they do that? How did you learn?

h. Can you show us where you hunt now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?

i. Are there any rules about hunting or the treatment of birds during hunting/harvest?

j. Native names for birds or other aspects of bird hunting? Do you remember any traditional stories about birds or bird hunting in your village?

k. Are there any natural seasonal indicators that you use to know when the birds will come?

l. Are there any bird species that are more or less commonly now than in the past?

m. Was there anything specific about last year's harvest that was different or remarkable that may have made that year different than others (not including what has already been discussed)?

Part 3. Fishing – ask questions for each species, both salmon and non-salmon (households are likely to harvest multiple species. While we want to document all species they harvest, the most important species to cover will be: whitefish [differentiate species if possible – remember that not everyone considers sheefish to be a whitefish], grayling, trout, pike, burbot, sheefish. If a household heavily harvests another species, document that as much as possible.**)**

1. Please describe your current salmon fishing practices:

a. Which species do you harvest? Timing of that harvest (for each species)?

b. Do you fish with other people? How is this determined?

c. What are the primary means you use to harvest different species of salmon? (gear type by species?)

d. What do you do with the fish you harvest – how do you distribute/share it?

e. Are younger people learning to fish? If so, how do they do that? How did you learn?

f. How do you feel the fish population is doing right now? Why do you think the population is declining/increasing? Are the [non- salmon species] healthy? Is the size of the fish the same? Are fish fatter or skinnier than they used to be? Are you catching any diseased or deformed fish now?

g. Have your fishing areas changed at all? (map changes in area – currently and 10-20 years ago)

h. If there are changes to your fishing areas, what explains those changes? (environmental conditions, personal circumstances, traditional areas, changes in the fish population, regulations, etc)

i. Are there environmental factors that contribute to changes in fishing? (weather, river conditions, etc)

g. Which parts of the fish do you use? How do you preserve/process these parts?

h. Are there any rules about fishing or the treatment of fish/nets during fishing?

i. Native names for fish species or other aspects of fishing? Do you remember any traditional stories about fish species or fishing in your village?

l. Are there any fish species that are more or less commonly now than in the past?

m. Was there anything specific about last year's harvest that was different or remarkable that may have made that year different than others (not including what has already been discussed)?

2. Please describe your current non-salmon fishing practices:

a. Which species do you harvest? Timing of that harvest (for each species)?

b. Do you fish with other people? How is this determined?

c. What are the primary means you use to harvest different species of fish? (gear type by species?)

d. What do you do with the fish you harvest – how do you distribute/share it?

e. Are younger people learning to fish? If so, how do they do that? How did you learn?

f. How do you feel the fish population is doing right now? Why do you think the population is declining/increasing? Are the [non- salmon species] healthy? Is the size of the fish the same? Are fish fatter or skinnier than they used to be? Are you catching any diseased or deformed fish now?

g. Have your fishing areas changed at all? (map changes in area – currently and 10-20 years ago)

h. If there are changes to your fishing areas, what explains those changes? (environmental conditions, personal circumstances, traditional areas, changes in the fish population, regulations, etc)

i. Are there environmental factors that contribute to changes in fishing? (weather, river conditions, etc)

g. Which parts of the fish do you use? How do you preserve/process these parts?

h. Are there any rules about fishing or the treatment of fish/nets during fishing?

i. Native names for fish species or other aspects of fishing? Do you remember any traditional stories about fish species or fishing in your village?

l. Are there any fish species that are more or less commonly now than in the past?

m. Was there anything specific about last year's harvest that was different or remarkable that may have made that year different than others (not including what has already been discussed)?

Part 4. Large game hunting (especially caribou, but also: moose, brown bear, black bear)

1. Please describe your current big game hunting practices (for each…)

a. who do you hunt with year to year? How is this determined?

b. if you are successful, what do you do with the moose/bear/caribou – how do you distribute/share it?

c. which parts of the bear/caribou do you use? How do you preserve/process these parts?

d. how do you feel the bear/caribou population is doing right now? Why do you think the population is declining/increasing? Are they healthy?

e. can you show us where you hunt now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?

f. Are there environmental factors that contribute to changes in bear/caribou hunting? (weather, river conditions, winter conditions, migratory routes (caribou), etc)

g. are younger people learning to hunt? If so, how do they do that? How did you learn?

h. are there any rules about hunting or the treatment of bear/caribou or other animals during moose hunting/harvest?

i. native names for moose/bear/caribou or other aspects of bear/caribou hunting? Do you remember any traditional stories about bear/caribou or bear/caribou hunting in your village?

l. Are there any species that are more or less commonly now than in the past?

m. Was there anything specific about last year's harvest that was different or remarkable that may have made that year different than others (not including what has already been discussed)?

n. "User conflict" between local hunters and non-local hunters has been a long-term issue in the Noatak and Upper Kobuk areas. What have been your experiences with non-local hunters in this area? Have you have had hunts disrupted by aircraft or boat activity? When? Where? (Be as specific as possible.) What, if any, impact has non-local hunting had on your hunting activities, or on the caribou?

Part 5. Trapping

1. Please describe your current trapping practices:

a. do you trap with anyone else? How is this determined?

b. how do you 'hold' your trapline? From whom (if anyone) did you get it/take it over?

c. are younger people learning to trap? If so, how do they do that? How did you learn?

d. what species do you trap? Why?

e. how do you feel the population of the animals you trap is doing right now? Why do you think the population is declining/increasing? Are the species you trap healthy?

f. can you show us where you trap now (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?

g. Are there environmental factors that contribute to changes in trapping? (changing weather, snow pack, river conditions, etc)

l. Are there any furbearer species that are more or less commonly now than in the past?

m. Was there anything specific about last year's harvest that was different or remarkable that may have made that year different than others (not including what has already been discussed)?

Part 6. Vegetation: (Please ask about specific species: berries, mushrooms, other plants).

1. Please describe your current plant gathering practices:

a. do you go berry picking (etc.) with anyone else? How is this determined?

c. are younger people interested in participating in berry picking (etc.)? If so, how do they do that? How did you learn?

d. what species of plants do you gather? Why?

e. how do you feel the population of the (berries, vegetation) is doing right now? Why do you think the population is declining/increasing? Are the plants healthy?

f. can you show us where you gather berries (etc.) (or in the last 5 years?) what about the last 10 or 20 years? Have those areas changed at all?

g. Are there environmental factors that contribute to changes in gathering plants? (changing weather, snow pack, river conditions, etc)

l. Are there any plant species that are more or less commonly now than in the past?

m. Was there anything specific about last year's harvest that was different or remarkable that may have made that year different than others (not including what has already been discussed)?

Part 7. Comments/Concerns related to proposed road to Ambler mining district

a. Do you have any comments or concerns about the proposed road that would connect the Ambler mining district to Interior Alaska?

Part 8. Wrap-up.

a. *Is there anything else that we are missing that is important about subsistence hunting, fishing, or gathering activities?*

b. *For elders, is there anything specific that you would like to share with younger generations?*

APPENDIX C–CONVERSION FACTORS

Conversion factors, Ambler Mining District communities, Alaska, 2012.

The following table presents the conversion factors used in determining how many pounds were harvested of each resource surveyed. For instance, if respondents reported harvesting 3 quarts of smelt, the quantity would be multiplied by the appropriate conversion factor (in this case 1.5) to show a harvest of 4.5 lb of smelt.

Resource name	Reported units	Conversion factor
Chum salmon	ind	5.68
Chum salmon [CF retention]	ind	5.68
Coho salmon	ind	6.46
Coho salmon [CF retention]	ind	6.46
Chinook salmon	ind	13.24
Chinook salmon [CF retention]	ind	13.24
Pink salmon	ind	3.63
Pink salmon [CF retention]	ind	3.63
Sockeye salmon	ind	6.00
Sockeye salmon [CF retention]	ind	6.00
Unknown salmon	ind	4.32
Pacific herring	ind	0.18
Smelt	ind	0.25
Saffron cod	ind	0.21
Pacific halibut	ind	21.20
Burbot	ind	4.20
Dolly Varden	ind	3.30
Dolly Varden [CF retention]	ind	3.30
Lake trout	ind	4.00
Arctic grayling	ind	0.90
Northern pike	ind	3.30
Sheefish	ind	11.14
Sheefish [CF retention]	ind	11.14
Broad whitefish	ind	3.20
Broad whitefish [CF retention]	ind	3.20
Bering cisco	ind	1.40
Least cisco	ind	0.40
Humpback whitefish	ind	2.10
Round whitefish	ind	0.70
Unknown whitefish	ind	2.00
Black bear	ind	88.00
Brown bear	ind	86.00
Caribou	ind	136.00
Moose	ind	538.00
Muskox	ind	295.00
Dall sheep	ind	104.00
Beaver	ind	20.00
Arctic fox	ind	0.00
Red fox	ind	0.00
Alaska hare	ind	6.30
Snowshow hare	ind	2.50
River otter	ind	0.00
Lynx	ind	0.00

-continued-

Resource name	Reported units	Conversion factor
Marmot	ind	5.00
Marten	ind	0.00
Mink	ind	0.00
Muskrat	ind	1.80
Porcupine	ind	8.00
Arctic ground (parka) squirrel	ind	0.50
Weasel	ind	0.00
Wolf	ind	0.00
Wolverine	ind	0.00
Bearded seal	ind	420.00
Ringed seal	ind	74.00
Spotted seal	ind	98.00
Unknown seal	ind	98.00
Walrus	ind	770.00
Beluga	ind	995.00
Bowhead	ind	28677.00
Bufflehead	ind	0.40
Canvasback	ind	2.00
Common eider	ind	4.14
Unknown eider	ind	3.00
Goldeneye	ind	1.54
Harlequin duck	ind	1.00
Mallard	ind	1.95
Long-tailed duck	ind	1.34
Northern pintail	ind	1.56
Scaup	ind	1.68
Black scoter	ind	1.76
Surf scoter	ind	1.58
White-winged scoter	ind	2.29
Northern shoveler	ind	1.09
Green-winged teal	ind	0.52
Wigeon	ind	1.31
Unknown duck	ind	1.50
Brant	ind	2.28
Canada goose	ind	3.42
Emperor goose	ind	4.64
Snow goose	ind	4.00
White-fronted goose	ind	4.24
Unknown goose	ind	3.34
Tundra swan	ind	11.21
Sandhill crane	ind	6.75
Unknown shorebird	ind	0.10
Unknown loon	ind	5.44
Unknown seabird	ind	0.50
Grouse	ind	0.70
Ptarmigan	ind	1.00
Duck egg	ind	0.15
Goose egg	ind	0.27

-continued-

Resource name	Reported units	Conversion factor
Swan egg	ind	0.63
Shorebird egg	ind	0.05
Gull egg	ind	0.30
Black-legged kittiwake egg	ind	0.15
Murre egg	ind	0.22
Tern egg	ind	0.05
Unknown egg	ind	0.18
Razor clam	ind	0.25
Unknown clam	ind	0.10
King crab	ind	2.10
King crab [CF retention]	ind	2.10
Mussels	gal	1.50
Shrimp	gal	2.00
Unknown marine invertebrates	gal	2.13
Blueberry	gal	4.00
Blueberry	qt	1.00
Lowbush cranberry	gal	4.00
Lowbush cranberry	qt	1.00
Lowbush cranberry	pt	0.50
Lowbush cranberry	half-pt	0.25
Highbush cranberry	gal	4.00
Highbush cranberry	half-pt	0.25
Crowberry	gal	4.00
Crowberry	qt	1.00
Crowberry	half-pt	0.25
Raspberry	gal	4.00
Salmonberry	gal	4.00
Salmonberry	qt	1.00
Salmonberry	pt	0.50
Other wild berry	gal	4.00
Other wild berry	qt	1.00
Wild rhubarb	lbs	1.00
Wild rhubarb	gal	4.00
Eskimo potato	ind	0.06
Eskimo potato	lbs	1.00
Eskimo potato	gal	4.00
Eskimo potato	pt	0.50
Hudson's Bay (Labrador) tea	gal	1.00
Hudson's Bay (Labrador) tea	qt	0.25
Hudson's Bay (Labrador) tea	pt	0.13
Sourdock	gal	1.00
Willow leaves	gal	1.00
Wild celery	gal	1.00
Wild rose hips	pt	0.50
Other wild greens	gal	1.00
Unknown mushrooms	gal	1.00
Stinkweed	gal	1.00
Stinkweed	qt	0.25

-continued-

Resource name	Reported units	Conversion factor
Puffballs	gal	1.00
Unknown greens from land	gal	1.00
Bark	gal	1.00
Roots	gal	1.00
Other wood	gal	1.00
Other wood	crd	0.00

Source ADF&G Division of Subsistence household surveys, 2013.

APPENDIX D–ADDITIONAL TABLES

Table D1-1. – Comparison of selected findings, Ambler Mining District communities, 2012.

Category	Community		
	Ambler	Shungnak	Kobuk
Demography			
Population	282.5	274.5	164.4
Percentage of population that is Alaska Native	86.8%	91.3%	86.9%
Percentage of household heads born in Alaska	78.2%	82.9%	82.2%
Average length of residency of household heads (year)	38.2	38.9	32.5
Cash economy			
Average number of months employed	8.6	8.0	8.1
Percentage of employed adults working year round	42.9%	35.8%	36.5%
Percentage of income from sources other than employment	28.0%	28.7%	29.4%
Average household income[a]	$63,255	$59,708	$51,581
Per capita income[a]	$17,018	$15,009	$11,295
Resource harvest and use			
Per capita harvest, pounds usable weight	603.4	367.5	308.7
Average household harvest, pounds usable weight	2,243.0	1,461.9	1,409.5
Number of resources used by 50% or more households	9.0	9.0	11.0
Average number of resources used per household	15.1	12.8	14.6
Average number of resources attempted to be harvested per household	10.2	7.2	9.9
Average number of resources harvested per household	9.3	6.7	9.4
Average number of resources received per household	7.8	8.1	8.5
Average number of resources given away per household	6.2	5.0	6.9
Percent of total harvest taken by top 25%	73.6%	68.8%	67.5%
Percent of households taking 70% of harvest	20.8%	23.9%	26.7%
Per capita harvest of lowest 50% of households	48.7	23.7	37.8
Percent of total harvest harvested by lowest 50% of households	8.1%	6.4%	12.2%
Average number of resources used by lowest 50% of households	10.8	9.1	11.9
Average number of resources used by top 25% of households	22.9	18.8	19.9

Source ADF&G Division of Subsistence household surveys, 2013.

a. Includes income from sources other than employment.

Table D2-1. – Birthplaces of household heads, Ambler, 2012.

Residence of parents of households heads	Community of residence of household head
	Ambler
Allakaket/Alatna	1.1%
Ambler	51.7%
Kotzebue	2.3%
Noatak	1.1%
Noorvik	1.1%
Selawik	4.6%
Shungnak	12.6%
Kobuk River Camp	1.1%
Other U.S.	21.8%
Foreign	2.3%

Source ADF&G Division of Subsistence household surveys, 2013.

Table D2-2. – Comparison of median incomes, Ambler, 2012.

	Median[a]	Range[b,c]
2012 Subsistence Division estimate	$52,757	$35,097–$60,380
2008–2012 ACS (Ambler city)	$43,333	$24,853–$61,813
2008–2012 ACS (All Alaska)	$69,917	$69,179–$70,655

Sources ADF&G Division of Subsistence household surveys, 2013; American Community Survey (ACS) 5-year average results (2008–2012).

a. 2012 Subsistence Division estimate does not include categories of income excluded by the 2008–2012 ACS median estimate, including food stamps, housing assistance, and one-time payments.

b. Range is a 95% confidence interval of the estimated median.

c. ACS data range is the reported margin of error.

Table D2-3. – Employment characteristics, Ambler, 2012.

Characteristic	Community Ambler
All adults	
Number	189.3
Mean weeks employed	23.6
Employed adults	
Number	122.5
Percentage	64.7%
Jobs	
Number	143.9
Mean	1.2
Minimum	1
Maximum	3
Months employed	
Mean	8.8
Minimum	1
Maximum	12
Percentage employed year-round	41.3%
Mean weeks employed	36.5
Households	
Number	76.0
Employed	
Number	65.6
Percentage	86.3%
Jobs per employed household	
Mean	2.1
Minimum	1
Maximum	7
Employed adults	
Minimum	1
Maximum	5
Mean	
Employed households	1.9
Total households	1.6
Mean person-weeks of employment	66.4

Source ADF&G Division of Subsistence household surveys, 2013.

Table D2-4. – Reported job schedules, Ambler, 2012.

	Jobs		Employed persons		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	78.1	54.3%	72.0	58.8%	43.2	65.9%
Part-time	10.7	7.4%	9.2	7.5%	7.5	11.4%
Shift	13.8	9.6%	13.8	11.3%	11.9	18.2%
On-call (occasional)	39.8	27.7%	35.2	28.8%	28.3	43.2%
Part-time shift	1.5	1.1%	1.5	1.3%	1.5	2.3%
Schedule not reported	0.0	0.0%	0.0	0.0%	0.0	0.0%
Community totals	143.9	100.0%	122.5	64.7%	65.6	83.0%

Source ADF&G Division of Subsistence household surveys, 2013.

Table D2-5. – Resource harvest and use characteristics, Ambler, 2012.

Characteristic	
Number of resources used per household	
Minimum	0
Maximum	41
95% confidence limit (±)	9.8%
Mean	15
Median	14
Number of resources attempted to harvest per household	
Minimum	0
Maximum	35
95% confidence limit (±)	11.9%
Mean	10
Median	9
Number of resources harvested per household	
Minimum	0
Maximum	35
95% confidence limit (±)	12.5%
Mean	9
Median	8
Number of resources received per household	
Minimum	0
Maximum	34
95% confidence limit (±)	13.4%
Mean	8
Median	6
Number of resources given away per household	
Minimum	0
Maximum	34
95% confidence limit (±)	16.2%
Mean	6
Median	4
Household harvest (pounds)	
Minimum	0
Maximum	17,892
Mean	2,243.0
Median	934.6
Total estimated harvest weight (pounds)	170,467.9
Community per capita estimated harvest (pounds)	603.4
Percentage of households using any resource	98.1%
Percentage of households attempting to harvest any resource	96.2%
Percentage of households harvesting any resource	96.2%
Percentage of households receiving any resource	92.5%
Percentage of households giving away any resource	86.8%
Number of households in sample	53
Number of resources available	117

Source ADF&G Division of Subsistence household surveys, 2013.

Table D2-6. – Estimated harvest of salmon and nonsalmon fish for consumption by dogs, Ambler, 2012.

Resource	Amount	Pounds
Salmon		
Chum salmon	415.8 ind	2,363.3 lb
Whitefishes		
Sheefish	198.2 ind	2,207.9 lb
Humpback whitefish	645.3 ind	1,355.1 lb
Broad whitefish	1,231.2 ind	3,939.8 lb
Nonsalmon fish		
Northern pike	4.3 ind	14.2 lb
Total	**2,494.8 ind**	**9,880.3 lb**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D2-7. – Estimated large land mammal and gray wolf harvest by month and sex, Ambler, 2012.

	Black bear	Brown bear	Caribou			Moose			Dall Sheep	Gray wolf
Harvest month	Unknown	Unknown	Male	Female	Unknown	Male	Female	Unknown	Unknown	Unknown
February	0.0	0.0	1.4	11.5	0.0	0.0	0.0	0.0	0.0	8.6
March	0.0	0.0	0.0	71.7	0.0	0.0	0.0	0.0	0.0	2.9
April	0.0	1.4	0.0	20.1	4.3	0.0	1.4	0.0	2.9	0.0
May	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	18.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	0.0	0.0	78.9	0.0	2.9	4.3	0.0	0.0	0.0	0.0
September	8.6	0.0	266.7	10.0	8.6	5.7	0.0	0.0	0.0	0.0
October	0.0	0.0	81.7	25.8	0.0	0.0	0.0	0.0	0.0	0.0
November	0.0	0.0	2.9	14.3	0.0	1.4	0.0	0.0	0.0	1.4
December	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	0.0	0.0
January	0.0	0.0	0.0	30.1	0.0	0.0	0.0	0.0	0.0	5.7
Unknown	0.0	0.0	25.8	0.0	0.0	0.0	0.0	1.4	0.0	1.4
Total harvest	**8.6**	**1.5**	**476.1**	**193.6**	**15.8**	**11.5**	**1.4**	**1.4**	**2.9**	**20.1**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D2-8. – Estimated small land mammal and furbearer harvests by month, Ambler, 2012.

	Estimated harvest by month												
Resource	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Unk
Beaver	0.0	0.0	31.5	28.7	28.7	0.0	2.9	0.0	0.0	0.0	0.0	0.0	23.7
Arctic fox	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
Red fox	4.3	7.2	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.9	0.0
Alaska hare	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
Snowshow hare	11.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	7.2	8.6	11.5
River (land) otter	0.0	0.0	0.0	2.9	5.7	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0
Lynx	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.9	0.0
Marmot	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
Marten	5.7	5.7	5.7	0.0	0.0	0.0	0.0	0.0	0.0	1.4	11.5	1.4	15.8
Mink	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0
Muskrat	0.0	0.0	4.3	17.2	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Porcupine	0.0	1.4	1.4	0.0	0.0	0.0	0.0	1.4	1.4	0.0	0.0	0.0	7.2
Arctic ground (parka) squirrel	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
Weasel	1.4	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gray wolf	8.6	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	5.7	1.4
Wolverine	4.3	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Total harvest	**35.8**	**24.4**	**48.8**	**48.8**	**48.8**	**0.0**	**2.9**	**1.4**	**1.4**	**18.6**	**24.4**	**24.4**	**69.6**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D2-9. – Estimated marine mammal harvest by month, Ambler, 2012.

	Estimated harvest by month												
Resource	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Unk
Bearded seal	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ringed seal	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
Spotted seal	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 seal	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
Walrus	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
Beluga whale	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
Bowhead whale	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
Total harvest	**0.0**	**0.0**	**0.0**	**0.0**	**1.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D2-10. – Estimated bird harvest by season, Ambler, 2012.

	Estimated harvest by season				
Resource	Winter	Summer	Spring	Fall	Season unknown
Bufflehead	0.0	0.0	0.0	0.0	0.0
Canvasback	0.0	0.0	1.4	0.0	0.0
Common eider	0.0	0.0	0.0	0.0	0.0
Unknown eider	0.0	0.0	0.0	0.0	0.0
Goldeneye	0.0	0.0	17.2	0.0	0.0
Harlequin duck	0.0	0.0	7.2	0.0	0.0
Mallard	0.0	0.0	87.5	14.3	0.0
Long-tailed duck	0.0	0.0	67.4	0.0	0.0
Northern pintail	0.0	0.0	70.3	14.3	0.0
Scaup	0.0	0.0	21.5	0.0	0.0
Black scoter	0.0	2.9	45.9	0.0	0.0
Surf scoter	0.0	0.0	21.5	2.9	0.0
White-winged scoter	0.0	0.0	0.0	0.0	0.0
Northern shoveler	0.0	0.0	21.5	0.0	0.0
Green-winged teal	0.0	0.0	20.1	0.0	0.0
Wigeon	0.0	0.0	47.3	7.2	0.0
Unknown ducks	0.0	0.0	5.7	0.0	0.0
Brant	0.0	0.0	0.0	0.0	0.0
Canada goose	0.0	0.0	153.4	17.2	0.0
Emperor goose	0.0	0.0	0.0	0.0	0.0
Snow goose	0.0	0.0	12.9	0.0	0.0
White-fronted goose	0.0	0.0	206.5	0.0	0.0
Unknown goose	0.0	0.0	0.0	0.0	0.0
Tundra swan	0.0	0.0	0.0	0.0	0.0
Sandhill crane	0.0	0.0	0.0	0.0	0.0
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0
Unknown loon	0.0	0.0	0.0	0.0	0.0
Unknown seabirds	0.0	0.0	0.0	0.0	0.0
Grouse	7.2	8.6	0.0	47.3	0.0
Ptarmigan	418.7	0.0	11.5	2.9	0.0
Total harvest	**425.9**	**11.5**	**818.8**	**106.1**	**0.0**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D2-11. – Reasons for less household uses of resources compared to recent years, Ambler, 2012.

	Reasons for less use as compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Large land mammals		Marine mammals		Birds and eggs		Vegetation		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Family or personal	1	2.9%	1	3.4%	0	0.0%	1	6.7%	0	0.0%	3	17.6%	2	8.3%	4	17.4%
Resource availability	2	5.9%	2	6.9%	1	33.3%	0	0.0%	1	7.7%	3	17.6%	11	45.8%	3	13.0%
Resources too far	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
No equipment/equipment problems	3	8.8%	2	6.9%	0	0.0%	8	53.3%	0	0.0%	3	17.6%	2	8.3%	9	39.1%
Did not receive	4	11.8%	1	3.4%	2	66.7%	1	6.7%	8	61.5%	4	23.5%	1	4.2%	2	8.7%
Did not try/low effort	7	20.6%	4	13.8%	0	0.0%	0	0.0%	1	7.7%	1	5.9%	3	12.5%	2	8.7%
Unsuccessful (unlucky)	1	2.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Weather/environment	19	55.9%	19	65.5%	0	0.0%	3	20.0%	0	0.0%	1	5.9%	10	41.7%	12	52.2%
Other	1	2.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	4.2%	0	0.0%
Working/not enough time	4	11.8%	3	10.3%	0	0.0%	1	6.7%	1	7.7%	2	11.8%	1	4.2%	1	4.3%
Regulations	1	2.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Resources too small/diseased	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	5.9%	1	4.2%	0	0.0%
Did not get enough	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	7.7%	1	5.9%	0	0.0%	0	0.0%
Did not need	1	2.9%	1	3.4%	0	0.0%	3	20.0%	1	7.7%	0	0.0%	1	4.2%	2	8.7%
Did not give any away	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Too expensive (fuel)	0	0.0%	1	3.4%	1	33.3%	1	6.7%	1	7.7%	1	5.9%	0	0.0%	1	4.3%
Use other resources	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, 2013.

Table D2-12. – Resources of which households reported needing more, Ambler, 2012.

Resource	Households needing	Percentage of households responding
Unknown	3	8.3%
All resources	2	5.6%
Fish	3	8.3%
Salmon	5	13.9%
Chum salmon	21	58.3%
Nonsalmon fish	5	13.9%
Burbot	1	2.8%
Sheefish	3	8.3%
Trout	2	5.6%
Whitefishes	2	5.6%
Broad whitefish	1	2.8%
Humpback whitefish	1	2.8%
Land mammals	2	5.6%
Black bear	1	2.8%
Caribou	12	33.3%
Moose	2	5.6%
Marine mammals	2	5.6%
Unknown seal	10	27.8%
Bowhead whale	2	5.6%
Birds and eggs	1	2.8%
Ducks	1	2.8%
Northern pintail	1	2.8%
Geese	2	5.6%
Ptarmigan	2	5.6%
Crabs	2	5.6%
King crab	1	2.8%
Berries	6	16.7%
Blueberry	13	36.1%
Lowbush cranberry	1	2.8%
Salmonberry	2	5.6%

Table D2-13. – Reported impact to households responding that they did not get enough of a resource, Ambler, 2012.

		Households not getting enough _____ .				Impact to those not getting enough _____ .									
	Sample	Valid responses		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	53	45	84.9%	26	57.8%	0	0.0%	2	7.7%	9	34.6%	9	34.6%	6	23.1%
Nonsalmon fish	53	49	92.5%	16	32.7%	0	0.0%	0	0.0%	5	31.3%	4	25.0%	7	43.8%
Marine invertebrates	53	5	9.4%	3	60.0%	0	0.0%	1	33.3%	2	66.7%	0	0.0%	0	0.0%
Large land mammals	53	52	98.1%	15	28.8%	0	0.0%	0	0.0%	3	20.0%	6	40.0%	6	40.0%
Marine mammals	53	36	67.9%	14	38.9%	0	0.0%	3	21.4%	4	28.6%	5	35.7%	2	14.3%
Birds and eggs	53	38	71.7%	10	26.3%	0	0.0%	3	30.0%	3	30.0%	2	20.0%	2	20.0%
Vegetation	53	52	98.1%	21	40.4%	0	0.0%	3	14.3%	5	23.8%	4	19.0%	9	42.9%
All resources	53	52	98.1%	19	36.5%	0	0.0%	0	0.0%	4	21.1%	2	10.5%	13	68.4%

Source ADF&G Division of Subsistence household surveys, 2013.

Table D2-14. – Things households reported doing differently as the result of not getting enough of a resource, Ambler, 2012.

				Used more		Used other		Asked				Increased				Obtained food		Got public			
	Valid	Bought/bartered		commercial foods		subsistence foods		others for help		Made do without		effort to harvest		Got a job		from other sources		assistance		Other	
	responses	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	16	2	12.5%	5	31.3%	4	25.0%	0	0.0%	2	12.5%	0	0.0%	0	0.0%	0	0.0%	2	12.5%	1	6.3%
Nonsalmon fish	13	1	7.7%	2	15.4%	6	46.2%	0	0.0%	0	0.0%	1	7.7%	0	0.0%	0	0.0%	2	15.4%	1	7.7%
Marine invertebrates	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%	0	0.0%
Large land mammals	12	0	0.0%	8	66.7%	0	0.0%	2	16.7%	0	0.0%	1	8.3%	0	0.0%	0	0.0%	0	0.0%	1	8.3%
Marine mammals	4	1	25.0%	0	0.0%	1	25.0%	0	0.0%	2	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	3	0	0.0%	3	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	12	0	0.0%	8	66.7%	1	8.3%	1	8.3%	1	8.3%	1	8.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
All resources	15	1	6.7%	7	46.7%	1	6.7%	2	13.3%	0	0.0%	3	20.0%	0	0.0%	0	0.0%	1	6.7%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2013.
Note households were able to give more than one response.

Table D2-15. – Reasons for more household use of resources compared to recent years, Ambler, 2012.

	Reasons for more use as compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Large land mammals		Marine mammals		Birds and eggs		Vegetation		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increased availability	0	0.0%	1	20.0%	0	0.0%	1	14.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Used other resources	0	0.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Good weather	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Received more	0	0.0%	1	20.0%	0	0.0%	3	42.9%	4	80.0%	2	100.0%	0	0.0%	2	50.0%
Needed more	1	50.0%	0	0.0%	0	0.0%	2	28.6%	0	0.0%	0	0.0%	3	50.0%	1	25.0%
Increased effort	1	50.0%	1	20.0%	0	0.0%	1	14.3%	0	0.0%	0	0.0%	2	33.3%	1	25.0%
Got more help	0	0.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	16.7%	0	0.0%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%
Regulations	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Traveled farther	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Increased success	0	0.0%	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Needed less	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Store-bought too expensive	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Had more equipment	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, 2013.

Table D2-16. – Survey comments, Ambler, 2012.

The following comments are those that some repondents chose to write in the space provided for comments or concerns at the end of the survey.

Sport fish license needed for subsistence fishing with rod and reel. Spring moose hunt badly missed—shifted use to sport hunters rather than subsistence users. They don't need moose in the fall, they need it in the spring, so now they need more freezers and there are more people taking more moose.

[Concerned that road will have a negative impact on subsistence, but will hopefully provide jobs, and an incentive for job skills development in Ambler, and an incentive for students to stay in school and graduate from high school.]

It's good to have a road but it will affect hunting. Prices might drop benefit. Some concern about what might happen if the road opens. More people hunting. Don't want to see hunting affected by increase[d] access.

We need help with gas prices and always running out.

Although respondent did not harvest or receive very much, she does go to relative's house fairly regularly to eat wild foods. Her freezer is not large enough to receive many wild foods, but she gets enough.

Respondent supports road, but is concerned about effects on caribou migration.

Should keep the way it is now because of subsistence wise.

Effort to set yourself up for hunting especially getting gas preparation part of process. Team/crew like a whaling crew—everyone has a specialty. Have a driver/captain for caribou hunting, a shooter who kills as quickly and cleanly as they can. Overall concern is if road goes in and caters to mining, how will that affect this area? Big concern is that young people aren't getting out and doing it, not learning like they should. Is our responsibility to guide younger ones, need to take young people out and teach them. Used to be a normal course of life that young people learned. On LEPC board, has many comments that why do worry at shipping groceries in for emergencies? Nobody cooks anymore. Need to teach people to go back to more subsistence so they're more capable. What are we going to do if kids don't learn, only drink juice and pop and food out of a box.

Been very fortunate with people helping them out and giving food. Don't lack at all foods, especially wild foods.

Does this have to do with our licenses? [No.]

Household is very careful not to intrude on subsistence activities. Completely against road.

Would like to see more locals involved in subsistence advisory councils and as decision-makers (especially Board of Fish, Board of Game).

Against road—going to bring people in and it's really going to affect Ambler. All for the jobs, but don't want to see a road. Rather see a railroad to Golovin—least impact on migration routes and number of people who will impact subsistence resources.

Town needs more gas, cheaper prices at the store way too high cost of food and gas! Used to use birds but doesn't anymore because worried about bird flu.

-continued-

Local license vendors are rarely in town. There needs to be another vendor. Some people are afraid of buying permits online because of fear of giving out credit card info. When Kotzebue office sent a vendor out last fall and spring, that worked well and Fish & Game should do that again.

Cost of living very expensive. Even if you try to make a living, it's not enough. Especially heating oil—biggest problem/struggle. Always short of food too. Any help they can get, it would be nice. Some people do alcohol—blow their money on it. It's the most severe problem. It hurts families—violence and they spend their money. Always have some Native food and that helps. Serious food insecurity.

Warmer than usual El Nino all the time more and more anyway jet stream brings hi air too warm. Strange bugs in Selawik. Don't need as much firewood because it's so warm. Muskrat "died out" about 3 years ago. Trade caribou for muktuk with Pt. Lay.

People in Ambler would rather receive. Just let things go by when it's close by. Then say they're needy—especially young families. Too much receiving. There's a lot of resource, if they would get up and get them. Only elders should be receiving. Lots of resources around.

Their lot is above Ambler, worried about that. Lots of fish there in spring. How far is road going to go? Worried about how lot will be affected if the road crosses above it (it's near bormite Ambler River). "Store-bought foods don't taste right."

That mine opening there's going to be chemicals running into streams and rivers. Global warming is changing things hard to set net ice is late. Harder to go out because of gas, store is expensive. Regulations—license, boat license and registration too much. Paperwork and collect locally easier and more accurate.

Wish we had more gas to gather food. That's been our problem for many years. Because the town is out of gas. Both road and subsistence can coexist. (Illegible) Mammals will cross roads it's just throughway. Once road what kind of traffic will be on it? That's what affect it. Animals have no place to go. Everywhere selling off. Trading off progress. It's the start of the depletion of our land. Things will be cheaper but problem. Rather not see the road. Losing either way. High costs, we are the lowest voice. Our leaders are not leading. That's the problem. They say I can't say anything [be]cause another tribe. People not the power, but the people keep it to themselves. This village needs a lot of help. It's a good place to be. Needs to start working together.

Ambler River and Kobuk River are used for hunting. Putting the mining project will intervene with fishing and hunting water will get contaminated.

Good fishing and good hunting—some areas have had big trouble with caribou. The gas and stove oil situation is terrible. We have the resources but need the gas. Expensive is a problem, none is a disaster.

Gas is always a problem. Right now we could go out, but I can't get gas. I am willing to go out for those who don't have a snowmachine, but I don't. Food is available out there, but there is always a problem with gas.

Send some, tell Lupus Harris Maneluk, send seal oil. Caribou won't pass the road. Animals won't be (come) close to here and lots of hunters will use the game. Worried about the caribou. They already said they'll make a road. Worried about the fishing too. Worried about everything, hunting places. She grew up the old way around here.

Don't know enough about the project. Went to a hearing, but don't know.

Table D3-1. – Birthplaces of household heads, Shungnak, 2012.

Residence of parents of households heads	residence of household head Shungnak
Ambler	4.3%
Delta Junction	1.4%
Fairbanks	1.4%
Kiana	1.4%
Kobuk	2.9%
Kotzebue	2.9%
Selawik	2.9%
Shungnak	65.7%
Other U.S.	17.1%

Source ADF&G Division of Subsistence household surveys, 2013.

Table D3-2. – Comparison of median income in dollars, Shungnak, 2012.

	Median[a]	Range[b,c]
2012 Subsistence Division estimate	$50,091	$39,148–$61,171
2008–2012 ACS (Shungnak city)	$50,000	$42,693–$57,307
2008–2012 ACS (All Alaska)	$69,917	$69,179–$70,655

Sources ADF&G Division of Subsistence household surveys, 2013; American Community Survey (ACS) 5-year average results (2008–2012).
a. 2012 Subsistence Division estimate does not include categories of income excluded by the 2008–2012 ACS median estimate, including food stamps, housing assistance, and one-time payments.
b. Range is a 95% confidence interval of the estimated median.
c. ACS Data range is the reported margin of error.

Table D3-3. – Employment characteristics, Shungnak, 2012.

Characteristic	Community Shungnak
All adults	
Number	176.5
Mean weeks employed	17.8
Employed adults	
Number	90.3
Percentage	51.2%
Jobs	
Number	103.9
Mean	1.2
Minimum	1
Maximum	2
Months employed	
Mean	8.2
Minimum	2
Maximum	12
Percentage employed year-round	37.0%
Mean weeks employed	34.7
Households	
Number	69.0
Employed	
Number	54.9
Percentage	79.5%
Jobs per employed household	
Mean	1.8
Minimum	1
Maximum	4
Employed adults	
Minimum	1
Maximum	4
Mean	
Employed households	1.6
Total households	1.3
Mean person-weeks of employment	53.6

Source ADF&G Division of Subsistence household surveys, 2013.

Table D3-4. – Reported job schedules, Shungnak, 2012.

	Jobs		Employed persons		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	75.6	73.8%	68.7	77.4%	50.2	91.4%
Part-time	15.1	14.8%	11.7	13.2%	11.0	20.0%
Shift	1.7	1.6%	1.7	1.9%	1.6	2.9%
On-call (occasional)	8.4	8.2%	8.4	9.4%	7.8	14.3%
Part-time shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
Schedule not reported	1.7	1.6%	1.7	1.9%	1.6	2.9%
Community totals	102.5	100.0%	88.8	51.2%	54.9	76.1%

Source ADF&G Division of Subsistence household surveys, 2013.

Table D3-5. – Resource harvest and use characteristics, Shungnak, 2012.

Characteristic	
Number of resources used per household	
Minimum	2
Maximum	27
95% confidence limit (±)	9.1%
Mean	13
Median	12.5
Number of resources attempted to harvest per household	
Minimum	1
Maximum	23
95% confidence limit (±)	13.7%
Mean	7
Median	5
Number of resources harvested per household	
Minimum	1
Maximum	23
95% confidence limit (±)	14.2%
Mean	7
Median	5
Number of resources received per household	
Minimum	0
Maximum	22
95% confidence limit (±)	11.9%
Mean	8
Median	6
Number of resources given away per household	
Minimum	0
Maximum	20
95% confidence limit (±)	17.2%
Mean	5
Median	3.5
Household harvest (pounds)	
Minimum	1
Maximum	8,493
Mean	1,461.9
Median	828
Total estimated harvest weight (pounds)	100,872.3
Community per capita estimated harvest (pounds)	367.5
Percentage of households using any resource	100.0%
Percentage of households attempting to harvest any resource	100.0%
Percentage of households harvesting any resource	100.0%
Percentage of households receiving any resource	97.8%
Percentage of households giving away any resource	87.0%
Number of households in sample	46
Number of resources available	104

Source ADF&G Division of Subsistence household surveys, 2012.

Table D3-6. – Estimated harvest of salmon and nonsalmon fish for consumption by dogs, Shungnak, 2012.

Resource	Amount	Pounds
Salmon		
Chum salmon	802.3 ind	4,559.6 lb
Whitefishes		
Humpback whitefish	30.0 ind	63.0 lb
Least cisco	450.0 ind	450.0 lb
Sheefish	252.4 ind	2,812.2 lb
Nonsalmon fish		
Lake trout	1.5 ind	6.0 lb
Northern pike	3.0 ind	9.9 lb
Dolly Varden	3.1 ind	10.1 lb
Arctic grayling	4.8 ind	4.3 lb
Total	**1,547.1 ind**	**7,915.1 lb**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D3-7. – Estimated large land mammal and gray wolf harvest by month and sex, Shungnak, 2012.

	Black bear	Brown bear	Caribou			Moose			Dall sheep	Gray wolf
Harvest month	Unknown	Unknown	Male	Female	Unknown	Male	Female	Unknown	Unknown	Unknown
February	0.0	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	3.0
March	0.0	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0
April	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
May	0.0	0.0	0.0	7.5	0.0	0.0	0.0	0.0	0.0	0.0
June	1.5	0.0	0.0	7.5	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	0.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
September	1.5	0.0	88.5	4.5	0.0	4.5	0.0	0.0	0.0	0.0
October	0.0	0.0	49.5	13.5	0.0	0.0	0.0	0.0	0.0	0.0
November	0.0	0.0	6.0	0.0	6.0	0.0	0.0	0.0	0.0	3.0
December	0.0	0.0	4.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0
January	0.0	0.0	4.5	1.5	0.0	0.0	0.0	0.0	0.0	6.0
Unknown	0.0	0.0	47.9	32.9	2.9	0.0	0.0	0.0	0.0	0.0
Total harvest	**3.0**	**0.0**	**281.9**	**104.9**	**8.9**	**4.5**	**0.0**	**0.0**	**0.0**	**12.0**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D3-8. – Estimated small land mammal and furbearer harvest by month, Shungnak, 2012.

	Estimated harvest by month												
Resource	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Unk
Beaver	0.0	0.0	4.5	49.5	0.0	1.5	0.0	9.0	0.0	0.0	0.0	0.0	3.0
Arctic fox	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
Red fox	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
Alaska hare	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
Snowshow hare	0.0	4.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
River (land) otter	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
Lynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0
Marmot	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
Marten	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
Mink	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
Muskrat	0.0	0.0	0.0	25.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Porcupine	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
Arctic ground (parka) squirrel	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
Gray wolf	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	6.0	0.0
Wolverine	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
Total harvest	**3.0**	**4.5**	**15.0**	**75.0**	**0.0**	**1.5**	**0.0**	**9.0**	**0.0**	**3.0**	**0.0**	**7.5**	**3.6**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D3-9. – Estimated bird harvest by season, Shungnak, 2012.

	Estimated harvest by season				
Resource	Winter	Summer	Spring	Fall	Season unknown
Bufflehead	0.0	0.0	0.0	0.0	0.0
Canvasback	0.0	0.0	0.0	0.0	0.0
Common eider	0.0	0.0	0.0	0.0	0.0
Unknown eider	0.0	0.0	0.0	0.0	0.0
Goldeneye	0.0	0.0	0.0	0.0	0.0
Harlequin duck	0.0	0.0	0.0	0.0	0.0
Mallard	0.0	0.0	103.5	0.0	0.0
Long-tailed duck	0.0	0.0	117.0	0.0	0.0
Northern pintail	0.0	0.0	102.0	0.0	0.0
Scaup	0.0	0.0	112.5	0.0	0.0
Black scoter	0.0	0.0	58.5	0.0	0.0
Surf scoter	0.0	0.0	0.0	0.0	0.0
White-winged scoter	0.0	0.0	0.0	0.0	0.0
Northern shoveler	0.0	0.0	0.0	0.0	0.0
Green-winged teal	0.0	0.0	15.0	0.0	0.0
Wigeon	0.0	0.0	15.0	0.0	0.0
Unknown ducks	0.0	0.0	23.0	0.0	0.0
Brant	0.0	0.0	0.0	0.0	0.0
Canada goose	0.0	0.0	166.5	0.0	0.0
Emperor goose	0.0	0.0	0.0	0.0	0.0
Snow goose	0.0	0.0	7.5	0.0	0.0
White-fronted goose	0.0	0.0	207.0	0.0	0.0
Unknown goose	0.0	0.0	0.0	0.0	0.0
Tundra swan	0.0	0.0	0.0	0.0	0.0
Sandhill crane	0.0	0.0	0.0	0.0	0.0
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0
Unknown loon	0.0	0.0	0.0	0.0	0.0
Unknown seabirds	0.0	0.0	0.0	0.0	0.0
Grouse	10.5	0.0	0.0	6.0	0.0
Ptarmigan	91.5	0.0	46.5	0.0	3.1
Total harvest	**102.0**	**0.0**	**974.0**	**6.0**	**3.1**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D3-10. – Reasons for less household use of resources than in recent years, Shungnak, 2012.

	Reasons for less use as compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Large land mammals		Marine mammals		Birds and eggs		Vegetation		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Family or personal	2	7.7%	1	4.0%	1	100.0%	1	10.0%	1	10.0%	0	0.0%	2	10.5%	2	11.1%
Resource availability	0	0.0%	0	0.0%	0	0.0%	1	10.0%	1	10.0%	1	10.0%	2	10.5%	2	11.1%
Resources too far	0	0.0%	0	0.0%	0	0.0%	2	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
No equipment/equipment problems	1	3.8%	1	4.0%	0	0.0%	1	10.0%	0	0.0%	0	0.0%	0	0.0%	2	11.1%
Did not receive	2	7.7%	3	12.0%	0	0.0%	0	0.0%	8	80.0%	2	20.0%	0	0.0%	0	0.0%
Did not try/low effort	2	7.7%	2	8.0%	0	0.0%	2	20.0%	0	0.0%	4	40.0%	4	21.1%	2	11.1%
Unsuccessful (unlucky)	1	3.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Weather/environment	16	61.5%	17	68.0%	0	0.0%	2	20.0%	1	10.0%	0	0.0%	9	47.4%	13	72.2%
Other	1	3.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Working/not enough time	4	15.4%	3	12.0%	0	0.0%	1	10.0%	0	0.0%	2	20.0%	8	42.1%	2	11.1%
Regulations	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Resources too small/diseased	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Did not get enough	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	11.1%
Did not need	1	3.8%	0	0.0%	0	0.0%	1	10.0%	0	0.0%		0.0%	1	5.3%	0	0.0%
Did not give any away	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Too expensive (fuel)	0	0.0%	0	0.0%	0	0.0%	2	20.0%	0	0.0%	3	30.0%	0	0.0%	2	11.1%
Use other resources	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, 2013.

Table D3-11. – Reasons for more household use of resources than in recent years, Shungnak, 2012.

	Reasons for more use as compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Large land mammals		Marine mammals		Birds and eggs		Vegetation		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increased availability	1	14.3%	1	33.3%	0	0.0%	5	38.5%	1	16.7%	0	0.0%	5	38.5%	4	25.0%
Used other resources	0	0.0%	0	0.0%	0	0.0%	1	7.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Good weather	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Received more	5	71.4%	1	33.3%	2	100.0%	5	38.5%	5	83.3%	1	25.0%	2	15.4%	8	50.0%
Needed more	1	14.3%	0	0.0%	0	0.0%	1	7.7%	0	0.0%	0	0.0%	1	7.7%	3	18.8%
Increased effort	2	28.6%	0	0.0%	0	0.0%	1	7.7%	0	0.0%	3	75.0%	5	38.5%	3	18.8%
Got more help	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	7.7%	0	0.0%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Regulations	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Traveled farther	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Increased success	0	0.0%	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Needed less	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Store-bought too expensive	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	6.3%
Had more equipment	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, 2013.

Table D3-12. – Resources of which households reported needing more, Shungnak, 2012.

Resource	Households needing	Percentage of households responding
All resources	1	3.6%
Fish	2	7.1%
Salmon	3	10.7%
Chum salmon	14	50.0%
Coho salmon	1	3.6%
Pink salmon	1	3.6%
Burbot	1	3.6%
Sheefish	3	10.7%
Whitefishes	6	21.4%
Broad whitefish	2	7.1%
Humpback whitefish	1	3.6%
Black bear	1	3.6%
Caribou	7	25.0%
Unknown seal	1	3.6%
Ducks	1	3.6%
Teal	1	3.6%
Geese	2	7.1%
White-fronted goose	1	3.6%
Blueberry	8	28.6%
Lowbush cranberry	1	3.6%
Blackberry	1	3.6%
Wild rhubarb	1	3.6%
Unknown mushrooms	1	3.6%
Wood	1	3.6%

Source ADF&G Division of Subsistence household

Table D3-13. – Reported impact to households responding that they did not get enough of a resource, Shungnak, 2012.

		Households not getting enough _____ .				Impact to those not getting enough _____ .									
	Sample	Valid responses		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	46	42	91.3%	19	45.2%	0	0.0%	4	21.1%	9	47.4%	5	26.3%	1	5.3%
Nonsalmon fish	46	40	87.0%	13	32.5%	0	0.0%	0	0.0%	5	38.5%	7	53.8%	1	7.7%
Marine invertebrates	46	2	4.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	46	43	93.5%	5	11.6%	0	0.0%	1	20.0%	3	60.0%	1	20.0%	0	0.0%
Marine mammals	46	34	73.9%	1	2.9%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Birds and eggs	46	34	73.9%	5	14.7%	1	20.0%	1	20.0%	2	40.0%	1	20.0%	0	0.0%
Vegetation	46	43	93.5%	12	27.9%	1	8.3%	2	16.7%	4	33.3%	4	33.3%	1	8.3%
All resources	46	46	100.0%	10	21.7%	1	10.0%	0	0.0%	4	40.0%	5	50.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2013.

Table D3-14. – Things households reported doing differently as the result of not getting enough of a resource, Shungnak, 2012.

	Valid	Bought/bartered		Used more commercial		Used other subsistence foods		Asked others for help		Made do without		Increased effort to harvest		Got a job		Obtained food from other sources		Got public assistance		Other	
	responses	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	10	0	0.0%	5	50.0%	4	40.0%	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	11	0	0.0%	6	54.5%	3	27.3%	1	9.1%	1	9.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	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%	0	0.0%
Large land mammals	3	0	0.0%	3	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	1	1	100.0%	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%
Birds and eggs	2	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	8	0	0.0%	6	75.0%	0	0.0%	0	0.0%	1	12.5%	1	12.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
All resources	9	0	0.0%	7	77.8%	2	22.2%	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, 2013.
Note households were able to give more than one response.

Table D3-15. – Survey comments, Shungnak, 2012.

The following comments are those that some repondents chose to write in the space provided for comments or concerns at the end of the survey.

Having enough fish to feed my family. "Order our food from Anchorage, switched to different." "Cheaper to get it by cases, but still expensive."

Weather is changing. "That's all."

Mine activity road will change, for our subsistence we will have to go way down to get our caribou. Price of gas, high price of food. Creek are populated by beaver to more sickness from beaver. Effecting the whitefish.

Would be good if they can help with cost of living, in gas. The actives they're planning on doing will effect the caribou, moose, the cost of living will get lower, but we'll lose the subsistence.

Once when I was a teenager we didn't get enough fish so we stayed with a family and they shared with us. It was nice. "This is the worst since then." "Kids hardly go out fishing, they're into ipods, cellphones, TV, and computers." "As long as we are in health, that's enough." "When I was a girl at BIA, we would fish as soon as school was out." "I worked at the BIA school once I got older." "I retired from school when I was 68."

Maybe they will help us when we run out of food, need the road, when mining for some people. But I don't know about the road. They will effect little bit. Every summer, white people raft through our river. Some just get antlers, when do they process the food. Leave food some place.

Food security in the town is an issue. Kids generally speaking will tell him they are hungry. Has students who say they are hungry once a week. Every student at this school is on free lunch. And they eat massive amounts of junk. Nutrition is a foreign concept for students. Sees students that had never seen pea pods or where seeds come from. The protein is there, but nothing supplemental to be added to it. "Go to the store and look at their soda aisle?" There's only one way to fix it, a pre-postage questioniare and some money. There is an element of checks being guaranteed for people and the new cords can limit food stamps. Let people know they are mailed in surveys and give out money this way.

My concern would be how a road in the area would affect subsistence activity in the region.

Hunter is watching the mom, so he can't go out to get game.

Seems to be the same, no major problem other than the high water. Fuel costs prevent me from going out, case you can't get to the game. At $10.55/gal how can I afford it.

Worried about young people not learning how to subsistence hunt. Learned while in camp and change a lot. Earth getting old. Getting different. Worried about bad weather. High water, can't get fish. If caribou never come through here we worried.

No fish and now my caribou is gone "I've never run out before and now with no fish, I'm out." I trade dried caribou for seal oil. I can not live out of the store. Have to buy gas before we go out. We always have to buy it. "In Anaktuvuk Pass, elder can get a barrel for $50, here it's $500." "Spent $1500 on Anchorage food and I want to keep ordering to stay on it, but the dividend won't last." "If I don't have to buy wood cause it's warm then I can feed them for two more weeks." "We just cannot afford the prices at the store. " "$1.25 for a candy bar and $10.59 for a gallon." "A loaf of bread is $6.00, white is $4.00." "He has to depend on WIC for the milk, and I really need that for the baby." "Every free program, we need it." "I may be having a hard time and 3 of my sisters came to me when the food stamps run out."

Used to catch thousands of them. Hardly none, a bad summer. No fish. Eating with other families. "The high was the worst." We didn't catch any whitefish last summer.

High cost of food and gas! Concerns about how the road might effect the caribou.

Gas prices too high

-continued-

Worry about nothing later, food not here, that's why I try to gather. *Paniqtuq* , berries, not like before, gather Eskimo food. Not food those days. Eat ptarmigan, rabbit. Snare. Stay in camp, fish put away, do not know how to pick berries or eat what we eat today, everything change. Worried about the younger kids not learning the old ways and how to take care of themselves off the land if they have to.

Quit sending hunters up the Noatak, too much guiding/transporters. Upsetting migration patterns, diverting the herds. Fishing is disturbed by fly-over planes, catch and release fisherman fishing in same locations. Subsistence piece, shouldn't be for sportsman. Kotzebue hunters.

Too many wolves, moose too close to town.

Weather was bad last year. High price of gas.

More wolves, stopping them from moving. The wolf den is a big problem in the back and keeps them in check. People are getting wolves say hopefully the tuttu can take off. Really cold and hard to get food. This year we didn't get enough snow. In the 80s we'd have so much snow you couldn't go in houses. "Migrating good, just that the weather is [?], and we can all see that you know." Hardest months are the winter, it's hard to get food and you have to store as much as you can. "You have to try and make it through the cold months." "Especially when you have little kids and they need food." (100 boats hunting on the Kobuk, by [?] in full time.)

Lot of black bear.

I was worried to let him hunt, my 14 year old. The elders my husband's mom told me I had to let him go out. I could not stop the boys because they are needed. We need them to grow in that role. When they go out to birds, they all shoot and divide the profit. There is no one in the harvesting. They share with elders and divide the rest among every household on the hunt. "See more white-fronted geese." 14 year old would go out and shoot ptarmigan for elders. He harvested 2 for them last year, but now the wolves are too close, we won't let him up the woods alone. "Dad taught him most of it. Gun safety is a huge part of the process. No bullets in the chamber while walking. He's probably even a better shot than me." When you order food you get for 3 months worth. "The Honda is down." -Story title. "Fall harvest, subsistence I worry about now." "If we have the resources." It helps to have some income from cash to make up for the loss of money. I worry about migratory birds, and the surf scoters and other species are being. affected. They should be here. We hardly see them anymore. I think the migration is in the way of the oil spill. I worry about these things.

3 caribou eyed for 15 years. Travel a lot and easy to get. People talk about the mine like it may change the migration because of the noise, not the road. Have seen the Red Dog Mine, and people saying the caribou won't cross the road. If you see them within 300 feet you have to stop and wait. I think the road and mine are a good thing for people, we need more supplies and cheaper gas. $10.59/gallon.

How is climate change going to affect subsistence fishing, hunting, etc.? How will the development of roads and influx of people affect caribou migration. What is being done to make sure that development does not interfere with subsistence hunting and gathering? What are the developers of Bornite Mine doing to minimize their impact on the environment and subsistence activities?

High cost of gas has changed over the years. The nets we have set for fish to catch, seagulls and otters eats the fish, chew the nets. We have to budget now days because the gas is so high here in our town.

Lots of wolves and bears block the caribou migration impacts of these animals. Sometimes they can get held back and then he don't get much caribou.

Students have expressed concern about the road that will be coming into town in the coming years. I'm concerned that it could affect the migratory patterns of the caribou. Seeing how dependent the community is on caribou, a change in migration patterns would have a huge impact on families. I've also heard concerns that the subsistence laws may change and many think that they could starve or wind up in trouble if they continue living the way they do.

Too much rain, which made it hard to catch fish and pick berries.

Table D4-1. – Birthplaces of household heads, Kobuk, 2012.

Residence of parents of households heads	Community of residence of household head
	Kobuk
Barrow	2.2%
Glennallen	4.4%
Kiana	2.2%
Kobuk	48.9%
Kotzebue	4.4%
Noorvik	2.2%
Selawik	2.2%
Shungnak	8.9%
Other U.S.	15.6%
Foreign	2.2%
Missing	4.4%

Source ADF&G Division of Subsistence household surveys, 2013.

Table D4-2. – Comparison of median income in dollars, Kobuk, 2012.

	Median[a]	Range[b,c]
2012 Subsistence Division estimate	$41,878	$37,317–$74,678
2008–2012 ACS (Kobuk city)	$30,313	$13,292–$47,334
2008–2012 ACS (All Alaska)	$69,917	$69,179–$70,655

Sources ADF&G Division of Subsistence household surveys, 2013; American Community Survey (ACS) 5-year average results (2008–2012).
a. 2012 Subsistence Division estimate does not include categories of income excluded by the 2008–2012 ACS median estimate, including food stamps, housing assistance, and one-time payments.
b. Range is a 95% confidence interval of the estimated median.
c. ACS Data range is the reported margin of error.

Table D4-3. – Reported job schedules, Kobuk, 2012.

	Jobs		Employed persons		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full-time	45.8	58.7%	42.6	63.0%	31.0	89.3%
Part-time	18.6	23.8%	18.8	27.8%	14.9	42.9%
Shift	1.2	1.6%	1.3	1.9%	1.2	3.6%
On-call (occasional)	12.4	15.9%	11.3	16.7%	8.7	25.0%
Part-time shift	0.0	0.0%	0.0	0.0%	0.0	0.0%
Schedule not reported	0.0	0.0%	0.0	0.0%	0.0	0.0%
Community totals	78.0	100.0%	67.6	68.0%	34.8	93.3%

Source ADF&G Division of Subsistence household surveys, 2013.

Table D4-4. – Employment characteristics, Kobuk 2012.

	Community
Characteristic	Kobuk
All adults	
Number	99.4
Mean weeks employed	23.4
Employed adults	
Number	67.6
Percentage	68.0%
Jobs	
Number	78.0
Mean	1.2
Minimum	1
Maximum	2
Months employed	
Mean	8.3
Minimum	1
Maximum	12
Percentage employed year-round	35.2%
Mean weeks employed	34.4
Households	
Number	36.0
Employed	
Number	34.8
Percentage	96.6%
Jobs per employed household	
Mean	2.3
Minimum	1
Maximum	5
Employed adults	
Minimum	1
Maximum	5
Mean	
Employed households	1.9
Total households	1.9
Mean person-weeks of employment	66.4

Source ADF&G Division of Subsistence household surveys, 2013.

Table D4-5. – Resource harvest and use characteristics, Kobuk, 2012.

Characteristic	
Number of resources used per household	
Minimum	4
Maximum	34
95% confidence limit (±)	7.0%
Mean	15
Median	14
Number of resources attempted to harvest per household	
Minimum	1
Maximum	31
95% confidence limit (±)	11.2%
Mean	10
Median	8
Number of resources harvested per household	
Minimum	1
Maximum	28
95% confidence limit (±)	11.1%
Mean	9
Median	7.5
Number of resources received per household	
Minimum	1
Maximum	19
95% confidence limit (±)	9.0%
Mean	9
Median	8.5
Number of resources given away per household	
Minimum	0
Maximum	21
95% confidence limit (±)	13.2%
Mean	7
Median	6
Household harvest (pounds)	
Minimum	4
Maximum	8,079
Mean	1,410
Median	755
Total estimated harvest weight (pounds)	50,742.6
Community per capita estimated harvest (pounds)	308.7
Percentage of households using any resource	100%
Percentage of households attempting to harvest any resource	100%
Percentage of households harvesting any resource	100%
Percentage of households receiving any resource	100%
Percentage of households giving away any resource	90%
Number of households in sample	30
Number of resources available	103

Source ADF&G Division of Subsistence household survey, 2012.

Table D4-6. – Estimated use of salmon and nonsalmon fish for consumption by dogs, Kobuk, 2012.

Resource	Amount	Pounds
Salmon		
Chinook salmon	3.6 ind	47.7 lb
Pink salmon	2.4 ind	8.7 lb
Chum salmon	2,110.3 ind	11,993.1 lb
Whitefishes		
Humpback whitefish	18.0 ind	37.8 lb
Broad whitefish	210.0 ind	672.0 lb
Sheefish	318.0 ind	3,542.5 lb
Nonsalmon fish		
Burbot	1.2 ind	5.0 lb
Northern pike	19.2 ind	63.4 lb
Arctic grayling	48.0 ind	43.2 lb
Total	**2,730.7 ind**	**16,413.4 lb**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D4-7. – Estimated large land mammal and gray wolf harvest by month and sex, Kobuk, 2012.

	Black bear	Brown bear	Caribou			Moose			Dall sheep	Gray wolf
Harvest month	Unknown	Unknown	Male	Female	Unknown	Male	Female	Unknown	Unknown	Unknown
February	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
March	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
April	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
May	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
August	2.4	0.0	14.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
September	0.0	0.0	56.4	1.2	8.4	3.6	0.0	0.0	0.0	0.0
October	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0
November	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4
December	0.0	0.0	2.4	9.6	0.0	0.0	0.0	0.0	0.0	6.0
January	0.0	0.0	13.2	8.4	0.0	0.0	0.0	0.0	0.0	8.4
Unknown	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Total harvest	**2.4**	**0.0**	**86.4**	**22.8**	**9.7**	**3.6**	**0.0**	**0.0**	**0.0**	**18.0**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D4-8. – Estimated small land mammal and furbearer harvest by month, Kobuk, 2012.

	Estimated harvest by month												
Resource	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Unk
Beaver	0.0	0.0	6.0	46.8	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.9
Arctic fox	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
Red fox	0.0	1.2	2.4	0.0	0.0	0.0	0.0	0.0	2.4	4.8	1.2	0.0	1.2
Alaska hare	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
Snowshow hare	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6
River (land) otter	0.0	0.0	1.2	0.0	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	0.0	0.0
Marmot	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
Marten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	2.4	2.4
Mink	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
Muskrat	0.0	0.0	2.4	4.8	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Porcupine	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
Arctic ground (parka) squirrel	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
Gray wolf	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	6.0	8.4	0.0
Wolverine	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
Total harvest	**1.2**	**7.2**	**12.0**	**51.6**	**0.0**	**0.0**	**0.0**	**1.2**	**3.6**	**7.2**	**19.2**	**10.8**	**9.1**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D4-9. – Estimated marine mammal harvest by month, Kobuk, 2012.

	Estimated harvest by month												
Resource	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Unk
Bearded seal	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
Ringed seal	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
Spotted seal	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 seal	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
Beluga whale	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
Bowhead whale	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
Total harvest	**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, 2013.

Table D4-10. – Estimated bird harvests by season, Kobuk, 2012.

	Estimated harvest by season				
Resource	Winter	Summer	Spring	Fall	Season unknown
Bufflehead	0.0	0.0	0.0	0.0	0.0
Canvasback	0.0	0.0	3.6	0.0	0.0
Common eider	0.0	0.0	0.0	0.0	0.0
Unknown eider	0.0	0.0	0.0	0.0	0.0
Goldeneye	0.0	0.0	0.0	0.0	0.0
Harlequin duck	0.0	0.0	0.0	0.0	0.0
Mallard	0.0	0.0	77.3	0.0	0.0
Long-tailed duck	0.0	0.0	41.3	0.0	0.0
Northern pintail	0.0	0.0	50.4	0.0	0.0
Scaup	0.0	0.0	27.3	0.0	0.0
Black scoter	0.0	0.0	12.0	0.0	0.0
Surf scoter	0.0	0.0	0.0	0.0	0.0
White-winged scoter	0.0	0.0	0.0	0.0	0.0
Northern shoveler	0.0	0.0	13.2	0.0	0.0
Green-winged teal	0.0	0.0	0.0	0.0	0.0
Wigeon	0.0	0.0	31.2	0.0	0.0
Unknown ducks	0.0	0.0	66.0	0.0	0.0
Brant	0.0	0.0	5.0	0.0	0.0
Canada goose	0.0	0.0	111.9	0.0	0.0
Emperor goose	0.0	0.0	0.0	0.0	0.0
Snow goose	0.0	0.0	0.0	0.0	0.0
White-fronted goose	0.0	0.0	114.0	0.0	0.0
Unknown goose	0.0	0.0	61.2	0.0	0.0
Tundra swan	0.0	0.0	1.2	0.0	0.0
Sandhill crane	0.0	0.0	2.4	0.0	0.0
Unknown shorebirds	0.0	0.0	0.0	0.0	0.0
Unknown loon	0.0	0.0	0.0	0.0	0.0
Unknown seabirds	0.0	0.0	0.0	0.0	0.0
Grouse	0.0	0.0	0.0	46.8	3.3
Ptarmigan	62.4	0.0	24.0	7.2	26.4
Total harvest	**62.4**	**0.0**	**642.0**	**54.0**	**29.7**

Source ADF&G Division of Subsistence household surveys, 2013.

Table D4-11. – Reasons for less household use of resources compared to recent years, Kobuk, 2012.

	Reasons for less use as compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Large land mammals		Marine mammals		Birds and eggs		Vegetation		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Family or personal	1	4.8%	1	5.6%	0	0.0%	1	7.1%	0	0.0%	0	0.0%	1	7.1%	0	0.0%
Resource availability	0	0.0%	0	0.0%	0	0.0%	4	28.6%	1	100.0%	0	0.0%	1	7.1%	3	17.6%
Resources too far	0	0.0%	0	0.0%	0	0.0%	1	7.1%	0	0.0%	0	0.0%	0	0.0%	1	5.9%
No equipment/equipment problems	1	4.8%	2	11.1%	0	0.0%	3	21.4%	0	0.0%	1	25.0%	1	7.1%	4	23.5%
Did not receive	1	4.8%	1	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Did not try/low effort	0	0.0%	1	5.6%	0	0.0%	3	21.4%	0	0.0%	1	25.0%	2	14.3%	1	5.9%
Unsuccessful (unlucky)	0	0.0%	0	0.0%	0	0.0%	1	7.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Weather/environment	18	85.7%	15	83.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	7	50.0%	10	58.8%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Working/not enough time	2	9.5%	1	5.6%	0	0.0%	4	28.6%	0	0.0%	0	0.0%	2	14.3%	3	17.6%
Regulations	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Resources too small/diseased	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Did not get enough	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	1	5.9%
Did not need	1	4.8%	0	0.0%	0	0.0%	1	7.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Did not give any away	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Too expensive (fuel)	0	0.0%	0	0.0%	0	0.0%	1	7.1%	0	0.0%	1	25.0%	0	0.0%	2	11.8%
Use other resources	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, 2013.

Table D4-12. – Reasons for more household use of resources compared to recent years, Kobuk, 2012.

	Reasons for more use as compared to recent years															
	Salmon		Nonsalmon fish		Marine invertebrates		Large land mammals		Marine mammals		Birds and eggs		Vegetation		All resources	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increased availability	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Used other resources	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Good weather	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Received more	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	100.0%	1	100.0%	1	50.0%	1	100.0%
Needed more	0	0.0%	0	0.0%	0	0.0%	1	33.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Increased effort	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%
Got more help	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Regulations	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Traveled farther	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Increased success	0	0.0%	0	0.0%	0	0.0%	2	66.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Needed less	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Store-bought too expensive	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Had more equipment	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, 2013.

Table D4-13. – Resources of which households reported needing more, Kobuk, 2012.

Resource	Households needing	Percentage of households responding
Unknown	6	26.1%
All resources	2	8.7%
Fish	3	13.0%
Salmon	2	8.7%
Chum salmon	13	56.5%
Sockeye salmon	1	4.3%
Sheefish	5	21.7%
Whitefishes	6	26.1%
Large land mammals	2	8.7%
Black bear	1	4.3%
Caribou	4	17.4%
Moose	6	26.1%
Bearded seal	1	4.3%
Birds and eggs	1	4.3%
Ptarmigan	1	4.3%
Berries	7	30.4%
Blueberry	1	4.3%
Lowbush cranberry	1	4.3%
Sourdock	2	8.7%

Source ADF&G Division of Subsistence household surveys, 2013.

Table D4-14. – Reported impact to households responding that they did not get enough of a resource, Kobuk, 2012.

		Households not getting enough _____ .				Impact to those not getting enough _____ .									
	Sample	Valid responses		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	30	28	93.3%	15	53.6%	0	0.0%	0	0.0%	7	46.7%	6	40.0%	2	13.3%
Nonsalmon fish	30	28	93.3%	11	39.3%	1	9.1%	0	0.0%	4	36.4%	5	45.5%	1	9.1%
Marine invertebrates	30	6	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	30	28	93.3%	10	35.7%	1	10.0%	0	0.0%	3	30.0%	5	50.0%	1	10.0%
Marine mammals	30	20	66.7%	2	10.0%	0	0.0%	0	0.0%	1	50.0%	0	0.0%	1	50.0%
Birds and eggs	30	24	80.0%	2	8.3%	0	0.0%	0	0.0%	1	50.0%	1	50.0%	0	0.0%
Vegetation	30	27	90.0%	12	44.4%	3	25.0%	0	0.0%	5	41.7%	2	16.7%	2	16.7%
All resources	30	27	90.0%	16	59.3%	0	0.0%	1	6.3%	1	6.3%	10	62.5%	4	25.0%

Source ADF&G Division of Subsistence household surveys, 2013.

Table D4-15. – Things households reported doing differently as the result of not getting enough of a resource, Kobuk, 2012.

				Used more		Used other		Asked				Increased				Obtained food from		Got public			
	Valid	Bought/bartered		commercial		subsistence foods		others for help		Made do without		effort to harvest		Got a job		other sources		assistance		Other	
	responses	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Salmon	9	0	0.0%	5	55.6%	1	11.1%	0	0.0%	1	11.1%	0	0.0%	2	22.2%	0	0.0%	0	0.0%	0	0.0%
Nonsalmon fish	7	0	0.0%	5	71.4%	2	28.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	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%	0	0.0%
Large land mammals	6	0	0.0%	5	83.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	16.7%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	1	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	1	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	4	0	0.0%	3	75.0%	0	0.0%	0	0.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
All resources	19	1	5.3%	12	63.2%	1	5.3%	2	10.5%	1	5.3%	0	0.0%	1	5.3%	0	0.0%	1	5.3%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2013.
Note households were able to give more than one response.

Table D4-16. – Survey comments, Kobuk, 2012.

The following comments are those that some repondents chose to write in the space provided for comments or concerns at the end of the survey.

Moose hunter coming in from the outside. Too many planes (hunters) buzzing our camps and chasing the moose away.

Just wondering how it will be when the mining continues, or how the road will have an effect on subsistence. Caribou came late this year.

I hope next year we get more meat or fish. I hope they don't put that road in. It will scare the meat away. It already happens. They cruise down the road and it scares the game.

Froze bad. Too shallow in upper Kobuk for under-ice net. I feel secure about the land and trust the land will give me what I need. The road may go up the Maniiluq River—the most beautiful place up here. Caribou movement and water quality are a concern.

Mentioned that this was a bad year to do this project because of low harvests.

If they build road by Kobuk River it would hurt subsistence. It would make fuel more affordable if can haul from Fairbanks and freight. Other ideas—railroad says cost more. It would be better if the railroad. A bear tore up the fish net.

Caribou was late past couple years. Then the big bulls are rutting, so we can only get the small bulls and cows.

My concern is that this data be compared with a normal year because this year was too wet, too much rain. River was high. Cost of heating oil and gas is too high. Hard to do subsistence. The noise from the mine/drilling rigs keep the caribou away during fall harvest time. Used more store food, used more wood because of price of stove oil. Less berries because of too much rain.

Where are they at in the process of the road project when and where start. Last few years the caribou have been migrating differently because of Nova's work. Concerns—less caribou. Have mixed feelings about the project, how bad an impact will it make? Won't know until it's built.

It's hard for teachers (time frame) to get a moose ticket. Worried about the mine and road going in. Afraid the resources will go away.

If don't have a hunting license have to pay [?] The road is going to affect us—the hunting and berries. More guides will come up even if they aren't supposed to. Not sure if want the road, just know it will affect us.

Same as last year—maybe less chum and caribou, but it all equaled out. He says he can always get food and always has enough. He says Alaska can provide food if you know how to hunt and fish.

Worried about the road's effect on caribou. Doesn't know if it will happen—how hard where it will be for children to gather subsistence foods. Road too close to home.

That road would shorten, cut down costs of fuel but there would be too much traffic—the road would be worse than the fly-in hunts. Disapprove of that. Mining, bornite, people complain about the caribou, now are just understanding why we neeed the caribou—but all the helicopter noise is a lot. Once they see 5 caribou they have to shut down the rig. When [?] about caribou—no hunting while going back and forth on road—hard on local workers. Cause we still need the meat. That was wrong to say "hunt because they are there." Especially on river during hunting time go upriver—leave the bones on the sandbars up past Lee's camp.

-continued-

It's better to learn from other people so I stopped doing independent hunting and fishing. Question about road—if they want cheapest route, it costs money to be safe—who says they want spend money to be safe and environmental friendly. Is railroad cheaper to road? Why not go to Red Dog Mine. Kids may go drink and go down road and get lost. Look at Dalton Highway. I don't think they'll have much control if they build it. I think a railroad would be less disturbing to caribou.

Prefer a road over a railroad, I can have a truck and go hunting anywhere. If the caribou are migrating, then stop the trucks when the herd is moving through. They do that now at Bornite. Train is loud when it honks and can hear it far away. Can always tell—the trucks can tell where they are they stop drilling and flying helicopters for a few days when the caribou migrate through.

Interesting

Caribou are affected by mine traffic. Have to go further away off road for berries because of road. I know this road will impact us.

I'd rather not see a road. I'm anti-mine but it would change the face of this place.

Concern—a whole lot of competition for hunting when the road is open. One elder told him about a surveyor was looking around—miner—poisoned a creek (copper is poisonous) and everything was dead the next year.

APPENDIX E–
WESTERN ARCTIC CARIBOU HERD WORKING GROUP LETTER TO GOVERNOR SEAN PARNELL

Western Arctic Caribou Herd Working Group

Goal: To work together to ensure the long-term conservation of the Western Arctic Caribou Herd and the ecosystem on which it depends, to maintain traditional and other uses for the benefit of all people now and in the future.

Chair: Roy Ashenfelter **Vice-Chair: Phil Driver**

April 20, 2012

Governor Sean Parnell
P.O. Box 110001
Juneau, AK 99811-0001

Dear Governor Parnell:

As the State of Alaska evaluates the feasibility of various "Roads to Resources" projects, I would like to submit the following request on behalf of the Western Arctic Caribou Herd Working Group (Working Group). The Working Group is a permanent organization of stakeholders that represent communities within the range of this herd, guides, transporters, environmentalists, nonlocal hunters and reindeer herders. The purpose of this group is to ensure the conservation of the Western Arctic Herd.

We request that:

1. The State of Alaska fund a Community Health Impacts Assessment to identify potential impacts of proposed roads on people and their communities within the range of the Western Arctic Herd. This project could be structured using the Technical Guidance for Health Impact Assessments in Alaska[1] report that identifies health effects categories relevant to Alaskan resource development projects. The Food, Nutrition and Subsistence Activity category (p. 29) appears to address the primary concerns of the Working Group, including:
    a. How changes in wildlife habitat, hunting patterns and food choices will influence the diet and cultural practices of local communities; and
    b. Project-specific impacts that may affect the availability of foods needed by local communities to survive in a mixed cash and subsistence economy in rural Alaska.
2. That no decision be made regarding whether or not to build these roads until the Community Health Impacts Assessment is completed with input from the communities, and the final results provided to potentially affected communities.

Working Group members feel that it is important that the State of Alaska consider projected impacts of new roads on this herd as well as the people who depend upon it. This includes the Ambler Mining District Access Project, the Foothills West Transportation Access project (Umiat) and the Western Alaska Access Planning Study (Nome). The following topics are of primary concern:

1. Road impacts on the Western Arctic Herd, including changes in movements, distribution, and population size in response to infrastructure, disturbance and hunting pressure.

[1] State of Alaska HIA Program, Department of Health and Social Services. July 2011. Technical Guidance for Health Impact Assessment (HIA) in Alaska, v 1.0.

Please Reply To: Caribou Working Group, P.O. Box 175, Nome, AK 99762
With copy of reply sent to 114 S. Franklin St., Ste. 203, Juneau, AK 99801

2. Impacts of roads on hunting access for local residents as well as visiting hunters, including anticipated changes in harvest levels and the complexity of hunting regulations.
3. Social and economic costs/benefits of road access on previously roadless communities, addressing projected changes in reliance on and costs of commercial goods including foods and fuels compared to costs associated with subsistence based culture and economy.
4. We feel that the cumulative effects of all road and development projects within the range of the Western Arctic Herd should be considered in these analyses.

The herd peaked around 2003 at a population size of 490,000 caribou and has since begun to steadily decline. Low population levels, could significantly impact the communities that harvest caribou from this herd. Increased access bringing greater numbers of hunters into traditional subsistence hunting areas could greatly compound the effects of natural fluctuations in caribou abundance.

Working Group members from rural communities want to know how their subsistence activities will be changed if roads are established through their hunting areas. The concerns we have identified in #2 and #3 above are important in determining the social and economic costs of roads on communities. Studies by ADFG on the Nelchina Caribou Herd regulations and harvest history[2] illustrate the challenges of managing hunting in areas that have supported rural subsistence hunters/communities and become accessible to large populations by roads. Restrictions associated with hunting near industrial developments are also a concern. Increased off-road access, including ORVs, boats and snowmachines, may also impact the behavior of the Western Arctic Herd and other species, and make it more difficult for local hunters to obtain the meat they need.

The Working Group is not requesting that a social study be conducted to merely document the effects of roads on subsistence users. That was done long ago[3]. Our objectives are to: 1) attempt to predict specific impacts of the proposed roads on local residents; 2) provide this information to affected communities to allow them to make informed decisions regarding whether or not to build these roads; and 3) decide how to proceed. If it is decided to establish these roads, the information from this project could be used to minimize or mitigate likely impacts. In order to complete this process, the Working Group requests that no decision be made regarding whether to establish these roads until the requested project be completed and its results provided to potentially affected communities.

Thank you for your consideration of our request. We look forward to your response.

Sincerely,

Roy Ashenfelter, Chair

[2] Fall, J.A and W.E. Simeone. 2010. Overview of Nelchina Caribou Herd Regulation and Harvest History. Alaska Department of Fish and Game, Special Publication No. BOG 2010-05.

[3] Wolf, R.J. and R.J. Walker. 1987. Subsistence economies in Alaska: Productivity, geography, and development Impacts. Arctic Anthropology 24(2):56-81.

CC:
Cora Campbell, Commissioner, Alaska Department of Fish and Game
Marc Luiken, Commissioner, Alaska Department of Transportation and Public Facilities
William Streur, Commissioner, Alaska Department of Health and Social Services
Jeff Haskett, Alaska Regional Director, US Fish and Wildlife Service
Sue Masica, Alaska Regional Director, National Park Service
Bud Cribley, Alaska State Director, Bureau of Land Management
Western Arctic Caribou Herd Working Group Members & Alternates

APPENDIX F–GOVERNOR'S REPLY TO WESTERN ARCTIC CARIBOU HERD WORKING GROUP

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Office of Governor Sean Parnell
STATE OF ALASKA

July 3, 2012

Mr. Roy Ashenfelter
Western Arctic Caribou Herd Working Group
P.O. Box 175
Nome, AK 99762

Dear Mr. Ashenfelter,

I write in response to your letter requesting a comprehensive social study on the impacts of large-scale road projects in Interior Alaska and requesting that this information be made available to the public and stakeholder groups in advance of further project developments. I sincerely apologize for the delay in responding to your letter. These issues are very important to our administration, and we remain committed to working with your group to address them.

We agree that it is important to examine, understand, and strive to mitigate potential impacts of development on subsistence resources and the people who depend upon them. Multiple State agencies are engaged in addressing many of the concerns you raise in your letter. The Alaska Department of Fish and Game (F&G) is analyzing satellite and GPS collar data from caribou along the Red Dog road corridor as well as looking at caribou habitat use within the Umiat road corridor. F&G is also present at community meetings regarding these projects and works with local leaders to review data as the project moves forward. They will continue to partner with other departments to communicate data made available through the National Environmental Policy Act (NEPA) and Environmental Impact Statement (EIS) processes.

You may also be aware that the Department of Health and Social Services (HSS) has been conducting Health Impact Assessments (HIAs) since 2010. As it is a relatively new program they are constantly refining their methods and updating the HIA Toolkit. The HIA program's objectives are to anticipate health impacts, to share these impacts with communities, and to involve communities in the decision making process. Their process of gathering data depends heavily on field work in communities and from other experts that study subsistence harvest, but their analysis focuses on the actual consumption of subsistence foods. HIA teams will also address the cultural and social implications of changes to subsistence practices through their direct contact with communities including positive impacts such as well-paying jobs for rural residents and lower costs of goods and services to remote communities.

HSS is currently developing an HIA for the potential road to Umiat, and will likely develop an HIA for the Ambler Road project if that project proceeds to an EIS. Typically, HIAs are conducted as part of the EIS process, so the HIA team can have access to the other baseline data that is collected, such as cultural and socioeconomic information, subsistence data, and environmental information.

Please know that the Parnell Administration remains committed to identifying and assisting communities in understanding potential impacts of large-scale resource development across Alaska. If you would like to speak further about the status of these projects, the IHA program, and current F&G research projects, please feel free to contact John Moller, Governor Parnell's Senior Rural Affairs Advisor at 907-465-3500 to coordinate a meeting.

Sincerely,

Randy Ruaro
Deputy Chief of Staff